Research article

How and when consumer corporate social responsibility knowledge influences green purchase behavior: A moderated-mediated model

Appel Mahmud

Department of Accounting and Information Systems, Begum Rokeya University, Rangpur, Rangpur 5404, Bangladesh

A B S T R A C T

Due to global warming and climate change, consumers worldwide are now carefully evaluating corporate social responsibility (CSR) practices when choosing which businesses to engage with, aiming to enhance their resilience to the adverse effects of these global issues. The current study employs the theories of reasoned action and planned behavior to explore how consumer CSR knowledge (CCK) impacts green purchase behavior (GPB) and consumer environmental attitude (CEA). Additionally, it assesses the mediating influence of CEA on the connection between CCK and GPB, while also examining the moderating role of perceived consumer effectiveness (PCE) in the interactions between CCK and GPB directly and via CEA. Primary data were collected through surveys from 336 EMBA students in Bangladesh over a three-month period, spanning from 9 August to November 8, 2022. The collected data and the suggested model were analyzed and validated using Mplus. The results show that CCK significantly improves GPB and CEA. CEA partially mediates the relationship between CCK and GPB. PCE significantly moderates the relationships between CCK and CEA directly and via CEA, such that CCK positively influences CEA and GPB when PCE is high only. Lastly, the current study documented theoretical and practical implications and concluded that CCK encourages consumers to adopt environmentally friendly attitudes, which in turn motivates them to exercise green behaviors such as GPB.

1. Introduction

Corporate social responsibility (CSR) is the belief that businesses should voluntarily incorporate environmental and social issues into their operations and interactions with their core stakeholders [1]. Considering the adverse effects of global warming and climate change, in the twenty-first century, consumers are shifting their traditional behaviors toward environmentally friendly ones to promote their eco-social self-identity in their community and they are increasingly demanding green products as their sustainable consumption choice [2,3]. Contemporary business executives and social scientists view CSR as a powerful strategic management tool for controlling the eco-social behaviors of a variety of stakeholders who may have an impact on the decision of the business to operate in a particular manner [2,4,5]. In this regard, consumers are thought to be the most influential external stakeholders of an organization who always play vital roles in promoting brand image, company reputation, long-term business growth, and social, environmental, and economic sustainability on a large scale [6–8]. As a result, they should also carefully scrutinize CSR practices when deciding which businesses to choose and strengthen their relationship with [3,4,8].

Table 1

Summary of previous studies of the implications of CSR Knowledge and environmental knowledge on green and other voluntary behaviors.

Author (year)	Key variables	Research methods, samples, and country	Theory	The main findings of the study
Al-Swidi & Saleh, 2021	Green purchasing behavior, Green values, Government green initiatives, and Knowledge of green products	A survey of 251 university students in Qatar	Theory of planned behavior, Stern's value-belief-norm theory, and Cognition affection behavioral theory	The findings unveiled that green purchasing behavior is directly affected by green attitudes, social influence, knowledge, and perceived behavioral control toward sustainability.
Berki-Kiss & Menrad (2022)	Purchase intention, Perceived consumer effectiveness, Emotion, and Subjective norm	An online survey of 1201 flower buyers in retail shops in Germany	Theory of planned behavior	The study shows that the decision to purchase Fairtrade roses is primarily guided by the emotions and subjective norms of buyers, reflecting their commitment to sustainable consumption.
Chan et al. (2014)	Environmental knowledge, Environmental awareness Environmental concern, and Ecological behavior	A survey of 438 hotel employees in Hong Kong	Theory of reasoned action and Theory of planned behavior	The findings suggest that environmental knowledge, awareness, and concerns drive eco-friendly actions, ultimately influencing the intention to adopt green practices in Hong Kong.
Chung & Lee (2022)	CSR fit, CSR history, Purchase intention, and Negative word of mouth	A survey of 252 U S. general consumers	Framing theory and Associative network theory,	The research reports that CSR fit positively influences purchase intention and decreases negative word-of-mouth by enhancing perceived integrity and attitude towards the apology statement, ultimately improving the overall attitude towards the company. Additionally, CSR history also positively impacts purchase intention and reduces negative word-of-mouth through similar pathways.
Dang et al. (2020)	Perceived consumer effectiveness, Consumer trust, Retailer CSR, and consumer citizenship behavior	A survey of 407 consumers in China.	Social identity theory and Signaling theory	The findings show that retailer CSR demonstrates a positive link with consumer citizenship behavior. This relationship is further strengthened by perceived consumer effectiveness and consumer trust acting as positive mediators.
Dhir et al. (2021)	Environmental knowledge, Green trust, Environmental concern, Environmental attitude, and Green apparel buying behavior	A survey of 387 Japanese consumers	Attitude-behavior-context theory	The study reports that belief in green practices, caring for the environment, and satisfaction with labels drive buying green clothes. Additionally, trust, concern for the environment, and attitude play a role. Age and gender affect how knowledge impacts concern.
Hossain et al. (2022)	Environmental knowledge, Eco-label knowledge, Green trust, and Pro-environmental behavior	A survey of 1510 households in Bangladesh	Theory of planned behavior	The research findings highlight that environmental knowledge, familiarity with eco-labels, a positive outlook, and confidence in eco-friendly practices are associated with consumer engagement in pro-environmental actions. Moreover, a positive attitude and trust in eco-friendly practices serve as significant factors in bridging the gap between the knowledge and behavior of a consumer.
Jaiswal & Kant (2018)	Green purchase intention, Attitude towards green products, Environmental concern, Perceived environmental knowledge, Perceived consumer effectiveness, and Green purchasing behavior	A survey of 351 Indian consumers	Theory of reasoned action and Theory of planned behavior	The results showed that the intention to buy green products was mainly influenced by a positive attitude towards them, environmental concerns, and perceived consumer effectiveness. These factors had both direct and indirect effects through attitude. However, perceived environmental knowledge did not have a significant impact on attitude

Table 1 (*continued*)

Author (year)	Key variables	Research methods, samples, and country	Theory	The main findings of the study
				or green purchase intention in this study.
Kautish & Sharma (2020)	Pro-environmental behavior, Perceived behavioral control, Environmental knowledge, Environmental concern, Perceived environmental consequences, Environmentally conscious consumer behavior, and willingness to be environmentally friendly	A survey of 510 respondents from the state capital of India	Theory of planned behavior	The findings show that being environmentally conscious in consumer behavior is notably shaped by consumers' knowledge of the environment, their perception of environmental consequences, and their level of concern for the environment, which in turn relates to their willingness to adopt eco-friendly practices.
Kim (2019)	CSR communication factors, Consumer company identification, Consumers' CSR knowledge, Trust, and Perceptions of corporate reputation.	A national online survey of 930 U S. consumers	Theory of expectation confirmation and Theory of expectation evidence	The research findings indicate that communication of CSR initiatives enhances consumers' knowledge of CSR, leading to a favorable impact on the company's reputation.
Kim (2022)	CSR communication factors, CSR Knowledge, Trust in the company's CSR commitment, Engagement, Government trust, Consumer company identification, and Corporate reputation	A total of 1110 consumers participated in the Beijing survey, and a total of 1082 consumers participated in the Hong Kong survey	Expectation confirmation theory	This study uncovers that effective CSR communication positively influences consumer attitudes and behaviors, ultimately shaping the overall perception of the company. Both Beijing and Hong Kong consumers show a high receptiveness to CSR messages that highlight the company's efforts. Notably, in Hong Kong, trust in the government can attenuate the impact of CSR communication, whereas in Beijing, this dynamic is not observed.
Mahmud et al. (2023)	Perceived CSR community, Societal behavior, Perceived external prestige, and Organizational identification.	An online survey of 452 middle-level employees from five industries in Bangladesh	Theory of social identity and Theory of social information processing	The results show a positive link between perceived CSR community and societal behavior. External prestige mediates, while organizational identification moderates this relationship.
Nam & Hwang (2019)	Attitudes, Intentions, Creating shared value, and Socially responsible consumption	A survey of 300 Korean consumers	Persuasion knowledge model	The findings show that consumers developed favorable attitudes primarily due to persuasive knowledge, resulting in a greater willingness to engage in the shared value strategy. The study also supports the idea that consumers who are inclined toward socially responsible consumption are more likely to have stronger intentions in this regard.
Onurlubaş (2018)	Environmental concern, Green product purchase intention, and Environmental attitude	A survey of 410 individuals residing in İzmir City of Turkey	Theory of reasoned action	The research reports that environmental concern significantly influences both environmental attitude and the intention to buy green products, while environmental attitude also significantly impacts the intention to buy green products.
Ramesh et al. (2019)	CSR activities, Purchase intention, Brand attitude, Brand image, Competitive advantage, Perceived quality	The sample units were 202 Indian citizens purchasing products from top FMCG companies in CSR spending, selling products in India.	Social exchange theory and Self-expansion theory	The results indicate that customers subconsciously absorb CSR information and may not recall specific details, but they are inclined to include the brand in their consideration due to positive associations formed over time.
Sobuj et al. (2021)	Consumer attitude, Subjective norm, Perceived behavioral control, Environmental concern, Environmental knowledge, and purchase intention	A survey of 198 respondents in Bangladesh	Theory of planned behavior	The research shows that young consumers in Bangladesh are notably influenced in their intention to purchase by their attitudes, subjective norms, environmental concerns, and environmental knowledge.

Table 1 (*continued*)

Author (year)	Key variables	Research methods, samples, and country	Theory	The main findings of the study
Zheng et al. (2021)	Green buying behavior, Perceived environmental responsibilities, Environmental concern, Attitudes, and Subjective norms.	A survey of 305 consumers residing in the capital city of Bangladesh	Theory of planned behavior	The study's findings confirm that Bangladeshi consumers' green buying behavior is influenced by their attitudes, perception of environmental issues' seriousness, level of environmental concern, and subjective norms.

Notes: CSR = Corporate social responsibility, FMCG = First moving commercial goods.

According to CSR researchers, consumer CSR knowledge (CCK) arises from a company's communication with its customers regarding its CSR policy and implementation plan, emphasizing its social, environmental, and economic perspectives [9]. Numerous empirical pieces indicate that when picking a company and making any purchasing decision, customers are constantly highly interested in CSR and eco-social policies [2,4,7]. As customers learn more about a company's CSR initiatives, a better picture of those initiatives' social and environmental impacts emerges [10–12]. In this way, CCK enables people to evaluate a brand's reputation, identity, and social standing [2,12,13]. Thus, due to global warming and climate change, promoting CCK has already been adopted as a corporate mechanism that patronizes consumers to exercise green purchase behavior (GPB) to promote their eco-social self-identity in society which can lead to reducing the adverse effects of these global issues [9,13,14].

Many studies have already used CCK as a bridging factor between stakeholder CSR perception and firm instrumental outcomes by only taking a single-dimensional view, for example, exploring the relationship between CCK and financial success [15], brand attractiveness [16], brand loyalty [17], business reputation [9], and corporate image [18]. Some CSR and green researchers have also investigated the impact of CCK on a variety of non-instrumental outcomes, including citizenship behavior [19], pro-environmental behavior [7], sustainable consumption behavior [20], value co-creation behavior [21], pro-citizenship behavior [22], and green workplace behavior [23] in the context of different developed and developing countries [9,24].

Different studies were also conducted in context bases such as the U.S., Qatar, Germany, China, Hong Kong, Japan, Korea, Turkey, India, and Bangladesh on CSR and green behavior domains [2,9,13,17,22,25–32]. The findings of these studies are equivocal, fragmented, and inconclusive, and most marketing academics have discussed customer intentions to buy green items in industrialized nations. Compared to other developing nations, Bangladesh, an emerging South-Asian economy significantly affected by the adverse impacts of global warming and climate change, is in the early stages of studying CSR, environmental issues, and green purchasing choices [24,30,33]. Although, some studies [e.g., 21,30,31,32] have looked at the marketing mix in emerging Bangladesh connected to CSR and environmental issues toward consumer green behaviors; however, there is a lack of empirical evidence on how CCK affects consumers' GPB in Bangladesh.

However, the stem of contemporary literature on CSR and green behavior suggests that considering the adverse effects of global warming and climate change, there is an urgent necessity for more research in these domains to bridge the gap between CCK and GPB. To address the above research gaps, in the application of the theory of reasoned action [TRA,34] and the theory of planned behavior [TPB,35], the current study aims to investigate the relationship between CCK and GPB and consumer environmental attitude (CEA), and CEA and GPB in Bangladesh. It also examines the underlying mechanism (mediating role) of CEA and tests the boundary condition (moderating placement) of perceived consumer effectiveness (PCE) by addressing four specific research questions (RQs).

RQ 1. What impact does CCK have on GPB and CEA?

RQ 2. What impact does CEA have on GPB?

RQ 3. Would CEA act as a mediator in the relationship between C CK and GPB? If that is the case, why is that?

RQ 4. Would PCE be a moderator of the interaction between CCK and CEA and between CCK and GPB via CEA? If so, then why do these cases exist?

2. Literature review

Recent studies on CSR and green behaviors, especially GPB, have made significant advancements in developed market economies [19,30,34]. Developing countries such as Bangladesh were understudied in these domains; although they are deeply concerned about environmental degradation, especially due to its adverse impact on global issues (i.e., global warming and climate change) and their economic well-being, processes, and national policies [21,22,29]. A few studies (e.g.,1,21,30,31,32) were conducted to examine how stakeholders' CSR knowledge influences their green behaviors and other voluntary activities in developing market economies like Bangladesh. Thus, to extend the research line-up on CSR and green behavior, applying the TRA and TPB, the current study proposes that if consumers have better knowledge of companies' CSR activities and rely more on their CSR knowledge for evaluating firms and purchasing decisions, then their enhanced CSR knowledge may prompt a positive environmental attitude that can influence their GPB in the knowledge→attitude→behavior approach. Furthermore, the researcher argues that consumer knowledge of CSR with a positive CEA (mediating variable) and high PCE (moderating variable) could lead a consumer's GPB to sustain the social, environmental, and economic development of developing market economies such as Bangladesh on a large scale. Table 1 provides a summary of previous

studies of the implications of CSR Knowledge and environmental knowledge on green and other voluntary behaviors.

2.1. The study context

In light of local, national, and global experiences, as one of the most affected victims of global warming and climate change effects, exploring how Bangladesh can guide its corporation toward CSR policies and consumers toward GPB is the prime objective of this study.

According to the World Bank, Bangladesh's gross national product (GDP) growth rate increased significantly over the previous ten years, rising by an average of 6.5 % annually from 5.05 % to 7.86 % [35,36]. The nation has been classified as a higher-middle-income country due to its ongoing economic stability and growth [1,5]. It launched a comprehensive plan named 'Vision 2041' to advance inclusive sustainable development and establish a developed market economy [5,30]. It hopes to reach these goals by being one of the few countries to benefit from the demographic dividend [24].

On this voyage, the greatest challenge lies in dealing with the adverse climatic changes instigated by global warming in Bangladesh [24,30]. Having low altitude and being burdened with a vast population, Bangladesh is relatively highly vulnerable to many environmental and climate hazards caused by global warming [30]. Global warming brings forth several social and environmental hazards by increasing the emission of Carbon dioxide (CO_2) and Green House Gases [GHGs,24,31]. Very often, the country falls victim to the global warming issues and climate change effects caused by the negative externalities of the operations of global corporations [21,24]. The extent of distress and loss of resources caused by climate change in Bangladesh has been enormous [24,31]. CSR initiatives, CSR communication, and green behaviors such as GPB have been strengthened, positively affecting corporate and individual efforts in reducing CO_2 and GHG emissions in Bangladesh [24,30,31].

However, as supporters of the green movement in Bangladesh, local, national, and international businesses should endeavor to link CSR to an eco-social utility for their leading stakeholders and key market players such as consumers [4,21,32]. Therefore, assessing the relationship between CCK and GPB is crucial for policymakers to get an acceptable level of empirical evidence to set proper CSR plans, CSR implementation strategies, and CSR communication to consumers for sustainable environmental, social, and economic development in Bangladesh on a large scale.

2.2. Theoretical support

The TRA and TPB were used in the current investigation to create the study model and structural relationships. According to the TRA, people act according to their knowledge or beliefs and engage in particular behaviors through their attitudes [37]. Additionally, it asserts that people typically behave in a certain way for reasons related to specific ideas and information about that activity [37]. The TRA model's ability to forecast people's actual or intended conduct is, however, heavily questioned by several schools of thought [30,34]. Thus, TPB was created as an advanced version of TRA, to learn more about how individuals plan to act and what they do [38].

The TPB makes the supposition that people behave rationally and logically [19,30]. According to the TPB, a behavior's immediate antecedent is the desire to carry it out. Intentions are proposed to identify the behaviorally motivating variables. It is also argued that behavioral intention is affected by three hidden variables: perceived behavioral control, subjective norms, and attitude toward the behavior [38]. The degree to which a person feels they can carry out a certain activity depends on their perceived behavioral control. The term "subjective norm" refers to how a person feels under societal pressure to engage in a particular action. An individual's general likes or dislikes of a certain action are referred to as their attitude toward that conduct [34].

In the last few years, many researchers used TRA and TPB combined as a theoretical basis in CSR studies to confirm how individuals' knowledge or belief influences their attitudes and behaviors [19,23,30,34,39]. Some studies also used the TRA and TPB models specially to envisage the GPB of consumers. For example, Lončar et al. [34] stated that consumers tend to choose green products as their sustainable consumption choice because such products give them a sense that they care for the environment. While Wang et al. [23] argued that individual consumption decisions influence social and environmental standards, which are likely to be sustainable. Dang et al. [19] examined the link between CSR and consumer outcomes and found that CSR creates customer trust and loyalty. In their study, Hossain et al. [30] found that consumer green behavior in Bangladesh was strongly linked to CSR knowledge, eco-label knowledge, environmental attitude, and green trust. Similarly, Zhang et al. [39] stated that CSR strategies enable firms to improve consumer satisfaction and increase their reputation. Thus, the conceptual model for the current study was built on the TRA and TPB since these theories have been demonstrated to be effective theoretical frameworks for predicting the environmental attitudes and GPB of consumers in Bangladesh subject to their CSR knowledge.

2.3. Development of hypotheses

2.3.1. CCK, GPB, and CEA

According to the TRA and TPB, human knowledge and attitude are critical inner aspects of people that guide them in performing a particular behavior [30]. Knowledge is also thought to impact attitude, and an increased impact of attitudes on behavior is correlated with increased knowledge and vice versa [9,40]. In this study, CCK is defined as a consumer's knowledge and understanding of a company's CSR efforts, which they get from direct and indirect interactions with the company and its business operations [11,13]. As customers learn more about a company's CSR initiatives, a better picture of those initiatives' social and environmental impacts emerges. Therefore, improved CCK aids in evaluating a brand's reputation, corporate identity, company image, and sense of self in society [2,12].

In the same vein, GPB is defined as consumers' purchasing behavior of green products and their environmentally friendly activities that are in line with a nation's economic, social, and environmental sustainability, while CEA is defined as the collection of consumer beliefs, affective intentions, and behavioral intentions regarding environmentally related activities or issues [25]. It gathers knowledge about how customers feel about the environment, what they know about it, what they buy, how they treat the environment, and what other factors affect their decisions to buy green products [40,41].

Empirical evidence reveals that consumers demand qualified and safe products and want to know whether they are produced in socially responsible ways because the consumption of eco-friendly products also supports the sustainment of the atmosphere for future generations [6,17]. It is thought that green products have fewer impacts on the environment or adverse effects on human health than their traditional equivalents, and it is non-toxic, durable, typically made of recycled materials, and minimally packaged [3,34]. People with severe apprehensions about environmental matters such as global warming, climate change, soil degradation, resource depletion, waste reduction, and pollution are projected to be eager to know more about CSR goings-on, including social benefits and environmental protection, possess a positive attitude toward the environment, and change their consumption patterns to green products [7].

The intentions of GPB to consume green products originate from consumers' environmental education, concerns, attitudes, eco-friendly behavior, social norms, and awareness of firms' business operations and CSR practices [30,32]. It is also observed through a consumer's living standards, shopping, transport habits, and perceived barriers to augmented consumption that tie a consumer's green behavior consistent with the environmental standard for its sustainability on a large scale [31,34].

In this regard, CSR scholars argue that CSR communication improves CCK, which is essential for a consumer to sustainably make rational and socially responsible consumption choices [6,13]. CCK is also considered a precondition of the consumer's ability to reward or punish a firm [10]. CSR knowledge processes are insights into how consumers experience CSR and behavior change [9,32]. When a consumer lacks knowledge (or has a low level of knowledge) of a particular product category, the perceived risk level related to the purchase decision of the product category is high [27,29,42]. When their perceived risk level is high, consumers are attentive to the environmental standards and CSR practices by evaluating the brand's social and environmental standards before purchasing its product [27,32]. In this situation, CCK assists in shaping consumers' attitudes toward a company's green products and exercises GPB that ultimately positively affects business reputation and corporate identity in society [4,9,25].

In sum, it is argued that a consumer having reasonable CCK is attentive to products' critical effects on the environment and aware of CSR programs' social benefits, and possesses CSR knowledge to buy products displays a high desire to devote much money to using organic food, buying green products, recycling waste, and doing other green attitudes and behaviors. Upon this discussion, this study proposes to work with Hypothesis 1 (H1) and Hypothesis 2 (H2).

H1. CCK is positively related to GPB.

H2. CCK is positively related to CEA.

2.3.2. CEA and GPB

In the CSR and green literature, the attitude-behavior relationship has received considerable attention [13,30]. The TRA and TPB have also been broadly applied to observe and explicate consumers' attitudes toward their intentions of doing eco-friendly activities and their actual performance of socially responsible behaviors [30]. An attitude is a character that guides an individual's behavior [32, 40]. Generally, CEA is assessed by a consumer's intentions of consumption choices, environmentally aware lives, environmental education, and different keys to ecological concerns [41]. Dhir et al. [26] revealed that environmental attitude is the top guide for forecasting green behavior. Fraj and Martinez [42] discovered that an eco-friendly attitude of consumers is a good determinant of their ecological behavior. Friske et al. [4] revealed a robust optimistic relationship between consumers' ecology-friendly attitudes and environmental behaviors. Ramesh et al. [43] that environmental attitude is undoubtedly correlated to consumers' intent to purchase green products. Chan et al. [25] stated that the three green triggers connected with pro-ecology behaviors are individuals' knowledge of, concerns for, and overall environmental awareness. All these studies reported that environmental attitude is a vital determinant of consumers' ecological behaviors. Therefore, what attitude optimally explains consumers' environmental perspective and outlines their environmentally responsive behavior pattern should be explored.

Based on prior evidence and to confirm previous results, this study follows the rationality of environmental concerns and proposes that environmental attitudes will make consumers behave ecologically responsibly by buying green products. Thus, it proposes Hypothesis 3a (H3a).

H3a. CEA is positively related to GPB.

2.3.3. Mediation of CEA

Ajzen and Fishbein [37] noted that people's attitude resembles the prospect of individuals' inclination toward the actual behavior and epitomizes the immediate antecedents of a specific behavior. Hossain et al. [30] stated that if people are influenced to hold their natural attitude about a specific practice, they will amend their behavior according to their knowledge and views. Fraj and Martinez [42] stated that beliefs sway people's disposition features, their disposition features influence their environmental attitude, and their environmental attitude is directly linked to eco-friendly behavior. Also, Chan et al. [25] indicated that good citizens' ecological behavior could be intensified by various environmental causes such as concerns, awareness, and knowledge. Kim [13] demonstrated that extensively held knowledge forms greater consensus around environmental awareness and social norms that shape a positive attitude that drives particular socially responsible behaviors.

However, CCK vis-à-vis environmental processes, problems, and solutions shape consumers' environmental attitudes. Such

knowledge boosts consumers' environmental awareness to properly care for the atmosphere [41]. The affirmative properties of CCK of environmental concerns and socially responsible behaviors to companies' green initiatives have recurrently been enlightened by various social processes [34]. Al-Swidi and Saleh [17] reported that GPB is an archetypal ranked model of knowledge→attitude→behavior that has been regarded as the fundamental basis for envisaging a consumer's green behaviors on a large scale. Jaiswal and Kant [29] found that consumers' knowledge strongly drives their attitude toward social benefits and environmental protection, and, in turn, they adopt GPB. Similarly, Dhir et al. [26] examined a significantly positive connection between environmental education and other environmental domains such as environmental knowledge, natural attitudes, and eco-friendly behaviors.

In light of previous research, it is argued that CEA has an enormous and positive influence on purchasing intention, and it can be one of the catalysts for GPB. Information about any item enhances a consumer's attitude toward it, and as knowledge affects consumer behavior and purchase decisions, it can also indirectly affect specific behaviors through attitude mediation. Similarly, customers' awareness of organizational CSR may indirectly affect their actions since it is more likely to produce favorable views toward green products, which in turn produces favorable GPB.

According to the knowledge→attitude→behavior model, attitudes can link knowledge and behavior; thus, this study attempts to examine the CEA's mediated role in the relationship between CCK and GPB and sets Hypothesis 3b (H3b).

H3b. CEA mediates the relationship between CCK and GPB.

2.3.4. Moderating role of PCE

As an original theory in psychology, the TRA and TPB predict that a covert action's perceptive expectation influences an individual's decision-making choice [37,38]. In general, PCE indicates the degree to which a consumer believes that the effort made in individuals' consumption choices can transform an environmental problem into a green prospect [44,45]. Similar to the TRA and TBP sense, Arias and Trujillo [46] conceptualized and measured PCE as a subjective estimate to evaluate a person's aptitude to be helpful in the solution of an environmental problem.

In the current study, PCE is defined as the personality traits of consumers that are related to how much consumers think their actions as consumers can help the environment or have a wider social impact such as self-efficacy, self-identity, belief, attitude, knowledge, experience, and trust [47]. Social and behavioral scientists consider PCE a vital determinant of consumers' naturally mindful behavior, including eco-social behaviors [2,6]. This critical variable links with individuals' sustainable consumption choices determined by their direct and indirect environmental knowledge, environmental awareness, ecological concerns, employee welfare, cultural values, and social issues [44]. It also varies across individuals' education, knowledge, experience, skills, and social identities [2].

However, consumers' attitudes toward eco-friendly matters may not straightforwardly change into pro-environment behaviors. Generally, consumers with strong beliefs that their naturally cognizant behavior will return with optimistic outcomes are expected to be guided by a behavioral pattern beneficial to the environment [48]. In addition, consumers who are confident that their consumption choice contributes significantly to social benefits and environmental safeguards are more likely to support sustainability by exercising green behaviors such as GPB [17].
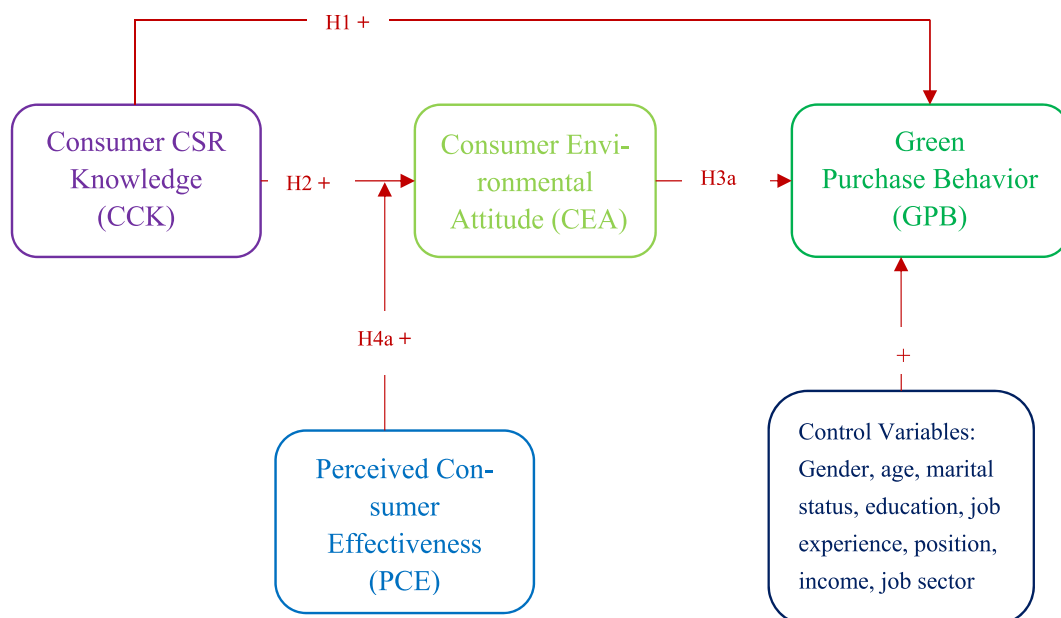

Fig. 1. Research model.

An impressive body of research confirms that individuals' unwavering beliefs about PCE lead to logical consumption choices and that individuals with high PCE exhibit eco-friendly attitudes and behaviors, unlike those with low PCE [2,44]. Therefore, several previous examinations have exposed the direct or mediating effects of PCE on sustainable consumption practices or related green behaviors (e.g.,2,46,48). Nonetheless, Higueras-Castillo et al. [45] tested the moderating effect of PCE on the determinants of consumers' intention to adopt green products in terms of green self-identity, prior knowledge, trust, attitude, and incentives. Calderon-Monge et al. [48] examined personal values, PCE, and demographic factors for their influence on Korean consumers' GPB. Most researchers found that PCE moderated the indirect positive effects of altruism and the biosphere in this regard.

As it is one of the most studied variables in the field of CSR and green research, the moderating role of PCE is further tested to examine its effect on the relationship between CCK and CEA and the indirect connection between CCK and GPB through CEA following the previous research line-up [2,47]. Thus, the study proposes the following hypotheses.

H4a. PCE moderates the relationship between CCK and CEA such that the link is strong and significant when PCE is high (vs low).

H4b. PCE moderates the indirect connection between CCK and GPB via CEA such that the link between CCK and GPB via CEA is strong and significant only when PCE is high (vs low).

Fig. 1 describes the conceptual model of the current study.

3. Research methods

3.1. Sampling procedures

Following previous studies that considered university students as respondents [e.g.,8,17,22,31], the current research recruited 336 Bangladeshi business executives enrolled in the EMBA program at a public university in Bangladesh to collect responses using the convenience sampling technique. In Bangladesh, CSR is a new concept, and the evaluation of the impacts of CSR on a particular behavior (notably GPB) is also a very critical and complicated task [24]. Green assessment is also a growing concern in Bangladesh

Table 2
Demography of respondents.

Variables	Frequency	%
Gender (n = 336)		
Male	184	54.8
Female	152	45.2
Age		
25–35 year	182	54.2
>35–≤45 years	115	34.2
>45–≤55 years	27	8.0
>55 years	12	3.6
Marital status		
Married	214	63.7
Unmarried	122	36.3
Education		
Bachelor	41	12.2
Master or above	295	87.8
Job experience		
<1 year	74	22.0
1–5 years	112	33.3
>5–≤10 years	71	21.1
>10 years	79	23.5
Position in the organization		
Lower level	51	15.2
Middle level	230	68.5
Upper level	55	16.4
Monthly salary/income ($)		
<250	61	18.2
250–500	118	35.1
501–750	73	21.7
751–1000	41	12.2
>1001	43	12.8
Job sector/industry		
Financial	137	40.8
Telecommunication	55	16.4
Pharmaceutical	37	11.0
Apparels	47	14.0
Transportation	25	7.4
Public utility	24	7.1
Other	11	3.3

Source: Author's illustration

since it guarantees better goods or food quality, especially for health and the environment [30,31].

However, in Bangladesh, the high-class and educated population is often aware of organizational CSR practices and engages in green consumerism; therefore, business executives are thought to be familiar with CSR more transparently, and it is expected that they have more knowledge about CSR and its impacts on stakeholder green behaviors in this newly emerging market economy. As highly educated professionals and concerned citizens of Bangladesh, business executive-EMBA students are also often relied on to make judgments about their in-official activities and household consumption choices in socially responsible ways through exercising green behaviors such as GPB [24]. Thus, this study selected Bangladeshi business executives–EMBA students as respondents.

Target respondents' email addresses were collected from their admission forms with the program director's permission. In total, 480 business executives (Bangladesh natives) were enrolled in the EMBA program, and an online link to the survey was shared with them using convenience sampling in the research line-up of Mahmud et al. [1]. They were requested to be generous in their thoughts when replying to the survey. Before sending the survey link to the whole sample for primary data collection, a pilot survey was done with 37 company leaders to find out how familiar they were with the survey items. The pilot survey reported that no one encountered any severe issues while responding to the survey items.

In addition, the survey items were reviewed by five seasoned corporate leaders, three doctoral students studying CSR, and two professors for this study. Participants' ideas and comments were added to the survey form to help them understand the questionnaire's items better. In three months (from 9 August to November 8, 2022), following up three times with a gap of two weeks, 336 respondents submitted their responses out of 480 EMBA students propelling the response rate to 70%. This rate corresponds with the previous CSR and green research (e.g.,18,20,21). It also meets the general range of 200–400 responses to corroborate the projected research model to the likelihood study method in social sciences [32,48]. Therefore, this study advanced with 336 responses as an acceptable sample size for its key investigation. Table 2 represents the respondents' key demographics.

3.2. Measures

This study explored the past relevant literature on studied variables and adopted the scales accordingly. All variables were measured on five-point Likert scales (shown in the **Appendix**).

CCK: The CCK scale was taken from Kim [13]. It was measured with three items having Cronbach's alpha (CA) 0.82. The example item was "I am very knowledgeable about the good for society the company has been doing."

CEA: The CEA scale was taken from Onurlubaş [28]. It was assessed with four items having CA's 0.74. The example item was "It is a good idea to use green products for protecting nature."

PCE: The PCE scale was taken from the research work of Kim and Choi [49]. It was assessed with five items having CA's 0.79. The example item was "Each person's behavior can positively affect society by signing a petition to promote the environment."

GPB: The GPB scale was taken from the research findings of Chan et al. [25]. It was assessed with five items having CA's 0.81. For example, the first item is "I make a special effort to buy paper and plastic products that are made from recycled materials."

Control Variables: In keeping with earlier studies [e.g.,1,19], participants' demographic details (i.e., gender, age, marital status, education, job experience, job sector, income, and position) were used as control variables to examine their impact on environmentally friendly behavior.

3.3. Analytical strategy

The current research features a moderated-mediated model with four variables; therefore, researchers used Mplus and performed analyses using the tenets of individual-level model testing [50]. Researchers also examined individual-level paths to validate the proposed direct, indirect, and moderated mediation effects [51]. Following the guidelines of Zhang et al. [52], this study also ran path analyses in the framework of unconflated individual-level modeling to avoid the estimation bias of indirect relationships. It proposed formal mediation and moderated mediation hypotheses and performed a series of analyses prescribed by Zhang et al. [52] and Muthén and Muthén [50]. Researchers analyzed data using SPSS 23 and Mplus 7.4 and ran two unique models. Model 4 was used to describe formal mediation, and model 7, moderated mediation. Before the principal investigation, researchers performed data screening to overcome the potential risk of multicollinearity, outliers, wrong coding, and missing values.

Table 3
Descriptive statistics.

Constructs	Mean	SD	1	2	3	4
1. 1. CCK	4.14	.959	1			
2. CEA	3.84	.742	.328**	1		
3. PCE	2.68	.535	.261**	.331**	1	
4. GPB	2.74	.741	.288**	.312**	.058	1

Notes: **Correlation is significant at the 0.01 level. CCK = consumers' CSR knowledge, CEA = consumers' environmental attitude, PCE = perceived consumer effectiveness, GPB = green purchase behavior.

4. Results

[Table 3](#) illustrates the results of descriptive statistics, inter-correlations, and the square root of the average variance extracted. The findings show that all outcomes are as expected and support the earlier hypothesized associations.

4.1. Measurement tests

This study assessed nonresponse bias using the guidelines of Rogelberg and Stanton [53]. In doing so, participants' late and early responses (n = 37) were compared and contrasted using t-tests. The outcomes of t-tests present an insignificant difference between participants' late and early responses, supporting that nonresponse is not an issue in this research. Additionally, this study assessed the concern of common method variance (CMV) using the criteria of Podsakoff et al. [54]. First, it conducted a single Harman factor test in which 22.19% variance (less than 50%) is accounted for, suggesting that the results do not influence CMV. Second, it used the common latent factor (CLF) and combined the confirmatory factor analysis (CFA) model with CLF. The factor loadings for all constructs remain significant, and no significant drop even for a single item. Moreover, the common variance between CFA and CLF is less than 50%, indicating that CMV does not exist in this research.

To see how much the scale is reliable and valid, this study assessed Cronbach's Alpha (CA > 0.7), composite reliability (CR > 0.7), factor loadings (FL > 0.6), and AVE (>0.5) as proposed by Hair et al. [55]. [Table 4](#) shows that the reliability indices are satisfactory, attaining the threshold criteria of reliable measures. The scales' discriminant validity was evaluated using the recent approach of Henseler et al. [56]. They stated that the value of the Heterotrait–Monotrait (HTMT) ratio of correlations for all constructs should be less than 0.85 for strict and 0.90 for liberal discriminant validity. [Table 5](#) indicates that the values of HTMT for all constructs are well below the threshold criteria [56], thus suggesting robust measures.

This study performed CFA in Mplus 7.4 to verify the measurement model. It linked four primary variables (CCK, CEA, PCE, and GPB) in a multidimensional diagram. The outcomes of CFA demonstrate that the loadings of all variables are higher than 0.60 (see [Table 4](#)), successfully attaining the cut-off criteria of model fitness, as advised by Hair et al. [55] and Muthén and Muthén [50]. The indices of model are fit to data well (χ^2 (94) = 1.495, p < .05, CFI = 0.96, TLI = 0.95, SRMR = 0.053, RMSEA = 0.038).

4.2. Testing of hypotheses

[Table 6](#) shows the results of formal mediation analyses. As expected, CCK is positively related to GPB (*β = 0.24, SE = 0.039, t = 4.33, ULCI = 0.231, LLCI = 0.088*), supporting H1. CCK is positively related to CEA (β = 0.27, SE = 0.037, t = 5.26, ULCI = 0.345, LLCI = 0.105), supporting H2. Similarly, CEA is positively related to GPB (*β = 0.26, SE = 0.056, t = 4.73, ULCI = 0.379, LLCI = 0.155*), supporting H3a. To test the proposed indirect association in H3b, this study used the distribution-by-product method to estimate the indirect influence and Monte Carlo simulation with 20,000 repetitions to obtain a 95 % confidence interval (CI), as suggested by Seligman and Preacher [57]. Consistent with H1, H2, and H3a, [Table 6](#) exhibits the significant indirect influence of CCK on GPB (*β = 0.071, SE = 0.023, t = 2.11, ULCI = 0.121, LLCI = 0.030*) through CEA, thereby supporting H3b.

[Table 7](#)a shows the outcomes of the path analyses of the moderated-mediated framework. H4a proposes that PCE moderates the association between CCK and CEA, such that the direct association between CCK and CEA is positive (only) when PCE is high. The beta coefficient for the interaction term between CCK and PCE on CEA is significant (*β = 0.35, SE = 0.07, t = 2.47, ULCI = 0.341, LLCI = 0.022*), supporting **H4a** (see [Fig. 2](#)). To explain the type of interaction, this study has followed recent research (e.g.,1,33) and adopted

Table 4
Outcomes of confirmatory factor analysis and reliabilities.

Constructs		Loadings	Estimates	SE	CR (t)	CA	CR	AVE
CCK	CCK1	.80	1			.82	.83	.62
	CCK 2	.82	1.037	0.07	13.75			
	CCK 3	.73	0.980	0.08	12.78			
CEA	CEA1	.72	1			.74	.84	.56
	CEA 2	.69	0.994	0.11	8.419			
	CEA 3	.76	1.259	0.17	7.306			
	CEA 4	.81	1.231	.015	9.698			
PCE	PCE1	.75	1			.79	.85	.53
	PCE2	.79	1.459	0.43	3.351			
	PCE3	.65	0.850	0.27	2.046			
	PCE4	.69	1.233	0.17	7.223			
	PCE5	.74	1.467	0.22	9.831			
GPB	GPB1	.62	1			.81	.84	.51
	GPB2	.64	0.884	0.11	7.536			
	GPB3	.78	1.115	0.18	6.117			
	GPB4	.71	0.788	0.15	5.141			
	GPB5	.79	0.972	0.16	5.767			

Notes: All factor loadings and estimates are significant at p < .001 level, CA = Cronbach's alpha, CR = Composite Reliability, AVE = Average variance extracted, CCK = Consumer CSR knowledge, CEA = Consumer environmental attitude, PCE = Perceived consumer effectiveness, GPB = Green purchase behavior.

Table 5

Heterotrait–Monotrait analysis (HTMT).

	CCK	CEA	PCE	GPB
CCK				
CEA	.46			
PCE	.41	.35		
GPB	.38	.45	.21	

Notes: CCK = Consumer CSR knowledge, CEA = Consumers environmental attitude, PCE = Perceived consumer effectiveness, GPB = Green purchase behavior.

Table 6

Mediation test outcomes.

Predictors	Mediator: CEA						Dependent variable: GPB					
	β	SE	t	ULCI	LLCI	R²	B	SE	t	ULCI	LLCI	R²
Direct effects.						18						.15
Job experience	.06*	.035	1.96	.044	.006		.047*	.035	2.01	.110	.056	
CCK	.27***	.037	5.26	.345	.105		.24***	.039	4.33	.231	.088	
PCE	.36***	.071	5.02	.565	.277		.13***	.045	2.01	.288	.027	
CEA	–	–	–	–	–		.26***	.056	4.73	.379	.155	
Indirect effects												
CCK → GPB (via CEA)							.071**	.023		.121	.030	
PCE → GPB (via CEA)							.094**	.021		.117	.033	

Notes: *N = 336, Coefficients (β) are significant at ***p < .001, **p < .01, and *p < .05. CCK = Consumer CSR knowledge, CEA = Consumer environmental attitude, PCE = Perceived consumer effectiveness, GPB = Green purchase behavior.*

Table 7a

Path analysis.

Predictors	Mediator: CEA						Dependent variable: GPB					
	β	SE	t	ULCI	LLCI	R²	B	SE	T	ULCI	LLCI	R²
.19												*.17*
Direct Effects												
Job experience	.07	.03	1.36	−.104	.016		.14**	.035	2.74	.289	.200	
CCK	.40***	.18	3.48	.345	.105		.15***	.038	3.96	.231	.088	
PCE	.75***	.28	3.63	.565	.277		.13*	.045	2.01	.288	.027	
CCK × PCE	.35**	.07	2.47	.341	.022		–	–	–	–	–	
CEA	–	–	–	–	–		.26***	.055	4.75	.379	.155	

Notes: *N = 336, Coefficients (β) are significant at ***p < .001, **p < .01, and *p < .05. CCK = Consumer CSR knowledge, CEA = Consumer environmental attitude, PCE = Perceived consumer effectiveness, GPB = Green purchase behavior.*

the Edwards and Lambert [58] method to draw the moderating influences of PCE on the linkage between CCK and CEA. The outcomes, as shown in Fig. 3, reveal that the linkage between CCK and CEA is significant only when PCE is high (*β = 0.412, t = 3.23, p < .05*) and is not significant when PCE is low (*β = 0.09, ns*). These findings exactly explain H4a.

To investigate the conditional indirect influences of CCK on GPB via CEA, indirect impacts across the high and low values of PCE (+SD and -SD) were examined. This study used the distribution-by-product method to estimate the indirect influence and Monte Carlo simulation with 20,000 repetitions to obtain a 95 % confidence interval (CI), as suggested by Seligman and Preacher [57]. The outcomes of conditional indirect influences are illustrated in Table 7b. The conditional indirect impact of CCK on GPB via CEA when PCE is high significantly differs from zero (γ = 0.067, 95 % CI: 0.115 to 0.031). On the contrary, the conditional influence of CCK on GPB through CEA when PCE is low is not statistically significant (γ = 0.023, 95 % CI: 0.072 to 0.009). The total effects of CCK on GPB across all paths (direct and indirect) are positive (γ = 0.254, SE = 0.113, 95 % CI: 0.680 to 0.244), suggesting that individuals with high knowledge of a firm's CSR are more likely to engage in GPB than those with low CSR knowledge. Moreover, individuals with more CSR knowledge exhibit GPB when PCE is high. These findings support H4b.

5. Discussion

The current research comprises four key variables such as CCK as an independent/background variable, GPB as a dependent/outcome variable, CEA as a mediating variable, and PCE as a moderating variable. A moderated-mediated model has been built to connect these critical variables and in total six hypotheses were tested. The study's findings report that all hypotheses were supported well.

First, this study's findings show that CCK is positively related to GPB and CEA. It means that consumers' knowledge of CSR leads to
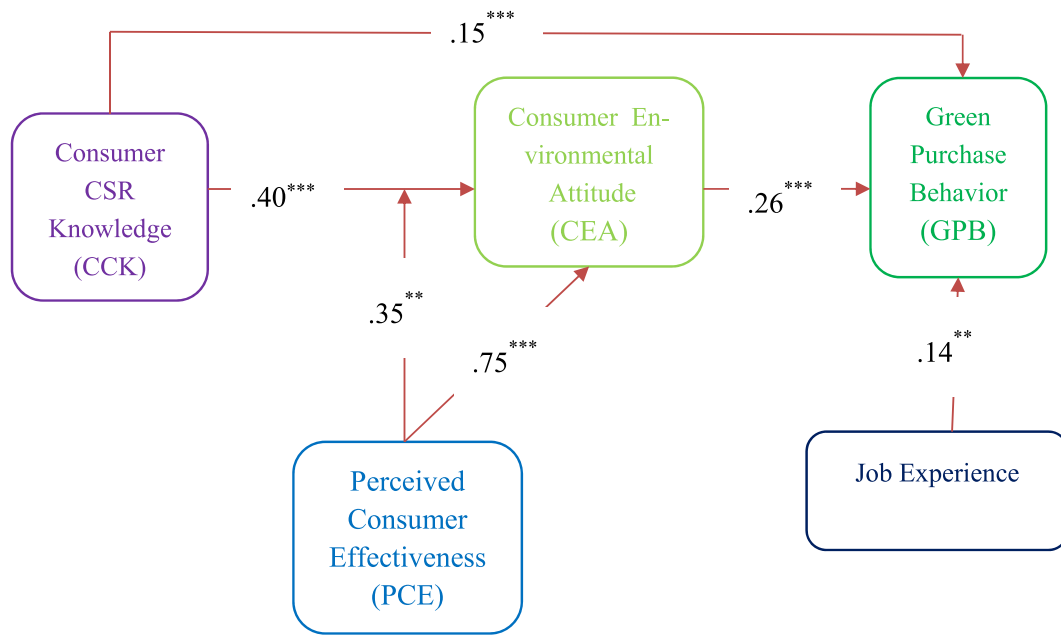
Fig. 2. Path analysis diagram.
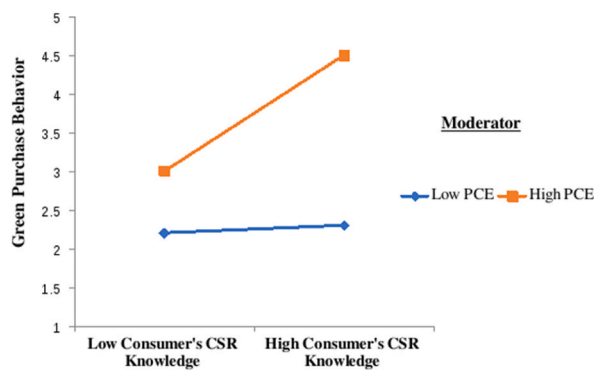Notes: Significant at ***p < .001, and **p < .01.

Fig. 3. Interaction effect of perceived consumer effectiveness (PCE).

Table 7b
Effects of CCK on GPB.

Predictors	Mediator	Moderator: PCE	Effect	SE	t	ULCI	LLCI
Indirect effect							
CCK	CEA	–	.104**	.098	2.60	.449	.068
Total effects							
CCK	CEA	–	.254***	.113	3.29	.680	.244
Conditional indirect effects							
CCK	CEA	High (PCE at +1SD)	.067***	.021	2.23	.115	.031
		Mean (PCE at Mean)	.045**	.016	2.01	.082	.019
		Low (PCE at -1SD)	.023^{ns}	.020	1.24	−.072	.009
Conditional total effects							
CCK	CEA	High (PCE at +1SD)	.327***	.144	4.10	.555	.345
		Mean (PCE at Mean)	.305***	.121	3.35	.226	.073
		Low (PCE at -1SD)	.283**	.102	2.55	.210	.044

Notes: *N = 336, Coefficients (β) are significant at ***p < .001, **p < .01, and ns = Non-significant. CCK = Consumer CSR knowledge, CEA = Consumer environmental attitude, PCE = Perceived consumer effectiveness, GPB = Green purchase behavior.*

behaving in an environmentally friendly manner as a sustainable consumption choice by exercising GPB. This outcome is in line with the findings of Cheema et al. [7], and Kim [13]. Cheema et al. [7] found that CSR perceptions positively affect business officials' GPB. Kim [13] argued that consumers are inclined to have a better knowledge of companies' CSR activities and a strong belief in their obligation, which, in turn, indicates consumers' positive perception of a business reputation as the consequence of their CSR knowledge. Therefore, consumers' knowledge about the tradeoff between CSR activities and traditional corporate abilities could influence their reactions to CSR, which leads to ecological behavior.

On the contrary, this finding is inconsistent with Boccia et al. [18] and Ramesh et al. [43]. Boccia et al. [18] reported that only a few ready-made food consumers implement CSR as a choice criterion for purchases, whereas traditional procuring criteria (in particular the price) still prevail. Ramesh et al. [43] stated that consumers process CSR facts unconsciously and may not reminisce about the explicit detail, but they are more likely to embrace the brand out of the attention set suggested by positive attitudes trailing behind. These inconsistent findings may lead to new research in CSR and green fields.

The study's findings also report that CEA is favorably connected to GPB. It indicates that consumers have a particular environmental attitude to diminish pollution, soil erosion, and environmental degradation and this attitude shapes their viewpoints toward sustainable consumption choices by exercising GPB. This finding is tied with the outcomes of Fraj and Martinez [42] and Jaiswal and Kant [29]. Fraj and Martinez [42] revealed that the meaningful predictor of consumers' ecological behavior is their environmental attitude, which is vital in sustaining eco-friendly behavior. Jaiswal and Kant [29] reported that the green attitude level is the essential predictor of GPB.

In this study, CEA mediates the effect of CCK on GPB. It means that when consumers update their knowledge of CSR activities, their CSR knowledge then works as a driver in shaping their environmental attitude, leading them to adopt GPB as a sustainable consumption choice. This finding is consistent with Boccia and Sarnacchiaro [20] and Edinger-Schons et al. [11]. Boccia and Sarnacchiaro [20] examined how consumers' knowledge and attitude affect their view of CSR in the social and environmental aspects. They found that the most significant components that help the consumers choose a firm to buy the necessities are their awareness of the company's operation, CSR activities, and sensitivity to environmental issues. Edinger-Schons et al. [11] reported that consumers' CSR knowledge has reliably been exposed to the consumer–company identification and shapes consumers' attitudes toward buying a company's green products as a sustainable consumption choice. Therefore, it can be remarked that consumers who know more about the company's business operations and upgrade their CSR knowledge usually change their attitudes to buying green products from companies with better CSR practices.

This study indicates that consumers with a high level of PCE strengthen the positive consequence of CCK on CEA and enhance the effect of CCK on GPB via CEA. This study delivers an appreciated recap of the position of assimilating PCE into the model, illuminating consumers' environmental attitudes and GPB. This finding is consistent with those of Currás-Pérez et al. [47] and Higueras-Castillo et al. [45]. Currás-Pérez et al. [47] revealed that consumers with high PCE sense that their consumption choice significantly impacts the society in which they live. Higueras-Castillo et al. [45] reported that the significant effect of green self-identity on environmental attitude is exclusive to consumers with a high level of PCE. Therefore, eco-friendly behavior and attitudes exert a robust effect on ecological and CSR knowledge utilization for educated individuals with high PCE in an emerging market economy such as Bangladesh.

The findings of the current study can also be compared to earlier research conducted in the U.S., Qatar, Germany, China, Hong Kong, Japan, Korea, Turkey, India, and Bangladesh. In the U.S., communication of CSR initiatives enhances consumers' knowledge of CSR, leading to a favorable impact on the company's reputation and green purchase decision [13]. GPB is directly influenced by consumers' green attitudes, social influence, knowledge, and perceived behavioral control toward the sustainability of Qatar [17]. The decision to purchase green products is primarily guided by German buyers' emotions and subjective norms, reflecting their commitment to sustainable consumption [2]. Environmental knowledge, awareness, and concerns drive eco-friendly actions, ultimately influencing the intention to adopt green practices in mainland China and Hong Kong [9,25]. Japanese consumers' belief in green practices care for the environment, and satisfaction with labels drive their purchase of green products [26]. Korean consumers develop favorable attitudes toward green products primarily due to persuasive knowledge, resulting in a greater willingness to engage in the shared value strategy [27]. Environmental concern significantly influences both environmental attitudes and the intention to buy green products in Turkey [28]. In India, the intention to buy green products is mainly influenced by consumers' knowledge of the environment, their perception of environmental consequences, and perceived consumer effectiveness [22,29]. Consumers in Bangladesh are notably influenced in their intention to purchase green products by their attitudes, subjective norms, environmental concerns, and environmental knowledge [30–32].

However, in line with earlier studies, the current study also contributes to showing that in Bangladesh, consumers have a moral obligation to focus on socially responsible green behaviors. These include adopting GPB and green product consumption choices, using natural resources with utmost efficiency, and utilizing effective strategies for carbon management. These practices are considered essential for maintaining the ecological balance and sustainability of the country.

6. Conclusion

The current research reports Bangladeshi consumers' knowledge of CSR and their choice criteria for exercising GPB with a moderated-mediated model under the application of the TRA and TPB. It is the first study that identifies the mediating effects of CEA between CCK and GPB and the moderating role of PCE in the relationship between CCK and CEA and CCK and GPB via CEA. All hypotheses of this study were supported and the study's result reports that CCK encourages consumers to adopt environmentally friendly attitudes, which in turn motivates them to exercise green behaviors such as GPB. Therefore, it is remarkable that CCK is a vital

resource for a consumer that guides them to choose a firm, buy products from it, and exercise green behaviors in society. In this regard, CEA is a vital cognitive driver leading individuals to purchase green products as sustainable consumption choices. The connections between CCK and CEA and CCK and GPB via CEA strengthen when consumers strongly believe that their consumption choices (i.e., PCE) positively affect the environment, play a vital role in preventing global warming and climate change, and support in favor of the morale of CSR and green literature as "sustainable consumption for sustainable development" of an emerging economy such as Bangladesh.

6.1. Theoretical contribution

In this study, in the application of TRA and TPB, a moderated-mediated model connected four key variables and proposed six hypotheses that were supported and accepted by considering the statistical values of relevant tests. Therefore, this study has several theoretical contributions to the literature on CSR and green domains.

First, CSR knowledge and environmental concerns are critical to people. When people are sufficiently informed about a company's CSR initiatives and commercial operations, they desire to purchase environmentally friendly items. After finishing the study and understanding the findings, researchers can state that Bangladeshi customers are not an exception; professionals with higher education (business executives and EMBA students) are interested in purchasing green products and supporting the spread of CSR knowledge and green marketing to address environmental challenges.

Second, this study contributed by theoretically and empirically establishing the relationship between CCK and GPB, CCK and CEA, and CEA and GPB in Bangladesh, which was mostly skipped in the literature on CSR and green domains. This study is the first of its kind that explores consumers' CSR knowledge to predict their GPB and CEA using TRA and TPB as a conceptual foundation. The findings support that the extended TRA and TPB are valuable models for comprehending Bangladesh's educated customers' CCK, GPB, and CEA. Thus, with the addition of the constructs CCK, CEA, PCE, and GPB, the research has helped close a research gap in CSR and green consumer behavior by employing TRA and TPB in an emerging market country like Bangladesh.

Third, in the modern era, most corporate marketing strategies keep silent on the firms' perspective of environmental legitimacy, which relies upon the acceptability of ecological compassion of the consumers [21,30]. According to the preceding arguments, the link of CEA→CCK→GPB appears valid in the CSR and green literature because a more positive environmental attitude should encourage learning and procurement of CSR knowledge, which consequently facilitates GPB. However, in the application of TRA, the current study tested the new ways of CCK →CEA→GPB, which is the novelty of this study. The current study's findings also justified that the above model is strongly supported theoretically and valid empirically in emerging market economies like Bangladesh.

Fourth, the current research is the first study that explored the mediation mechanism of CEA to predict the influence of CCK on GPB. The study's outcome confirmed that CEA mediates the linkage between CCK and GPB. Thus, the current study contributed to the green and CSR literature by identifying CEA as a critical mediator that links CCK and GPB.

Fifth, the study contributed by identifying the crucial role of PCE as a moderating agent in the mechanism between CCK and CEA. The finding revealed that high PCE could conclusively lead to strengthening the impact of CCK on CEA. It also upgraded the CSR and green literature by arguing that PCE is crucial for cultivating individuals' CSR knowledge and reflecting their environmental attitudes on green behaviors.

Lastly, the current study has moderated mediation analysis illustrated that the indirect effect of CCK on GPB is mediated through CEA and moderated by PCE. In particular, the impact of CCK on GPB through CEA is strong when PCE is high, but the indirect effect is relatively weak when PCE is low. Thus, this study reported that PCE is a critical intervening force in the association between CCK and GPB via CEA by extending the TRA and TPB in CSR and green literature.

6.2. Practical implications

The current study's findings help the management of organizations concerning CSR knowledge, environmental attitudes, and green policies in several ways.

First, this research may assist the firm's marketing executives and CSR managers in enhancing consumers' understanding by running consumer awareness campaigns about the environment because CSR communication improves CCK, which subsequently enhances the business reputation and pushes the consumers toward GPB [6,13]. Therefore, companies should provide training in communication development to their marketing executives, CSR managers, and public relations officers.

Second, as an organization is considered a trendsetting entity, organizations' efforts to educate consumers can lead them toward forming a positive environment-caring attitude and adopting green practices in their daily lives [4]. This research thus unveils how the consumers' environment-caring attitude and green behavior can be initiated and how their CSR knowledge can be boosted from their previous experiences. These findings may enhance the insights of green policymakers, including government officials, non-government organizations, and corporate leaders, and support patrons to form eco-friendly attitudes and green behaviors.

Third, this research reports that PCE is an effective moderating mechanism that modifies the association between CCK and CEA directly and CCK and GPB via CEA. A publicity policy should be disseminated through popular social media, such as Facebook, Twitter, Channels, and YouTube, to convey that an individual's sustainable consumption choice and related green behaviors can lessen the adverse effects of global warming and climate change on a large scale [9,59].

Fourth, the current study could contribute to showing that in Bangladesh, consumers have at least a moral obligation to focus on socially responsible behaviors such as adopting green product consumption choices, using natural resources with utmost efficiency, and utilizing effective strategies for carbon management, which are considered to be essential for maintaining ecological balance and

sustainability [14,17,30].

Fifth, the current study could also teach consumers and public and private corporate entities that must agree upon and accept CSR practices in a greening society by adopting green policy and GPB as organizational and individual social responsibilities. Thus, adopting an organizational proper green policy as a part of organizational CSR and consumers' GPB as a sustainable consumption choice can be an effective and efficient practical tool to lessen pollution, soil erosion, and environmental degradation and sustainable development of Bangladesh on a large scale [17,21].

Lastly, with the foremost CSR knowledge of consumers and associated environmental awareness, companies can commence a green campaign to adequately address the market with various consumer groups for building a better earth by protesting the climate change threats in Bangladesh.

6.3. Research limitations and directions for the future

Although the current research's aims have been achieved, a couple of limitations must be addressed in future studies.

First, this study gathered data from one country (i.e., Bangladesh), which may lessen the generalizability of the current findings in other contexts and carefulness is to be ensured while relating the framework to other regions. Therefore, future studies should be conducted in different settings or cross-cultural research to strengthen the current study outcomes.

Second, this research was performed on a cross-sectional data collection design, which may create a common method bias (CMB). Even though the results of the study showed that CMB was at a minimum, it is suggested that future studies use a longitudinal approach to look at the model over time and make its conclusions clearer.

Third, this study recruited participants from a public-sector university in Bangladesh. Nevertheless, having a more diverse set of participants would be helpful as they would vary in levels of CCK and GPB. Thus, careful efforts are required while inferring the results to business communities; future studies should perform comparative studies by collecting data from public and private universities or consumers of green products countrywide.

Fourth, in this study, only 336 responses were used to weight the model, which is a respectable sample size but falls short of meeting all criteria for an optimal sample size.

Fifth, the data were analyzed, and the proposed model was tested by using Mplus but in the future, it may be worth using the partial least squares structural equations modeling (PLS-SEM) approach and comparing the results.

Sixth, the socio-demographic characteristics of the respondents are well presented in this study, but no deeper analysis is connected to them. Thus, future studies should incorporate this issue.

Lastly, this study did not measure how the high level of CCK leads to GPB. Thus, future studies should extend this research research model by examining this phenomenon.

Data availability statement

Research data is available upon request.

Funding

Ethics approval

This study was reviewed and approved by the Human Ethical Research Committee, Department of Disaster Management, Begum Rokeya University, Rangpur, Rangpur 5400, Bangladesh. Approval Number: Ref: BRUR/DSM/HREC/Ap. Letter/2022/1004 (2).

Consent to participate

Informed consent was obtained from all individual participants included in the study.

Additional information

No additional information is available for this paper.

CRediT authorship contribution statement

Appel Mahmud: Writing - review & editing, Writing - original draft, Software, Resources, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.

Declaration of competing interest

The author declares that he has no known competing financial interests or personal relationships that could have appeared to

influence the work reported in this paper.

List of abbreviation

CSR	Corporate social responsibility
CCK	Consumer corporate social responsibility knowledge
GPB	Green purchase behavior
CEA	Consumer environmental attitude
PCE	Perceived consumer effectiveness
EMBA	Executive master of business administration
TRA	Theory of reasoned action
TPB	Theory of planned behavior
RQs	Research questions
GDP	Gross national product
CO_2	Carbon dioxide
GHGs	Green House Gases
H1	Hypothesis 1
H2	Hypothesis 2
H3a	Hypothesis 3a
H3b	Hypothesis 3b
H4a	Hypothesis 4a
H4b	Hypothesis 4b
CA	Cronbach's alpha
CMV	Common method variance
CLF	Common latent factor
CFA	Confirmatory factor analysis
CR	Composite reliability
FL	Factor loadings
AVE	Average variance extracted
HTMT	Heterotrait–Monotrait
CMB	Common method bias
PLS-SEM	Partial least squares structural equations modeling
FMCG	First moving commercial goods

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.heliyon.2024.e24680.

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