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31

Understanding the consumer purchase behaviour towards green electronic products: using insight from the theory of planned behaviour

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Abstract

Purpose – This research investigation aims to explore the factors that affect purchasing behaviour among consumers in India in the context of green electronic products with the aid of the extended theory of planned behaviour (TPB) by incorporating two additional constructs, namely environmental concern and ethical obligation.

Design/methodology/approach – The current research adopted a quantitative methodology, utilising a survey (questionnaire) to gather data from respondents residing in Delhi-NCR, India. A convenience sampling technique was used to select these respondents. Both online and offline modes were used to collect the data. Moreover, to evaluate the theoretical foundation of the investigation, the researchers employed PLS-SEM (partial least square structural equation modelling) on 346 useable samples.

Findings – The outcome reveals that attitude, subjective norm and perceived behaviour control (PBC) are significant predictors, supplementary constructs such as environmental concern are not significant predictors, whereas ethical obligation is a substantial predictor of purchase intention. Consumer purchase behaviour, in turn, is influenced by consumer purchase intention.

Practical implications – The outcome of this research could help the country's legislators formulate policies and programs related to current environmental problems faced by our planet. Marketers could understand the factors that drive consumers' purchasing behaviour towards green electronic products and design effective marketing strategies accordingly. Thus, by enhancing the company's green image, marketers of green products may potentially increase future purchases, all of which contribute to solving worldwide environmental problems.

Originality/value – This research confirms the usefulness of TPB in understanding Indian consumers' purchasing intention and behaviour towards green electronic products. It further extends the TPB by showing that new components, environmental concerns and ethical obligations influence Indian consumers' purchasing intentions and behaviour. Moreover, prior studies mostly used both additional constructs for green products. Current research used specific types of green products, i.e. green electronic products, as very few studies are available on these products that apply TPB, which makes this study novel. In contrast to previous research that primarily examined purchase intention, this study takes a further step by investigating the connection between intentions and consumers' purchase behaviour. It establishes intention as a precursor to behaviour, specifically towards green electronic products. Additionally, this study introduces new constructs and explores the Indian context, significantly contributing to the existing literature.

Keywords Consumer purchase behaviour, Theory of planned behaviour, Green electronic products, Environmental concern, Ethical obligation

Paper type Research paper

1. Introduction

Increased consumption patterns of different types of products confront the world with severe environmental degradation, including the depletion of the ozone layer, greenhouse gas

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emissions, and melting of glaciers. As a result, humans also suffer from severe health problems. This increase in consumption will contribute to a growth in waste, particularly electronic waste, a significant issue facing India today. According to CPCB (2022) rules (Central Pollution Control Board), India is the third biggest global creator of electronic garbage (e-waste). The amount of electronic waste in India rushed-from 708,445.00 tonnes in 2017–18 to 16,01,155.36 million tonnes in 2021–2022. In addition, accompanied by various other waste streams, it exhibits an unparallelled rate of expansion (Singh, Li, & Zeng, 2016; Danish, Ali, Ahmad, & Zahid, 2019). As the global desire for sophisticated products has made the electronic industry extremely lively, novel products are regularly introduced within consumer electronics. At the same time, individuals continually upgrade to fresh apparatus and discard outdated models (Hassan & Nor, 2013). According to Recykal (2022), the informal sector in India handles 95% of electronic waste illegally. The "informal waste collectors," known as scrap dealers, disregard environmental regulations and burn e-waste that cannot be recycled or diverted from landfills, potentially causing severe ecological damage and health risks. These e-wastes require unique treatment, disposal, and recycling methods to mitigate their effect on the ecosystem (Danish *et al.*, 2019). However, these are not permanent solutions. A more effective method is needed to address the issue of e-waste: one that involves the removal of toxic substances and adopting environmentally friendly practices, such as green electronics (Misra, Kumar, & Jain, 2021). Electric appliances and gadgets that use less energy are known as "green electronic" products. When used or discarded, these electrical devices cause little or no environmental damage (Mandawala & Gamage, 2019). Due to these reasons, green products have become prominent in recent years. These products address several environmental issues, including preserving resources (such as energy and water), minimal pollution, non-toxicity, and recyclability (Sun, Wang, Gao, & Li, 2018). According to Rahnama and Rajabpour (2017), these products are more energy-efficient than conventional products since they utilise energy from renewable sources. It contains components that are harmless to the environment and have minimal environmental impacts (Gallagher & Muehlegger, 2011; Borin, Cerf, & Krishnan, 2011). These products are superior to traditional non-green products in every stage, including manufacture, consumption, and disposal (Dangelico & Pontrandolfo, 2010; Kaur, Gangwar, & Dash, 2022). Moreover, this necessitates immediate action to alter consumers' preferences, diverting them from traditional electronics and towards green electronics to mitigate the adverse impact of these products on our ecosystem (Tao *et al.*, 2017). Environmental preservation and minimising waste are paramount to environmentally conscious consumers (Wu, Guo, Huang, Liu, & Xiang, 2018; Ali, Ashfaq, Begum, & Ali, 2020). Nowadays, consumers exhibit a greater inclination to participate actively in the preservation of the environment, while their conduct is inclined towards practices that are environmentally friendly and ecologically sound (Liu, Liu, & Mo, 2020). As consumers play a pivotal role in accelerating these terrible environmental problems, the responsibility ultimately lies in their purchasing behaviour in the market, specifically in their decision to opt for environmentally friendly or non-environmentally friendly products. Those consumers determined to safeguard the environment for human survival consistently purchase products with minimal adverse environmental effects during usage and disposal. Every action to protect the environment holds significance, collective effort truly counts. Adopting the practice of acquiring products that support the well-being of our planet is a remarkable demonstration of such an effort (Patharia, Rastogi, Vinayek, & Malik, 2020). By purchasing green electronics, consumers can help create a greener environment for future generations. However, comprehending the critical aspects that impact consumer behaviour regarding green electronics is of immense importance. The utilisation of the TPB is shown to be extremely useful in this particular case, as numerous past studies embraced TPB to explore consumer behaviour towards green products in an extended form (Chaudhary, 2018; Varah, Mahongnao, Pani, & Khamrang, 2021; Kumar, 2021; Niloy, Sultana, Alam, Ghosh, & Farhan, 2023). This research also applies

the extended TPB for investigating consumer behaviour by adding two additional constructs: environmental concern and ethical obligation. Adding these constructs to the well-established TPB framework strengthens the theory's explanatory power and helps understand how Indian consumers behave about green electronics.

Previous research studies provide evidence that a heightened level of concern for the environment stimulates the promotion of environmentally friendly purchase intention (Ahmed *et al.*, 2020; Yue, Sheng, She, & Xu, 2020; Aslam, Farhat, & Arif, 2020; Moslehpour *et al.*, 2023). In line with this, the present study also utilised environmental concerns to predict consumer purchase intention. People with a deep sense of consciousness towards the environment are more likely to prioritise the ecological aspects of products above all other attributes when they decide to purchase. This growing inclination to buy environmentally friendly products is reflected in the increasing number of individuals prioritising environmental concerns when purchasing (Majeed, Ahmed, & Rasheed, 2022). Furthermore, ethical responsibility also significantly shapes an individual's ethical behaviour (Kumar *et al.*, 2023). This moral imperative influences ethical consumers, driven by a strong obligation towards others, in their purchasing decisions (Shaw, Shiu, & Clarke, 2000).

The current investigation begins, by thoroughly examining previous studies on consumer behaviour toward green products. It uncovers a notable gap in the available research concerning green electronic products in India. The essence of this study is firmly rooted in the expanded TPB proposed by Ajzen (1991), which serves as a potent tool for anticipating consumer purchasing patterns. To enhance the efficacy of this research, two more constructs, environmental concern and ethical obligation, have been incorporated into the TPB model. The uniqueness of this research lies in elucidating the various factors that shape consumer purchasing behaviour towards green electronic products, as the existing body of research in this specific domain is still in its nascent stage in India. The present study has two objectives. Firstly, it examines the impact of three constructs of TPB (AT, SN, PBC) and two additional constructs (EC and EO) on PI. Furthermore, it also examines the impact of PI on PB toward green electronic products in the context of Indian consumers.

This study employed a survey research method, utilising a structured questionnaire tool to collect data from the target population to test the hypothesis. Validated scales from previous research were used to measure the study's variables (AT, SN, PBC, EC, EO, PI, and PB). Statistical analysis, including partial least squares structural equation modelling, was conducted to examine the relationships between these variables. The findings of this study indicate a positive correlation between AT, SN, PBC, and EO with PI, and the relationship of EC with PI is not significant. The relationship between PI and PB is also positive.

The subsequent structure of this study is as follows: Section 1 provides an introduction, section 2 presents the theoretical background, and a literature review is included in section 3. The research methodology is elaborated in section 4, and the results and analysis are in section 5. Section 6 contains a discussion, conclusion and implications, while limitations and future directions are in section 7. Finally, the article ends.

2. Theoretical background

2.1 Theory of planned behaviour

The notion of planned behaviour theory is an extension of Fishbein and Ajzen's theory of reasoned action (Ajzen, 1980). The critical distinction between the two theories lies in incorporating perceived behavioural control. Ajzen noted this addition in 1991 due to the limited predictive capability of the theory of reasoned action in explaining behaviour. The TPB has been applied across multiple disciplines, including sociology, psychology, and social psychology, to forecast human behaviour (Emekci, 2019). The TPB is widely recognised as

the most useful framework for predicting intention and behaviour. Intention itself is influenced by three factors: attitudes, subjective norms, and perceived behavioural control. On the other hand, this theory considers intention as the best indicator of human behaviour.

The present research used the TPB to assess the factors that impact consumer purchasing behaviour. Previous researchers widely utilised this theory, adding various components to this framework, specifically regarding green products such as organic food, energy-saving appliances, and electric vehicles (Kamalanon, Chen, & Le, 2022; Ahmed *et al.*, 2020; Shalender & Sharma, 2020; Hossain, Fekete-Farkas, & Nekmahmud, 2022; Shah, Modi, Muduli, & Patel, 2023). Accordingly, this study utilises the TPB as the theoretical framework to validate the influence of several factors on consumers' purchasing intention and behaviour toward green electronic products. As there is limited literature on these products that rarely adopt TPB, this study tries to contribute to the literature related to green electronics by adopting this theory in an extended form to fill this gap.

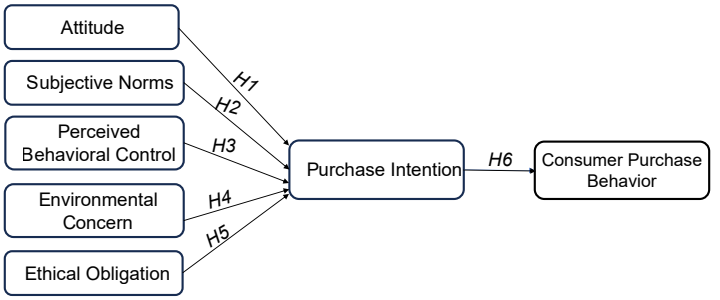
2.2 Proposed extended TPB model

Prior researchers have utilised the Theory of Planned Behaviour on a larger scale to forecast consumer purchasing behaviour in an extended format (Hameed, Waris, & Amin ul Haq, 2019; Chen & Gou, 2022; Chen *et al.*, 2022; Kamalanon *et al.*, 2022; Niloy *et al.*, 2023). As a result, the current study also incorporates two critical variables, environmental concerns and ethical obligations, as an extension of the classic TPB model to examine consumer purchase behaviour towards green electronic products. Several studies have added consumers' environmental concerns due to their significance in predicting purchasing intention. For example, Hossain *et al.* (2022) surveyed energy-saving appliances. Shukla (2019) discuss millennials' intention to purchase green products in India. Varah *et al.* (2021) on young consumers' intentions towards green products. Ahmed *et al.* (2020), in respect of organic food. Each research provides compelling evidence for including environmental concerns in the original TPB model. Besides the environmental concern, the TPB framework also incorporates the ethical obligation of consumers. According to Beck and Ajzen (1991), ethical obligation enhances the predictive power of the TPB. Moreover, due to their essential role in shaping consumers' purchasing intention toward green products, this construct was added to TPB in various studies, such as those by Arli, Tan, Tjiptono, and Yang (2018), to explore consumers' purchase intention toward green products. Kumar *et al.* (2023) for modelling environmentally conscious purchase behaviour. Similarly, Shaw *et al.* (2000) conducted a study on the role of ethical obligation and self-identity in the theory of planned behaviour. The additional variables improve the model by examining consumer purchase intentions and behaviour in a developing country, India when purchasing green electronic products. This research framework, grounded in TPB theory, evaluates the interconnections among the extended constructs within the domain of green electronic products. This makes the study both theoretically and contextually unique. Figure 1 illustrates the hypothesised research model.

3. Literature review

3.1 The determinants of the extended TPB model

3.1.1 Attitude. "Previous studies provide significant evidence of the importance of this anterior variable (Shalender & Sharma, 2020). A person's attitude can be defined as their approval or disapproval of an action (Ajzen, 1985). According to the theory of planned behaviour, an individual's execution of a specific behaviour is influenced by their intention to carry out that behaviour. The intention is influenced by the individual's perceptions of their ability to engage in target behaviour successfully, subjective norms regarding such



Source(s): Authors' creation

Figure 1. Hypothesized research model

behaviour, and attitudes toward it (Ajzen, 1991). This indicates that consumers are almost sure to buy products, which is advantageous for the environment when they hold a positive attitude towards environmental conservation and vice versa. Moreover, a study by Tsen, Phang, Hasan, and Buncha (2006) demonstrates that consumer perception significantly affects the purchasing decision of environmentally friendly products. Therefore, consumers need to have knowledge and awareness of the environment before purchasing such products (Kamalanon *et al.*, 2022). Notably, there has been limited investigation into the relationship between AT and PI in the context of green electronic products, which is the novelty of this study. However**,** multiple studies have identified positive and statistically significant effects of consumers' attitudes on purchase intentions for green products (Arli *et al.*, 2018; Akroush, Zuriekat, Al Jabali, & Asfour, 2019; Liu *et al.*, 2020; Aslam *et al.*, 2020; Ahmed *et al.*, 2020; Kumar *et al.*, 2023; Khan, Hameed, & Akram, 2023; Khan, Khan, Nabi, Khanam, & Arwab, 2023). Meanwhile, Zhang, Fan, Zhang, and Zhang (2019) conducted a study on different types of green products, energy-saving household appliances and organic clothing, revealing a positive and significant relationship between attitude and purchase intention for both green products. Similarly, the study conducted by Liao, Wu, and Pham (2020) on green products depicts the positive relationship between the abovementioned variables in Cambodia. Another survey by Sun and Wang (2020) also provides the same outcome in China to understand consumers' intention to purchase green products. The same results were found in the Indian context: Varah *et al.* (2021) studied consumers' intention toward green products, Shukla (2019) examined millennials' intention to purchase green products, Taufique and Vaithianathan (2018) investigated the ecological consumer behaviour of young urban Indian consumers, whereas Shalender and Sharma (2020) aimed to forecast the inclination to embrace electric vehicles in India. Based on the above discussion and evidence provided by previous empirical investigations, it can be concluded that there is a robust correlation between attitude and purchase intention. This is because more favourable consumer attitudes result in a higher purchasing intention to purchase green products. Thus, it is hypothesised that:

H1. Attitude positively influences purchase intention towards green electronic products.

3.1.2 Subjective norm. "Subjective norms measure the degree to which an individual is influenced by their peers to conform to a specific behaviour." (Ajzen, 1991). Park (2000) states that people's most essential and close-knit social networks, including their family, friends, and co-workers, shape their subjective norms (Paul, Modi, & Patel, 2016; Emekci, 2019). According to the theory of planned behaviour, the subjective norm is the second important factor influencing an individual's intention towards any action. It can be described as the perceived societal pressure to conform to socially acceptable behaviour (Ajzen, 1991).

Moreover, society's perception influences consumers' feelings towards a product, affecting their decision to purchase it. As members of social groups, consumers hear about products, discuss them, and learn what others believe about their acceptability (Dholakia, Bagozzi, & Pearo, 2004). When environmentally conscious people are in close contact with the consumer, there is a high probability that they will buy ecologically friendly products. Most prior research has demonstrated that the subjective norm is a crucial predictor of purchase intention (Arli *et al.*, 2018; Lee & Chow, 2020; Ahmed *et al.*, 2020; Carrión Bósquez, Arias-Bolzmann, & Martínez Quiroz, 2023; Liu *et al.*, 2020; Khan, Hameed *et al.*, 2023; Khan, Khan *et al.*, 2023). Evidence also proves that consumers' subjective norms favourably impact their intention to purchase energy-saving products (Waris & Ahmed, 2020; Hossain *et al.*, 2022; Harun, Fauzi, & Sulaiman, 2022). Studies conducted in the Indian context also found similar results in the purchase intention of green products (Shukla, 2019; Varah *et al.*, 2021). Contrary to these studies, few showed insignificant results between the abovementioned variables (Paul *et al.*, 2016; Kamalanon *et al.*, 2022; Kumar *et al.*, 2023; Bulsara & Trivedi, 2023). Therefore, based on the theoretical framework of TPB and past empirical research on green products, it can be concluded that subjective norms significantly influence consumers' purchasing intentions. Both theoretical framework and empirical evidence clearly show that subjective norms have a broad and significant influence in shaping consumers' intentions. Thus, it can be hypothesised that:

H2. Subjective norm positively influences purchase intention toward green electronic products.

3.1.3 Perceived behavioural control. Perceived behavioural control constitutes the TPB's last and most crucial component for influencing intention. According to this theory, generating perceived behavioural control is important for developing the intention. When individuals do not have total free will over the action in question, "the notion of perceived behavioural control has been added to deal with such situations" (Ajzen, 2002). Ajzen (1991) states that "the perceived ease or difficulty of exhibiting particular behaviour" is one definition of perceived behavioural control. Klöckner (2013) asserts that perceived behavioural control measures an individual's inclination and ability to carry out a behaviour. If an individual has both the ability and the inclination to perform a particular action rather than just one or the other, the likelihood of the action being executed increases (Zhou, Thøgersen, Ruan, & Huang, 2013). Within the framework of this study, if the consumers possess the requisite resources—time, expertise, financial means, and drive—to acquire green products, defined as products with a reduced environmental footprint, the intention to purchase that product becomes greater. Moreover, PBC's relationship with the purchase intention toward green electronic products has not been studied much in the literature. This research tried to fill this gap by testing the relationship between PBC and PI toward green electronic products. However, several previous studies are available investigating the relationship between PBC and PI in different types of green products. For example, studies on energy-efficient products, depict that consumers' intention to use energy-saving gadgets to reduce energy consumption is significantly impacted by their perceived behavioural control (Tan, Ooi, & Goh, 2017; Waris & Ahmed, 2020; Hossain *et al.*, 2022; Harun *et al.*, 2022). However, a large body of literature on green products has also illustrated similar results outside India (Arli *et al.*, 2018; Ahmed *et al.*, 2020; Ruangkanjanases *et al.*, 2020; Liu *et al.*, 2020; Aslam *et al.*, 2020; Khan, Hameed *et al.*, 2023; Khan, Khan *et al.*, 2023). Furthermore, in the Indian context, studies also depict the same result between the abovementioned variables (Shukla, 2019; Kumar *et al.*, 2023; Bulsara & Trivedi, 2023). Therefore, based on the theoretical foundation and empirical evidence from earlier studies on green products, it can be inferred that there is a strong association between PBC and PI. PBC is the belief in one's capability to engage in a specific behaviour, which influences the likelihood of actually performing that behaviour and

cultivating a favourable intention to purchase related to that behaviour. Thus, the hypothesis can be formulated as follows:

H3. Perceived behavioural control positively influences purchase intention toward green electronic products.

3.1.4 Environmental concern. Environmental concern is fundamental to ecological research and consumer decision-making (Liao, Shen, & Shi, 2020; Ahmed *et al.*, 2020). Environmental concern pertains to individuals' level of awareness and personal dedication to effectively address environmental challenges. (Paul *et al.*, 2016; Cachero-Martinez, 2020). Consumers who care more about environmental problems are more likely to take steps to protect the environment. Environmental awareness increases the possibility of acquiring environmentally safe products (Bhattacharyya & Cummings, 2014; Kalafatis, Pollard, East, & Tsogas, 1999; Ahmed *et al.*, 2020). Therefore, the proposition that environmental concern directly influences purchase intentions presupposes that environmentally conscious consumers can form such intentions even without knowing the characteristics of the various ecologically friendly purchase options (Newton, Tsarenko, Ferraro, & Sands, 2015). Higher environmental concerns may increase the impact of pleasure on behavioural purposes (Cachero-Martinez, 2020). Previous studies have shown that environmental concerns positively and significantly influence consumer purchase intention. (Prakash & Pathak, 2017; Ahmed *et al.*, 2020; Yue *et al.*, 2020; Moslehpour *et al.*, 2023). Contrary to these studies, some studies outside India showed insignificant results between EC and PI (Tan *et al.*, 2017; Harun *et al.*, 2022; Hossain *et al.*, 2022). A similar insignificant result was also found in the Indian context (Chaudhary, 2018; Chaudhary & Bisai, 2018). Based on the pieces of evidence provided by previous literature, the hypothesis formulated as follows:

H4. Environmental concern positively influences purchase intention towards green electronic products.

3.1.5 Ethical obligation. In consumer behaviour, ethical obligation acts as a significant indicator of individual ethics, reflecting one's behaviour regarding what is considered morally right or wrong. It represents "an individual's internalised ethical principles that reflect personal convictions regarding appropriate conduct." Shaw *et al.* (2000) argue that including ethical responsibility improves comprehension of essential requirements in consumers' intricate decision-making processes. Furthermore, ethical consumers bear more significant ethical duties than others, impacting their purchasing decisions (Shaw & Clarke, 1999). Those consumers with a robust conscience are more inclined to opt for products that harm Mother Earth less. This implies that consumers with more substantial ethical obligations are more likely to endorse environmentally conscious actions, such as recycling and purchasing green products (Arli *et al.*, 2018; Shaw *et al.*, 2000). Prior research has demonstrated the direct impact of ethical obligation on the intention to purchase (Shaw *et al.*, 2000; Shaw & Shiu, 2002; Sandve & Øgaard, 2014). Furthermore, multiple studies have emphasised that ethical responsibility indirectly influences the desire to purchase (Oh & Yoon, 2014; Arli *et al.*, 2018; Kumar *et al.*, 2023). From the above explanation and prior research, it can be inferred that an ethically obligated individual feels responsible for behaving in morally upright and advantageous manners, including caring for the environment. They prefer buying eco-friendly products to reduce the adverse effects on the environment, support sustainable methods, safeguard public health, and contribute to a more favourable future. Therefore, it can be hypothesised that:

H5. Ethical obligation positively influences purchase intention toward green electronic products.

3.1.6 Purchase intention. According to the TPB, purchase intention is believed to be a direct precursor of behaviour. (Ajzen, 2002). It refers to an individual's commitment and readiness to enrol in a particular activity, frequently driven by attitude and subjective norms. Higher degrees of responsibility would likely increase the likelihood of the behaviour being performed (Ajzen, 1988). The research conducted by Fishbein and Ajzen (1975) suggests that a cognitive intention to purchase, which is developed based on favourable attitudes and beliefs about the object, is a reliable predictor of actual purchasing behaviour. Ajzen (1991) posits that intention is the most immediate determinant of behaviour, with stronger intentions leading to a higher likelihood of engaging in the behaviour. Multiple studies have supported a robust and affirmative correlation between purchase intention and consumer purchasing behaviour (Askadilla & Krisjanti, 2017; Yadav & Pathak, 2017; Chaudhary, 2018; Apipuchayakul & Vassanadumrongdee, 2020; Rausch & Kopplin, 2021). Similarly, an investigation performed by Patharia *et al.* (2020) shows that the variables mentioned above are positively and significantly related to each other in green electronic products. Another survey of energy-efficient products also depicts the same results (Hossain *et al.*, 2022). Based on previous literature, it can be hypothesised that:

H6. Purchase intention positively influences purchase behaviour toward green electronic products.

4. Methodology

4.1 Measures

This study used a structured questionnaire for data collection based on earlier research. The structured questionnaire is a tool used to collect data in a quantitative research design. The current study conducted survey research, where the structured questionnaire was the main instrument for collecting data. There were two sections to the entire questionnaire. The first section covered the demographic profile of the consumers, while the next encompassed constructs-related items. Each component of the construct was evaluated on a 5-point Likert scale. Strong disagreement was denoted by a score of 1, disagreement by 2, neutrality by 3, agreement by 4, and strong agreement by 5; as researchers suggested, this scale increases the response rate and response quality while decreasing respondent frustration, and it was used in various previous studies (Ahmed *et al.*, 2020; Bulsara & Trivedi, 2023; Kumar *et al.*, 2023).

According to Kumar *et al.* (2023) as well as Shaw and Shiu (2002), the 3-item scale was used to test "Ethical obligation". 4-item used to measure "Environmental concern" were adopted from Lee (2008), a 3-item scale to measure "Attitude", 4-item scale to measure "Subjective norm," and a 5-item scale to test "Perceived behavioural control" adopted from Paul *et al.* (2016), 4 item scale to measure "Purchase intention" were adopted from Hsu, Chang, and Yansritakul (2017). A 4-item scale to measure "consumer purchase behaviour" were adopted from Lee (2010).

4.2 Data collection and sampling

The methodology employed for data collection in the present study was a structured questionnaire; this is the best tool for collecting functional responses, as it was used in several previous studies (Alagarsamy, Mehrolia, & Mathew, 2021; Hossain *et al.*, 2022; Bulsara & Trivedi, 2023). A convenient sampling technique was employed to select the sample. This non-probability approach was chosen because it allows for rapid completion of the sample frame within a limited time (Salkind & Rainwater, 2009). It was adopted in various previous studies (Emekci, 2019; Khanam & Tarab, 2022; Khan, Hameed *et al.*, 2023; Khan, Khan *et al.*, 2023). In addition, studies related to the area of green marketing, or environmental

marketing, also collected data with the help of this sampling technique (Ritter, Borchardt, Vaccaro, Pereira, & Almeida, 2015; Chekima, Wafa, Igau, Chekima, & Sondoh, 2016; Yadav & Pathak, 2017; Arli *et al.*, 2018; Hossain *et al.*, 2022; Sondhi, Chawla, & Iqbal, 2023). Each of these studies provides strong evidence in support of utilising this approach. The sample for the current study was determined based on convenience, as it was essential to directly engage with knowledgeable individuals who are aware of and purchase green electronic products. Random sampling frames, databases, or records were not accessible; thus, this approach was utilised. The specified sample may be considered representative of the Delhi-National Capital Region; considering the motivational factors for green electronic product purchase intention and purchase behaviour, the sample can provide appropriate data due to its size, composition, and collection context. Moreover, people who are easily accessible are included in this group of samples. For this investigation, 400 questionnaires were distributed online and offline to respondents residing in Delhi NCR (National Capital Region), including university students, government employees, private school employees, and individuals in shopping malls. Importantly, all respondents willingly and voluntarily took part in the survey. Moreover, all questionnaires were sent in English. Out of 400, only 360 questionnaires were returned due to unanswered or inaccurately filled questions; the final data sample consisted of 346 respondents. The current study focused on gathering data from educated individuals who had completed at least a high school education, as previous research has indicated that educated individuals tend to have more insight into green consumer behaviour (Paul *et al.*, 2016; Zhang *et al.*, 2019; Kumar *et al.*, 2023; Mishra & Kulshreshtha, 2023). Furthermore, it has deliberately targeted young and educated consumers due to their heightened awareness of contemporary environmental issues and their ability to consider their selection of green products, as demonstrated by past research (Varah *et al.*, 2021; Tan, Ojo, & Thurasamy, 2019; Bulsara & Trivedi, 2023). The focus was the young, educated demographic as they were more likely to offer valuable insights about environmental matters than the uneducated population.

4.3 Respondent's profile

Hair, Anderson, Babin, and Black (2010) suggested criteria for calculating the sample size were used in this study. They recommended a ratio of 5 to 10 responses for each question. A minimum of 270 samples was needed, considering all 27 items. 400 questionnaires were provided to individuals who consented to participate in the research; 346 were valid responses, which met the sample size criteria and increased the dependability of the results. We received 86.5% of the total responses. The participants' demographic information is as follows:

Concerning gender, a comparatively more significant proportion of replies were obtained from males (n = 192, 55.491%). Regarding participants' academic qualifications, most were from higher education (n = 169,48.843), followed by Postgraduation (n = 130, 37.572%). Regarding participants' ages, most belong to the age category "up to 30" (n = 284,82.080%). Regarding participants' monthly income, most earn below 29,999 per month (n = 252, 72.832%), followed by 30,000–59,999 (n = 79, 22.832%). The demographic information of participants is provided in Table 1.

5. Results and analysis

5.1 Measurement model

In this study, the model has been evaluated using structural equation modelling in conjunction with PLS. To measure the main variables of the suggested model, PLS-SEM (partial least square-SEM) was utilised for data analysis in place of covariance-based SEM (CB-SEM) techniques (Lohmöller, 2013). PLS-SEM was chosen for its distinctive ability to

Characteristics	Frequency	Percentage (%)
Gender		
Male	192	55.491
Female	154	44.508
Age(years)		
Up to 30	284	82.080
31 to 40	43	12.427
41 to 50	14	4.046
51 and above	5	1.445
Income		
Below 29,999	252	72.832
30,000–59,999	79	22.832
60,000–89,999	10	2.890
90,000-above	5	1.445
Education		
Higher education	169	48.843
Post-graduation	130	37.572
Graduation	38	10.982
Intermediate	6	1.734
High school	3	0.867
Profession		
Student	272	78.612
Private service	38	10.982
Business profession	21	6.069
Govt service	15	4.335

Table 1.
Demographics profile

Source(s): Authors' calculation

account for all covariance in the data, allowing for simultaneous analysis of correlation, shared variance, path coefficient, and significance when testing for main effects. (Bollen, 1989; Tzang, Chang, & Chang, 2021). This method is also helpful for evaluating more complicated model structures, small sample sizes, non-normal data, and structural indicators and facilitating theory building (Ebrahimi *et al.*, 2022; Vinzi, Trinchera, & Amato, 2010). The current study, employed PLS-SEM, as it is the superior statistical method for small sample sizes (Chin, Marcolin, & Newsted, 2003) and non-normal data. Furthermore, when determining the association between measurement items and constructs, PLS-SEM is more adaptable than CB-SEM (Li, Du, & Long, 2020; Hair *et al.*, 2021; Sarstedt *et al.*, 2020; Purwanto, 2021). Although this method was used by the previous studies (Hossain *et al.*, 2022; Aslam *et al.*, 2020; Kamalanon *et al.*, 2022).

Table 2 shows adequate measurements, with composite reliability scores between 0.815 and 0.855. These numbers are higher than the 0.70 criterion that Gefen, Straub, and Boudreau (2000) and Nunnally and Bernstein (1994) recommended, demonstrating the robustness of the data. Second, the AVE shows the extent of shared representation between items and constructs that were extracted, and it is an important metric. Every component of the measurement model has an AVE value of more than 0.50, above the cut-off point proposed by Hair, Sarstedt, Hopkins, and Kuppelwieser (2014). By comparing the square root of AVE with construct correlation. The discriminant validity was evaluated using Fornell & Larcker's (1981) methodology. As can be observed in Table 3, each AVE construct possesses a square root greater than the maximum correlation, as stated by Farrell (2010). The results of the convergent and discriminant validity tests meet the stipulated criteria and confirm the adequacy of the measurement model.

Construct	Item	Standardised factor loading	VIF	Cronbach's alpha (α)	Convergent validity Composite reliability	Convergent validity Average variance extracted (AVE)
Attitude	AT1	0.816	1.509	0.745	0.849	0.653
	AT2	0.74	1.506			
	AT3	0.864	1.447			
Subjective norms	SN1	0.815	1.523	0.745	0.855	0.663
	SN2	0.847	1.641			
	SN3	0.779	1.382			
Perceived	PBC1	0.782	1.15	0.725	0.846	0.654
Behavioural	PBC2	0.91	2.2			
Control	PBC3	0.892	2.2			
Environmental	EC1	0.716	1.263	0.776	0.815	0.597
concern	EC2	0.859	1.32			
	EC3	0.736	1.395			
Ethical	EO1	0.745	1.434	0.794	0.822	0.607
obligation	EO2	0.746	1.477			
	EO3	0.842	1.242			
Purchase	PI1	0.80	1.458	0.742	0.853	0.659
intention	PI2	0.796	1.478			
	PI3	0.839	1.49			
Consumer	PB1	0.81	1.535	0.745	0.855	0.664
Purchase	PB2	0.867	1.723			
Behaviour	PB3	0.764	1.374			

Source(s): Authors' calculation

Table 2. Descriptive analysis and measurement model

	AT	EC	EO	PB	PBC	PI	SN
AT	0.808						
EC	0.465	0.773					
EO	0.479	0.356	0.779				
PB	0.282	0.248	0.432	0.815			
PBC	0.531	0.253	0.557	0.29	0.809		
PI	0.393	0.297	0.635	0.529	0.485	0.812	
SN	0.45	0.318	0.37	0.368	0.42	0.396	0.814

Source(s): Authors' calculation

Table 3. Discriminant validity

5.2 The path analysis and structural model

When evaluating the structural equation model, elements such as path coefficient (β) analysis, evaluation of collinearity, and R^2 values (ranging from 0 to 1, representing complete prediction accuracy) are considered. Variance inflation factors (VIFs) effectively depict multicollinearity issues (Ting, Fam, Hwa, Richard, & Xing, 2019). The absence of multicollinearity is confirmed by Table 2, which displays VIF values ranging from 1.15 to 2.2, much below the required threshold of 3.300. A 5,000 resampling bootstrapping approach was utilised to analyse path coefficients. In general, the findings from the framework for analysis indicate that the coefficient of determination (R^2) accounts for 53.9% of the variance in predicting consumers' intention and 51.8% in consumer purchase behaviour toward green

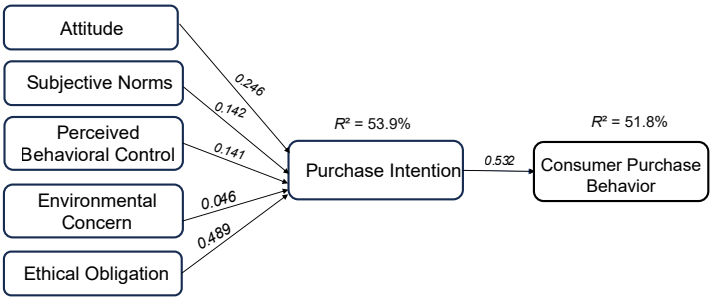
electronic products. The tested research model with a standardised estimate from PLS-SEM is presented in Figure 2. Hypothesis significance levels and path coefficients are; attitudes positively influenced the purchase intention towards green electronic products. ($\beta = 0.246$, $t = 2.14$, $p < 0.049$); the link between subjective norm and purchase intention toward green electronic products was also positive ($\beta = 0.142$, $t = 2.45$, $p < 0.015$); perceived behavioural control influences purchase intention toward green electronic products was also highly significant ($\beta = 0.141$, $t = 2.615$, $p < 0.009$); effect of environmental concern on purchase intention was not substantial ($\beta = 0.046$, $t = 0.796$, $p < 0.427$), the ethical obligation has high impact on purchase intention ($\beta = 0.489$, $t = 8.963$, $p < 0.000$); and purchase intention positively influences consumers' purchase behaviour toward green electronic products ($\beta = 0.532$, $t = 12.423$, $p < 0.000$). The result of the hypotheses is tabulated in Table 4.

6. Discussion

6.1 Discussion of the result and conclusion

To examine consumers purchasing behaviour towards green electronic products, this study applies and expands the TPB by summing up two more constructs: environmental concern and ethical obligation.

The study findings indicate that attitudes toward consumers' purchasing intentions were positive and statistically significant. This finding is evident in prior research examining the propensity to buy energy-efficient electronic products (Hossain *et al.*, 2022; Waris & Ahmed, 2020; Zhang *et al.*, 2019; Shah *et al.*, 2023). The study by Shalender and Sharma (2020) on the acceptance of electric vehicles in India also supports this conclusion. Another study in the



Source(s): Authors' creation

Figure 2.
Tested research model

Hypotheses	Beta	SD	*p*-values	*t*-value	Decision
AT→ PI	0.246	0.062	0.049	2.14	Accept
SN→ PI	0.142	0.058	0.015	2.45	Accept
PBC→ PI	0.141	0.054	0.009	2.615	Accept
EC→ PI	0.046	0.057	0.427	0.796	Reject
EO→ PI	0.489	0.055	0.00	8.963	Accept
PI→ PB	0.532	0.043	0.00	12.423	Accept

Note(s): AT = Attitude; SN = Subjective norms; PBC = Perceived behavioural control; EC = Environmental concern; EO = Ethical obligation; PI = Purchase Intention; PB = Purchase behaviour
Source(s): Authors' calculation

Table 4.
Hypotheses assessment summary

context of India related to purchasing intention for green foods also depicts the same result (Bulsara & Trivedi, 2023). Current and prior literature has demonstrated that attitude significantly influences consumers' purchasing intentions, particularly regarding environmentally friendly products. The assertion that attitude influences purchasing intention is verified by the TPB, which was introduced by Ajzen (1991) and provides unambiguous evidence that attitude is a substantial determinant in establishing the intention to buy green electronic products. Therefore, it is imperative for companies operating in the green market to employ efficient communication tactics to educate consumers about the ecological advantages associated with green electronic products, with the ultimate goal of persuading them to maintain a favourable viewpoint. As a result, these beliefs assist consumers in developing a cheerful disposition towards acquiring these products. Consequently, consumer spending will contribute to mitigating the current adverse environmental conditions.

This study exposed a significant correlation between purchase intention toward green electronics and their subjective norms. This agrees with prior research on environmentally friendly and energy-efficient electronic products (Harun *et al.*, 2022; Hossain *et al.*, 2022; Waris & Ahmed, 2020). Shamsi, Anwar, Chaudhary, Akhtar, and Ahmad (2023) found similar results when studying circular textile products. Therefore, marketing managers must build environmentally friendly electronics in a manner that not only entices more buyers but also leaves a great impression on them. This, in turn, encourages them to share this positive experience with their friends and family. As a result, they play a pivotal role in preventing more environmental pollution. Within the scope of this research, consumers perceive the endorsement of influential individuals as crucial when making purchasing decisions. Their acquaintances, relatives, and social circles influence them to incentivise consumers to purchase environmentally friendly electronics. To tackle the present environmental challenges, these "significant others" roles are crucial in transforming this concern into a collective effort. Policymakers should additionally formulate interventions emphasising recommended actions and actions to avoid and raise awareness among consumers. They can also create distinct campaigns that clearly illustrate the harmful consequences of certain habitual behaviours, utilising "influential figures" such as celebrities and athletes, etc.

Another finding reveals that the perceived behavioural control favourably influences the intention to acquire green electronic products. This outcome was also observed in prior research related to energy-efficient electronic products (Harun *et al.*, 2022; Hossain *et al.*, 2022; Waris & Ahmed, 2020; Zhang *et al.*, 2019; Shah *et al.*, 2023). Another study by Liu *et al.* (2020) confirmed the same outcome, demonstrating that PBC positively influences Chinese consumers' purchasing intention. This research shows that consumers are more likely to purchase green electronics when given the chance and the means to do so. In India, the green consumer base and available range of green electronic products are still in the early stages. Therefore, marketers must invest more in research and development to increase offerings for green choices and make these products easily accessible, thereby increasing the likelihood that prospective consumers may convert into paying ones. In this way, they may help support the environmental movement in which almost every nation is involved in the current scenario.

The current research findings indicate that the link between environmental concern and purchase intention was insignificant. These outcomes contradict the previous research conducted by Moslehpour *et al.* (2023) on Taiwanese customers and Ahmed *et al.* (2020) regarding organic products on Chinese customers. However, the result of this study aligns with the prior research on energy-efficient products outside India (Hossain *et al.*, 2022; Harun *et al.*, 2022; Tan *et al.*, 2017). There are few studies in the Indian context that show insignificant results between the variables above. The study was conducted by Chaudhary

(2018) in the Indian context to determine green purchasing intention among young, educated consumers. The outcome of this study shows that increased environmental concern is not positively correlated with purchasing intention. Another by Chaudhary and Bisai (2018) on the green purchase behaviour of millennials in India also depicts a similar result. Based on these studies, it is fair to say that Indian consumers are conscious of various environmental challenges, such as health problems, climate change, and worsening air quality. However, concern for their environment will unlikely result in purchase intentions toward green electronic products. Several reasons contribute to this; one reason could be that educated individuals in India exhibit environmental concerns but not enough to influence the intention to purchase. Another reason is a need for more confidence in the effectiveness of such products; the price may affect their purchase intention. In conclusion, consumers are aware of the severity of environmental problems but still, more environmental concern is needed to form purchase intentions concerning green electronic products.

Moreover, the study also indicated that ethical obligation and intention to purchase, are positively related. This result contradicts the previous findings on modelling environmentally conscious purchase behaviour (Kumar *et al.*, 2023). However, this result is consistent with the prior research conducted by Arli *et al.* (2018) about environmentally friendly products within the Indonesian setting. Another study also depicts the same result in exploring the influence of ethical obligation on (corporate social responsibility) CSR-related choices by Sandve and Øgaard (2014). This demonstrates the significance of ethics for persons who aim to protect their environment from the existing dire situations when making product purchases. Significantly, consumers' favourable purchase intention is influenced by the sense of ethical obligation generated by marketers' green claims. Consequently, incorporating this construct as an influential factor of TPB constructs supports the advancement of TPB in purchasing green electronic products, thereby enhancing the process of existing literature from the perspective of a developing country, specifically India. Furthermore, it proposes that public interventions should be developed by the government, private sector, entrepreneurs, and marketers to demonstrate how green electronics can contribute to mitigating adverse environmental effects.

Finally, the findings demonstrate that purchase intention and consumer purchase behaviour positively correlate when buying green electronic products. This finding is corroborated by prior research regarding energy-saving products (Hossain *et al.*, 2022; Kamalanon *et al.*, 2022). A study related to sustainable food consumption of green products was explored by Aslam *et al.* (2020) along the same lines. Similarly, Emekci (2019) shows the same result regarding consumers' green consumption behaviours. Within the Indian setting, research conducted by Alagarsamy *et al.* (2021) on sustainable food logistics practices also depicted the same outcome. Based on the present and past research results, it can be inferred that consumers' positive purchasing intentions ultimately impact their prospective purchasing behaviour. The present study furnishes crucial insights for marketers regarding the circumstances that can either weaken or strengthen the association between intentions and behaviours. These results also assist manufacturers of electronic appliances in developing strategies that effectively influence consumers' purchasing intentions and subsequent behaviour regarding green electronic products. In addition, policymakers and environmentalists may carve out desperately required policies to ensure a safer environment.

6.2 Implications

6.2.1 Theoretical implication of the study. This investigation incorporates two additional constructs, environmental concern and ethical obligation, into the TPB framework in green

marketing. These constructs offer new insights into the literature and bring to light further investigation. Additionally, this study confirms the reliability of all factors of the original TPB (attitude, subjective norms, and perceived behavioural control) in shaping the intention to acquire and consumer purchase behaviour towards green electronic products. It emphasises the need for more research on this specific category of green products. However, the result did not agree with one additional variable (environmental concern), which is also a vital contribution to the literature that in the case of green electronic products, consumers' concern toward the environment does not result in purchasing intention, and another variable (ethical obligation) found to be significant. Moreover, this study established a positive correlation between purchase intention and purchasing behaviour. Therefore, this study contributes a new insight into the given body of literature on understanding environmentally conscious purchasing habits by clarifying how the purchase intention (PI) and consumer purchasing behaviour (PB) interact, specifically in green electronic products.

6.2.2 Practical implication stemming from this study. This research showcases a variety of practical implications across numerous domains, such as policy-making, marketing techniques, and educational activities. Marketers can derive significant insights from the findings of this study, as it demonstrates the different factors that impact consumers' decisions to purchase green electronics. By comprehending these, marketers can enhance their strategies for communication, emphasising the advantages of environmentally conscious products to consumers. An important finding from the study is that although people show concern for the environment, they frequently hesitate to buy green electronic products, maybe because they need to gain knowledge and confidence in the products' characteristics and advantages. Implementing a strategic communication approach is imperative for overcoming this obstacle and inspiring customers to adopt environmentally responsible decisions. Marketers can utilise this understanding to tailor their communication, closing the gap between consumer awareness and behaviour.

Furthermore, this study enables marketers to integrate the significance of customer feedback into their product customisation efforts. Marketers may enhance the attractiveness of green electronics by actively interacting with consumers and addressing their preferences and concerns, developing products that better meet customer expectations. In addition, the outcome of this research has significant consequences for marketers, but it also has substantial policy ramifications for the government. They can utilise this knowledge to guide efforts in tackling environmental concerns on an enormous scope. Integrating environmental education into the national curriculum can provide students with the necessary information and skills to positively impact environmental sustainability. By fostering a sense of ecological responsibility from a young age, such initiatives can catalyse collective action and promote sustainable behaviour among individuals and communities.

Moreover, the findings of this study could inform corporate sustainability practices, supply chain management, and marketing strategies for companies operating in India. By aligning business objectives with environmental stewardship, companies can meet consumer demand for green electronic products and contribute to broader sustainability goals. However, real-life examples of companies in the Indian market do exist. The effective techniques employed by these companies facilitate consumers' adoption of green electronic products. Companies such as Panasonic by Harit Umang have implemented an environmental awareness program to encourage people to adopt a sustainable lifestyle. This program includes initiatives such as responsible e-waste disposal, promotion of zero plastic waste, and energy-saving products. LG's program is centred around the development of environmentally friendly products and the promotion of sustainable behaviours. They conduct initiatives to promote awareness regarding energy-efficient appliances and recycling outdated devices. Nokia's Recycling Program offers incentives for returning outdated devices and conducts instructional sessions on managing electronic waste. The

prominent businesses advertised offer trade-in programs for outdated electronic devices. Companies such as Amazon India, Flipkart, and Reliance Digital offer a trade-in program that allows users to exchange their old electronic equipment for discounts on new models. Moreover, Apple, HP, and Dell prominently showcase eco-labels and certifications on their products and packaging, such as ENERGY STAR and EPEAT. These labels aid consumers in promptly recognising environmentally friendly electronic devices that meet particular ecological criteria and help simplify well-informed purchasing choices.

Moreover, this study opens avenues for further scholarly inquiry into the complex dynamics of green purchasing behaviour. Researchers can build upon these findings to explore additional variables that may influence consumers' decisions, thereby deepening our understanding of sustainable consumption patterns and informing the development of more effective interventions.

7. Limitation and future direction

Future research should address the various shortcomings of the current study. Initially, the study's limited sample size and restricted geographical coverage in India indicate the necessity of applying the TPB to a more diversified and representative sample across different locations in India. Second, this study focused exclusively on one type of green product, green electronic products, which means that the findings may not be generalisable to other green products such as green cosmetics, LED lights, organic products, green-certified items, recycled goods, organic clothing, and green hotels. Further studies can use a similar framework to explore consumer behaviour toward these green products. Also, this study was conducted within a specific region, and future research could benefit from comparing green consumption patterns between two other countries or areas to gain a broader perspective. Third, this study utilised a cross-sectional research methodology. However, future investigations could employ a longitudinal technique to monitor changes in consumer behaviour over an extended period. Fourth, this study uses a non-probability technique, which is convenient and quick; this method may only partially represent some of the population of interest, potentially limiting the generalisability of the findings. Previous studies used this technique (Arli *et al.*, 2018; Hossain *et al.*, 2022; Sondhi *et al.*, 2023). By considering this limitation, future researchers could use probability sampling, such as simple random, stratified random sampling. Both of these sampling techniques offer valuable insight for future studies. Simple random sampling ensures that every member of the population has an equal opportunity to be chosen, minimising selection bias and resulting in a more representative sample. This enhances the study's findings, makes them more applicable to a broader population, and has the potential to identify trends and patterns that were previously undetected. This approach allows for a more thorough understanding of consumer behaviours by including observations from generally unrepresented groups. The stratified random sampling technique involves the division of the population into separate subgroups (strata) and then randomly selecting samples from each stratum. This method has the potential to offer a more profound understanding by guaranteeing that all crucial subgroups are adequately included within the sample. Fifth, this study utilised a closed-ended structured questionnaire for data collection. Future studies could use other methods, such as face-to-face and focus group interviews, to get more generalised responses from the respondents. Conducting detailed interviews with consumers yields valuable insights into the personal values, beliefs, and attitudes influencing their purchase of environmentally friendly products. This approach enables researchers to investigate the fundamental motivations and the emotional and cognitive processes that quantitative methods may not comprehensively capture. Focus groups permit engaging discussions that uncover a range of opinions, social influences, and group dynamics that influence consumer behaviour towards

green electronics. Interviews also reveal specific barriers, such as perceived higher cost, limited availability, or doubt about environmental advantages, while focus groups reveal common difficulties and points of resistance. A broad understanding of the subject enables marketers to develop effective strategies that address challenges and encourage consumers toward environmentally friendly electronic products. Moreover, this study used PLS-SEM with quantitative research methods; further scholars could employ qualitative or mixed research methods. Sixth, this study used at least a minimum qualification (High school) for sample characteristics, which include all the consumers who have qualifications from high school to higher education. Future researchers investigate uneducated consumers to know the awareness among these individuals about current environmental issues facing our planet.

Lastly, the prime focus of this investigation was to assess the impact of extended TPB constructs (environmental concern and ethical obligation) on consumer behaviour regarding green electronic products. Within the TPB framework, consumers with a greater level of concern for the environment are more inclined to have a positive perception toward green electronic products, which in turn influences their intention to purchase such products. As a result, this favourable intention to make purchases further improves their purchasing behaviour for these particular products. Similarly, ethical obligation represents the sense of responsibility or obligation consumers experience to make environmentally favourable decisions. The primary impact of this construct is on the purchase intention component of the TPB model, which in turn influences consumer behaviour toward green electronic products. Collectively, these constructs boost the predictive efficacy of the TPB model by considering supplementary motivational elements that impact the decision-making process. Future studies should consider integrating other essential variables from green marketing literature, such as eco-labelling, green consumption values, receptivity to green advertising, willingness to pay, and other relevant constructs within the TPB framework, to better understand consumer behaviour toward green electronic products. Furthermore, the proposed model's predictive power (R^2) is 53.9% for the intention to purchase and 51.8% for purchase behaviour. Consequently, the R^2 may increase with the addition of the abovementioned constructs. These additional variables could contribute to the remaining variance in the current model and may provide depth to the analysis of future investigation.

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