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Corporate social responsibility and consumer purchase intentions with environmental benefit perception as mediator and multilevel moderating effect

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As the impact of corporate social responsibility (CSR) on consumer behavior has attracted increasing attention, researchers have begun to explore the mechanisms through which CSR influences consumer decision-making. This study explored how consumers' perception of CSR affects their purchase intention by constructing a multilevel model, focusing on the mediating role of environmental benefit perception and the moderating role of value orientation and corporate environmental performance. Based on 445 consumer data and multi-industry environmental performance data, this study finds that consumers' CSR perception has a significant positive effect on purchase intention, and environmental benefit perception plays a partial mediating role in this relationship. At the same time, CSR belief in CSR implementation (CSR-CA) and the overall environmental performance of the industry have a significant moderating effect on CSR effect. When consumers have a high trust in a company's ability or the industry has a good environmental performance, the impact of CSR behavior is more significant. However, the moderating effect of consumers' value orientation on the relationship between CSR and environmental benefit perception is not significant. The results of this study provide practical suggestions for enterprises to implement CSR strategies in different contexts, and emphasize the key role of enterprise capability belief and industry environmental performance in the effectiveness of CSR strategies.

With the increasing global environmental problems and Social inequality, Corporate Social Responsibility (CSR) has gradually become the focus of attention in the global business and academic circles. By implementing CSR activities, enterprises express their commitment to society, environment and ethics with the expectation that they can not only meet the expectations of society, but also gain market recognition[1,2]. However, whether CSR behaviors can significantly influence consumers' purchase intentions, and the channels and conditions of their impact remain controversial. Especially in countries with different values and cultural backgrounds, there may be significant differences in the influencing mechanism of CSR behaviors on consumers[3–6]. Most of the existing studies are based on the context of Western countries, while the value orientation and cultural background of East Asian countries are obviously different from those of western countries. Western countries are dominated by individualism and emphasize the primacy of individual interests. However, in the collectivist culture of East Asian countries, the public pays more attention to social responsibility and public interests, which may lead to their special understanding and response to CSR behaviors[7,8]. Therefore, this study aims to explore how CSR influences consumers' purchase intentions through their psychological mechanisms in the Chinese context.

Previous research on the impact of CSR on consumers' purchase intention has mostly focused on the direct relationship between CSR behavior and consumers' attitudes, and has obtained a lot of empirical suppor[9,10]. These studies generally based on the theory of social exchange theory and the signal that CSR behavior through the enhancement enterprise's reputation and image, directly to consumers to enterprise's positive evaluation

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and purchase intention. However, such studies mainly adopt the linear causality model, regard CSR behavior as a tool to enhance market image and consumer trust, and usually ignore the important role of consumers' internal psychological mechanism between CSR behavior and purchase intention[11,12]. This results in a lack of consistency in the effect of CSR across contexts and difficulty in explaining differentiated consumer responses to CSR behaviors.

In fact, consumers' reaction to CSR is a complex process, which often does not automatically generate positive evaluation only because of corporate CSR behaviors. Instead, consumers will judge the real motivation and potential benefits of CSR behaviors through a series of psychological evaluations. Studies have found that in the decision-making process, consumers not only pay attention to the corporate CSR behaviors themselves, but also evaluate the true meaning and credibility of CSR behaviors according to their personal belief system, values and judgment on the potential motivation of corporate behaviors[8,13]. Specifically, consumers tend to evaluate whether CSR behaviors are in line with their expectations of CSR through a series of internal psychological mechanisms. Consumers may question the motivation of CSR, especially when a company's behavior conflicts with its core business goals or is inconsistent in different situations, and the authenticity of such motivation will become an important factor affecting consumers' reactions[14].

This complex psychological evaluation process determines the level of consumer support for CSR and their behavioral responses. For example, consumers may subconsciously measure whether the enterprise CSR behavior has the real public welfare, or simply in order to improve the image of the enterprise and the surface of the action. With the deepening of consumers' understanding of social responsibility, they are more rational when evaluating corporate CSR behaviors, and gradually tend to focus on whether CSR activities have long-term benefits and social impact, rather than short-term corporate image building. Consumers, therefore, not only depends on the behavior itself, to the evaluation of CSR has a variety of individual characteristics and the adjustment of the faith, this also explains the different consumer groups and market background, the effect of CSR behavior will present a significant difference[15]. In addition, external contextual factors, such as industry environmental performance at the group level, may also have an impact on CSR effects. For example, the manufacturing industry may be considered to need more stringent CSR standards due to its high pollution characteristics, while the service industry may face different CSR expectations[16]. Therefore, this kind of environmental performance in different industries, as a group-level variable, may affect consumers' interpretation of corporate CSR behaviors, thus having an indirect impact on their purchase intention. Moreover, the interaction between individual and group-level factors has not been fully explored in existing research. Therefore, it is essential to further investigate their roles in shaping the impact of CSR on consumer behavior from a multilevel perspective. Based on this foundation, this study primarily addresses the following questions:

(a) How does consumer perception of corporate social responsibility (CSR) influence purchase intention?
(b) What role does environmental benefit perception play in mediating the relationship between CSR and purchase intention?
(c) How do value orientation and corporate ability belief (CSR-CA) moderate the impact of CSR on consumer behavior?

Based on this, This study proposes a multilevel research framework that includes Perceived CSR, Environmental Benefit Perception, Value Orientation, CSR-CA, Consumer Purchase Intention, and Industry Environmental Performance. Specifically, this study takes consumers' Perceived CSR as the starting point to explore the path through which it affects consumers' purchase intention through Environmental Benefit Perception. Value orientation is introduced as a moderator variable to explore the different responses of consumers with different value orientations to CSR behaviors. CSR-CA, as consumers' beliefs about the balance between corporate capability and responsibility, may moderate the impact of environmental benefit perception on purchase intention, further revealing the complex relationship between CSR behavior and consumer purchase intention. At the same time, this study also introduces industry environmental performance as a group-level moderator to examine its cross-level moderating effect on CSR effects.

The remainder of this study is structured as follows: "Literature review and hypotheses" section reviews the relevant literature on the key variables and presents the research hypotheses. "Research design" section outlines the research methodology, including data collection, measurement, and analytical approaches. "Empirical analysis" discusses the empirical findings and robustness tests. Finally, "Conclusion" section summarizes the study and provides managerial implications, theoretical contributions, and potential limitations.

Literature review and hypotheses
The impact of perceived CSR on consumers' purchase intention
In the current market environment that pays more and more attention to social responsibility, consumers not only pay attention to the quality and price of the product itself, but also care about whether the enterprise has undertaken social responsibility. Enterprises' CSR activities, such as reducing carbon emissions, supporting community development or promoting public welfare undertakescan enhance their brand image to a certain extent and enhance consumers' trust and goodwill towards enterprises[17]. According to the Social Exchange Theory, when consumers feel a company's goodwill and sense of social responsibility, they will think that purchasing the company's products is not only an economic transaction, but also a kind of return for the company's goodwill behavior[18]. This psychological mechanism makes consumers more willing to take practical actions to support enterprises when they perceive that enterprises have a high degree of social responsibility, which enhances their purchase intention.

At the same time, corporate social responsibility (CSR) can also stimulate consumers' psychological identity and sense of belonging. Studies have shown that consumers will consciously associate their purchasing choices

with their own moral values (such as supporting environmental protection and caring for vulnerable groups). Especially in the cultural background that emphasizes social responsibility, consumers tend to choose enterprises that can show a high degree of social responsibility[19]. In addition, consumers' positive perception of corporate CSR will enhance their emotional attachment to the enterprise, which will make it easier for them to form loyalty and preference for the brand. This not only increases the emotional connection between consumers and the brand, but also subtly enhances their purchase intention[20].

Existing research further supports the positive relationship between CSR and purchase intention. When enterprises can perform well in environmental protection and social welfare, consumers are generally more willing to support the products or services of these enterprises[21]. Such support is not based solely on the consideration of product features or price, but on consumers' moral identification with the corporate behavior. Consumers believe that by buying products from companies that perform well in CSR, they are also contributing to the sustainable development of society[22,23]. It can be said that the promotion effect of Perceived CSR on purchase intention is not only the return of consumers to the company's benevolent behavior, but also a part of the realization of consumers' self-ethical value. Therefore, based on previous research, this study proposes:

H1 Perceived CSR has a positive effect on consumers' purchase intention.

Environmental benefit perception as a mediator between perceived CSR and consumers' purchase intention

Environmental Benefit Perception refers to consumers' subjective perception of the environmental benefits brought by corporate CSR activities, which reflects whether CSR brings substantial value to the social environment. Studies have shown that environmental benefit perception plays a mediating role between Perceived CSR and purchase intention[24]. Specifically, when evaluating a company's CSR behavior, consumers will not only focus on whether the company has fulfilled its social obligations, but also consider the specific contribution of these behaviors in terms of environment. When consumers perceive that a company's CSR behavior has a positive impact on the environment (such as reducing carbon emissions or saving resources), this perception forms a substantial perception of environmental benefits, making CSR behavior no longer just a kind act on the surface, but a practical action that is really beneficial to the environment[25].

There is a profound psychological mechanism behind the mediating effect of environmental benefit cognition. Firstly, from the perspective of consumer motivation theory, consumers are often driven by intrinsic values and tend to support products or services that conform to their values. For example, if a brand's CSR behavior is considered to be beneficial to the environment, this behavior will stimulate consumers' environmental awareness, making the purchase of the brand's products a symbol of value expression[26]. In addition, consumers are often willing to support brands that are in line with their environmental values, which further satisfies their psychological needs and motivates their behaviors to be consistent with their beliefs. Therefore, environmental benefit perception helps consumers resonate with corporate CSR behaviors at the emotional level, making them view purchasing as support for environmental protection[27].

The existence of this mediating effect also highlights the deep impact of CSR strategies on consumer behavior. Corporate CSR activities not only enhance the brand image, but also stimulate the internal support of consumers through the perception of environmental benefits. This approach not only enhances consumers' purchase intention, but also integrates environmental responsibility into their consumption behavior. Environmental benefit recognition makes CSR no longer an independent behavior of enterprises, but a part of consumers' self-value realization[28]. Therefore, we propose the following hypothesis:

H2 Environmental benefit perception mediates the relationship between perceived CSR and consumers' purchase intention.

Moderating effect of CSR - CA

Corporate Social Responsibility - Corporate Ability Belief (CSR-CA) refers to consumers' perception of the extent to which a company's engagement in CSR activities signals its competence, innovation, and overall business capability[29,30]. This belief suggests that CSR is not only a moral commitment but also an indicator of a firm's ability to effectively manage resources, implement sustainable innovations, and maintain long-term competitiveness[31]. Based on this concept, consumers may perceive the relationship between CSR and corporate ability as either conflicting or mutually reinforcing[32]. When consumers have a strong belief in the enterprise's ability, that is, they believe that the enterprise still has high product quality and professional ability while pursuing social responsibility, then their awareness of the environmental benefits of the enterprise will be more converted into purchase intention. In other words, consumers not only pay attention to the environmental benefits brought by corporate CSR behaviors, but also care about whether these behaviors will weaken the core competence of enterprises. If consumers believe that enterprises can maintain or even enhance their core capabilities while fulfilling their social responsibilities, they will be more inclined to convert their perceptions of environmental benefits into actual purchase intentions. This belief not only strengthens their trust in the enterprise, but also makes them believe that the enterprise has sufficient resources to balance social responsibility and business ability, so as to avoid the compromise of quality or service when fulfilling CSR[17].

According to the resource-based view theory (RBV), a firm's competitive advantage comes from its unique and hard-to-imitate resources and capabilities. Resource-rich firms are able to effectively allocate their resources to socially responsible activities without affecting their core business[33]. When evaluating a company's CSR behavior, consumers actually subconsciously consider the company's ability to allocate resources -- if they believe that the company has sufficient resources and strong management capabilities, and will not weaken product quality or service level due to CSR investment, then they will have a higher recognition of CSR activities. And they are

more willing to support the enterprise's products or services[34]. In short, RBV tells us that consumers use a firm's resources and capabilities as a measure when judging CSR activities, and believe that well-resourced firms are able to effectively integrate CSR with their core business, thus enhancing the positive impact of environmental benefits on purchase intentions.

Conversely, when consumers believe that enterprises lack sufficient resources to support the balance between CSR and core business, they may doubt the authenticity of CSR or its actual benefits. In this case, even if they recognize the environmental benefits of enterprises, they may not directly translate into purchase intention, because they worry that enterprises' CSR activities may be at the expense of product quality[35]. Therefore, we propose the following hypothesis:

H3 CSR-CA will positively moderate the relationship between environmental benefit perception and purchase intention. that is, when consumers believe that corporate social responsibility and capability are promoting, environmental benefit perception has a greater impact on their purchase intention.

Moderating effect of value orientation

Value Orientation refers to the basic beliefs and codes of conduct held by individuals in social life, which affect their views and behavioral choices on themselves, others and society[36]. In this study, we divide value orientation into collectivism and individualism. Consumers with strong collectivism are more likely to view corporate CSR behavior as a contribution to society and the environment, so they are more likely to form a positive perception of their environmental benefits[37]. For such consumers, CSR behavior is not only a display of a company's self-image, but also an actual contribution to the overall well-being of society. This collectivist tendency makes it easier for them to associate CSR with environmental benefits, because part of their self-identity is derived from a sense of responsibility to society or the group[38].

This moderating effect can be understood in terms of the impact of an individual's value orientation on behavior interpretation. Consumers with strong collectivism tend to value the overall interests of society and pay attention to the impact of their behaviors on society or the environment. When they see companies performing their social responsibilities, they will more naturally interpret it as a positive contribution to society and associate it with environmental benefits[39]. This is because collectivists are usually more inclined to view problems from the perspective of the society as a whole, and agree that the interests of the group take priority over the interests of individuals, so they are more likely to accept and identify with the positive environmental effects brought by corporate CSR behaviors[40].

On the contrary, for consumers with strong individualistic tendencies, CSR behaviors may be more likely to be regarded as marketing means or image management of enterprises, focusing more on the direct interests of individuals rather than the interests of society as a whole. Their interpretation of CSR behavior is less from the perspective of environment or society, but more inclined to analyze whether the behavior is conducive to the satisfaction of their own needs[41]. As a result, even if they recognize corporate CSR behavior, they are often less likely to associate it with environmental benefits, because such behavior may not directly meet their personal needs.

To sum up, we believe that consumers with stronger collectivism are more likely to interpret CSR behaviors as positive contributions to society and the environment, so they are more likely to form positive perceptions of environmental benefits. On the other hand, consumers with strong individualism tend to pay more attention to their own interests and have relatively weak awareness of environmental benefits. This moderating effect reveals the deep influence of consumers' value orientation on CSR behavior interpretation, which makes consumers with different orientations have significantly different perceptions of CSR environmental benefits. Therefore, we propose the following hypothesis:

H4 Consumers' value orientation plays a positive moderating role in the impact of Perceived CSR on environmental benefit perception, that is, the more inclined consumers are to the value orientation of collective attention, the more they believe that corporate CSR behaviors are environmentally beneficial.

Moderating effect of industry environmental performance

Industry environmental performance refers to the actual performance of an enterprise in environmental protection and sustainable development, which usually includes specific environmental protection measures and results such as reducing pollution emissions, saving resources and improving energy efficiency[42,43]. Industry environmental performance reflects the overall environmentally responsible attitude and actions of enterprises within a given industry. As a key contextual indicator, it represents the level of collective commitment to environmental protection in the production and operation processes. A high level of industry environmental performance can enhance consumers' interpretation and trust in corporate CSR activities. When an enterprise demonstrates good environmental performance, consumers are more likely to believe that its CSR behavior is real and effective, which will enhance their perception of the environmental benefits of the behavior[44]. Environmental performance provides a quantitative and observable indicator for consumers, enabling them to more intuitively judge the authenticity and actual contribution of corporate CSR behaviors[45]. If an enterprise can prove that it has achieved substantial results in environmental protection, consumers will be more inclined to believe that the positive impact of its CSR behavior on the environment is credible, which will be more easily translated into support for the enterprise and purchase intention[13].

This moderating effect can be explained by the signaling theory. Good environmental performance conveys a strong positive signal to consumers, indicating that the enterprise is genuinely investing resources in fulfilling its CSR and generating real, measurable environmental impact. Such performance not only enhances the credibility of CSR, but also helps consumers to more actively associate CSR behaviors with environmental benefits, believing

that supporting the products or services of these enterprises is also supporting environmental protection[46]. Therefore, when a company's environmental performance is high, the positive impact of CSR perception on environmental benefit perception will be significantly enhanced, because consumers believe that a company's CSR is consistent with its actual environmental contribution. On the contrary, if the enterprise's environmental performance is low, even have a negative environmental records, consumers may doubt the accuracy of the enterprise CSR behavior, think these CSR activities is superficial rather than a genuine environmental protection measures[47]. In this case, even if the CSR behavior of consumers by the enterprise, may also be difficult to form a positive recognition of environmental benefits. Therefore, we propose the following hypothesis:

H5 Industry environmental performance positively moderates the relationship between perceived CSR and environmental benefit perception.

Figure 1 shows the model structure of this study:

Research design
Research methodology
This study used a questionnaire survey method combined with multilevel data analysis to explore how consumers' Perceived CSR affects their purchase intention through environmental benefit perception, and analyzed the moderating effect of environmental performance in different industries on this relationship. The research model uses Hierarchical Linear Modeling (HLM) to combine individual level consumer data with industry level environmental performance data, so as to deeply explore the interaction between individual and group variables in the multilevel data structure. This approach allows us to examine the effects of individual and group level variables and their interactions in different industry contexts. Although there was no direct organizational affiliation between individual respondents and the group-level data sources, we adopted an indirect matching approach. Specifically, each respondent's product category or self-identified brand affiliation was used to match them to corresponding industry-level environmental performance data, based on standard industry classification codes.

This approach follows established multilevel modeling practices in cases where individual data cannot be directly nested within identifiable units[49]. While this introduces a degree of inferential limitation, it allows for testing cross-level contextual influences in consumer perceptions.

Sample selection and data collection
Data were collected at two levels: individual level and group level. Data at the individual level were collected from a questionnaire survey aimed at consumers, which was mainly used to collect consumers' subjective evaluation of Perceived CSR, environmental benefit perception and purchase intention. Participants responded based on their overall impression of specific industries, including manufacturing, service, retail, finance and information technology. The questionnaires were distributed through the WJX online platform to ensure the breadth and diversity of the sample. The study design complies with the Declaration of Helsinki and was approved by the institutional review board at Wenzhou Polytechnic prior to its commencement (Approval Number: WZPT-EC-2023015). Before participating in the survey, all participants were informed of the study's purpose and relevant considerations. The formal questionnaire was only initiated after participants provided informed consent by clicking the agreement option on the WJX online platform. The questionnaire items can be referred to in the appendix.

Group-level data were collected from industry-level environmental performance indicators, including information disclosure, green management, public welfare activities, and pollution prevention and control in different industries. These data are collected through public databases and matched with the industries selected by consumers to construct industry-level environmental performance variables, so as to analyze the moderating effect of industry environmental performance on the relationship between variables at individual level.
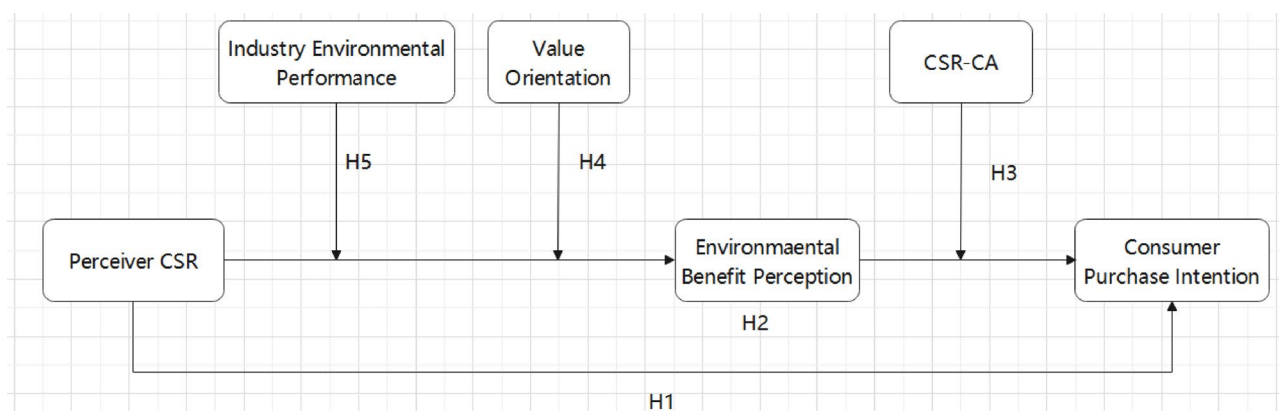

Fig. 1. Model structure.

Measurement of variables

Individual level variables include Perceived CSR[30]Environmental Benefit Perception[48]CSR-CA[29]Consumer Purchase Intention[50] and Value Orientation[51]. Perceived CSR was measured by four items, asking consumers about their overall evaluation of corporate CSR performance in a specific industry. Environmental benefit perception measures consumers' subjective perception of the positive environmental benefits of corporate CSR activities; CSR-CA measures whether consumers believe that enterprises still have high product quality and professional ability while fulfilling their social responsibilities; Consumer purchase intention measures consumers' support willingness based on their perception of CSR and environmental benefits. The measurement of individual value orientation focuses on the differences in consumers' collectivist or individualistic tendencies, especially their attitudes towards social responsibility and environmental protection. A five-point Likert scale (1 = strongly disagree, 5 = strongly agree) was used for all scales.

The variables at the group level mainly include the environmental performance indicators of the industry. Environmental performance is the most intuitive result representation of the effect of corporate environmental governance, which is manifested as the achievements of enterprises in protecting the environment and controlling pollution in the process of green development. Therefore, we measure the environmental performance of enterprises from four dimensions: information disclosure, green management, public welfare activities and pollution prevention and control[52]. These data reflect the overall performance of enterprises in different industries in environmental protection, and can represent the level of environmental management in different industries. The environmental performance data come from the ESG Performance Index of Chinese listed companies released by China Securities Co., LTD. In this paper, a total of 9 grades from C to AAA in the index are standardized to ensure the comparability of data among different industries. These environmental performance indicators will be used to analyze the moderating effect of environmental performance in different industries on consumers' CSR perception and purchase intention.

Since this study involves both individual-level and group-level data, we employed the following four methods to ensure the logical linkage between these hierarchical datasets:

(a) Industry Classification Consistency: Individual-level data were collected through surveys in which respondents selected the industry they were most concerned with (e.g., manufacturing). This industry label was then directly matched with the corresponding standardized industry-level scores from the ESG Performance Index of Chinese listed companies.
(b) Data Standardization: Industry-level environmental performance data were averaged by industry category and standardized using Z-score transformation to eliminate dimensional differences across industries.
(c) Multilevel Model Nesting: A hierarchical linear model (HLM) was employed, embedding individual-level variables (e.g., consumer CSR perception) within group-level variables (e.g., industry-level environmental performance) to examine cross-level moderating effects.
(d) Robustness Validation: The reliability of the matching logic was tested by substituting group-level variables (e.g., industry carbon reduction rates) and verifying the consistency of results (see sensitivity analysis).

Data analysis methods and procedures

Hierarchical regression and hierarchical linear models (HLM) were used for data analysis in this study to examine the relationships among consumers' Perceived CSR, environmental benefit perception and purchase intention, and to examine the moderating role of industry environmental performance in these relationships. In the HLM model, the group-level model (Level 2) uses industry environmental performance as a moderator to examine how it affects the strength and direction of the relationship between variables at the individual level. Model fitting indexes such as AIC and BIC were used to test the rationality of the model to ensure the explanatory power and robustness of the results. Additionally, to address the issue of uneven industry distribution in the individual-level data, we applied the Inverse Probability Weighting (IPW) method in the regression analysis. Specifically, each observation was assigned a weight based on the inverse of its industry sample proportion. This adjustment ensured that industries with lower representation received higher weights, thereby mitigating potential biases caused by sample imbalance. We then conducted a Weighted Least Squares (WLS) regression, utilizing these weights to estimate the effect of perceived CSR on purchase intention while maintaining the representativeness of all industries.

The research process was divided into five steps. First, formal consumer individual level data were collected through an online questionnaire, and group-level data on industry environmental performance were collected from publicly available databases. Then, the consumer data at the individual level were matched with the environmental performance data of the corresponding industry to construct a complete hierarchical dataset. In the third step, hierarchical regression analysis was used to verify the research hypotheses at the individual level, specifically including H1,H2,H3, and H4. In the fourth step, HLM was used to conduct hierarchical linear analysis to verify research hypothesis H5 and investigate the moderating effect of industry environmental performance on the relationship among CSR perception, environmental benefit perception and purchase intention. Finally, Bootstrap analysis and sensitivity analysis were used to verify the robustness of the HLM model.To assess multicollinearity, Variance Inflation Factors (VIFs) were calculated for all independent variables. Following common guidelines (Hair et al., 2016)[53]a VIF value below 5 was considered acceptable, indicating no serious multicollinearity.

Empirical analysis
Descriptive analysis and reliability and validity analysis
Descriptive statistical analysis was performed
In this study, individual level data were collected from October 2, 2023 to October 31, 2023. Finally, 447 responses were collected, of which 445 were validKey variables such as consumer perception of CSR, environmental benefit perception, and purchase intention were covered. Among them, 231 were male and 214 were female. The age of the sample ranged from 18 to 55 years old. Most of the respondents had high school education ($n = 124$) and college education ($n = 249$), and a small number had less than high school education ($n = 52$) and graduate education ($n = 20$). Most of the monthly income samples were in the range of 6001–8000 ($n = 261$) and 4001–6000 ($n = 132$). For the most concerned industry distribution, manufacturing ($N = 103$, 23.1%), service ($N = 101$, 22.7%), information technology ($N = 93$, 20.9%), retail ($N = 75$, 16.8%), and finance ($N = 73$, 16.4%).

The group-level data in this study are mainly used to measure the performance of different enterprises in terms of environmental performance, so as to explore the moderating effect of industry-level environmental performance on the relationship between consumer perception of CSR and environmental benefit cognition. In order to maintain the simplicity and accuracy of the data, the environmental performance data of the ESG Performance index of Chinese listed companies released by China Securities in 2023 were selected as the source of the group level indicators. According to the most concerned industries (Manufacturing, Service, Retail, Finance, Information Technology) in the questionnaire for the individual level, the data of 30 representative listed companies in these industries were selected.

From the descriptive analysis of group variables after standardization, it can be found that the manufacturing industry performs relatively well in the four dimensions of environmental performance, especially in pollution prevention and control and green management (the mean values are 3.89 and 3.75 respectively), which shows that the industry has a significant investment and practice in pollution reduction and environmental management. At the same time, the manufacturing industry is relatively transparent in terms of information disclosure (the mean value is 3.68). In contrast, the environmental performance of the service industry is relatively average in all dimensions, but the overall performance is slightly lower than that of the manufacturing industry, especially in information disclosure and pollution prevention and control (the mean values are 3.12 and 3.48 respectively), which indicates that further improvement is needed in these two dimensions. The retail sector scored the lowest in the dimension of public welfare activities (the mean value was 3.05), indicating that it was relatively weak in participating in public welfare activities, and the mean value of pollution prevention and control was also low (3.25), indicating that it still had a large room for improvement in reducing environmental impact. The financial industry performs well in information disclosure and green management (mean values are 3.50 and 3.60, respectively), indicating that the industry has certain advantages in information transparency and green management. However, the mean value of pollution prevention and control is low (3.33), indicating that it is insufficient in substantive pollution prevention and control. The information technology industry scored higher in green management and pollution prevention (mean values were 3.70 and 3.42, respectively), indicating that the industry is more prominent in environmental management, and also has a balanced performance in public welfare activities and information disclosure. In general, there are significant differences in the four dimensions of environmental performance among industries. Manufacturing industry is outstanding in pollution prevention and control and green management, while retail industry needs to improve in public welfare activities and pollution prevention and control. The overall performance of services and finance was relatively moderate, while the information technology industry performed well in green management and pollution prevention. The descriptive statistics in Table 1 lay the foundation for subsequent multilevel analysis and help further explore the moderating effect of industry environmental performance on the relationship between perceived corporate social responsibility and consumer environmental benefits perception and purchase intention.

Measurement model
In order to verify the individual level scale, the validity analysis of the individual level measurement scale was mainly conducted by using AMOS24 software. The validity test indexes of the scale were mainly based on the evaluation criteria proposed by Hair (2016)[53]. It mainly includes standardized item loading, composite reliability (CR), Cronbach's α coefficient and average variance extracted (AVE) of constructs. The analysis results confirmed the convergent validity of the measurement tools in this study. The reliability scores of variables exceeded 0.7, and the AVE scores exceeded 0.60. The standardized path loadings of all items were significant (t value > 1.96) and greater than 0.65, as shown in Table 2. Thus, each test result met its threshold criteria, supporting the convergent validity of the construct.

Industry	Disclosure (mean ± standard deviation)	Green management (mean ± standard deviation)	Public welfare activities (mean ± standard deviation)	Pollution prevention and control (mean ± SD)
Manufacturing	3.68 ± 0.81	3.75 ± 0.92	3.42 ± 0.85	3.89 ± 0.87
Service	3.12 ± 0.75	3.42 ± 0.84	3.15 ± 0.78	3.48 ± 0.90
Retail	3.22 ± 0.79	3.58 ± 0.83	3.05 ± 0.81	3.25 ± 0.88
Finance	3.50 ± 0.72	3.60 ± 0.86	3.22 ± 0.79	3.33 ± 0.85
Information Technology	3.60 ± 0.78	3.70 ± 0.80	3.28 ± 0.82	3.42 ± 0.83

Table 1. Descriptive statistical analysis of group variables after standardization.

Scales	Items	p	Cronbach's α	C.R.	AVE
Perceived CSR	PCSR1	**	0.784	0.86	0.78
	PCSR2	**	0.845		
	PCSR3	**	0.876		
	PCSR4	**	0.712		
Environmental benefit perception	EBP1	**	0.872	0.88	0.69
	EBP2	**	0.844		
	EBP3	**	0.765		
	EBP4	**	0.656		
Value orientation	VO1	**	0.789	0.84	0.66
	VO2	**	0.821		
	VO3	**	0.805		
	VO4	**	0.765		
CSR-CA	CSR-CA1	**	0.783	0.85	0.69
	CSR-CA2	**	0.824		
	CSR-CA3	**	0.805		
	CSR-CA4	**	0.765		
Consumer purchase intention	CPI1	**	0.715	0.79	0.74
	CPI2	**	0.727		
	CPI3	**	0.758		

Table 2. Confirmatory factor analysis. ** indicates $p < 0.01$.

	Mean	Standard deviation	1	2	3	4	5	6	VIF
1. Perceived CSR	3.82	0.96	1						1.71
2. Environmental benefit perception	3.75	0.78	0.50***	1					2.26
3. Value orientation	2.97	1.23	0.25*	0.38*	1				1.62
4. CSR-CA	3.38	0.85	0.55***	0.48***	0.30*	1			2.17
5. Consumer purchase intention	3.73	0.72	0.60***	0.50***	0.32*	0.55***	1		2.23
6.Industry environmental performance	3.21	0.89	0.15	0.18	0.13	0.22	0.19	1	1.05

Table 3. Correlation analysis and collinearity test. *** Indicates $p < 0.001$, * indicates $p < 0.05$. Correlations are Pearson coefficients (two-tailed). VIF values indicate no multicollinearity (all < 5).

The variance inflation factors (VIFs) of the five constructs were examined to validate the absence of multicollinearity. As shown in Table 3, all VIF values ranged from 1.05 to 2.26, well below the commonly accepted threshold of 5. These results confirm that multicollinearity was not a concern in this study.

Variable test at individual level

We tested the variable relationship at the individual level through hierarchical regression analysis. It mainly included the influence of Perceived CSR, Environmental Benefit Perception, Value Orientation and CSR-CA on Consumer Purchase Intention.

Model 1 only includes control variables (such as gender and age), and its main role is as a baseline model to observe the basic impact of control variables on Consumer Purchase Intention. The R-squared value of Model 1 is 0.172, indicating that only control variables can explain about 17.2% of the variation of consumer purchase intention. The influence of the control variables is relatively stable, which provides a basic comparison for the subsequent addition of other major variables.

In Model 2, we added the independent variable of Perceived CSR on the basis of the control variables to test the direct impact of Perceived CSR on Consumer Purchase Intention. The results show that Perceived CSR has a significant impact on Consumer Purchase Intention ($\beta = 0.242$, $p < 0.01$), and the R-squared value of the model rises to 0.216, which indicates that after the introduction of Perceived CSR, The explanatory power of the model increases by about 4%, indicating that consumers' perception of CSR has a significantly positive impact on their purchase intention. This result supports Hypothesis 1, which states that Perceived CSR has a significant positive impact on Consumer Purchase Intention.

In Model 3, we further added the mediating variable of Environmental Benefit Perception to test its mediating effect between Perceived CSR and Consumer Purchase Intention. The results show that the influence of Perceived CSR on Consumer Purchase Intention is still significant ($\beta = 0.215$, SE = 0.046, $p < 0.01$), although the coefficient of perceived CSR is slightly lower than that of Model 2. This indicates that Environmental Benefit Perception may play a partial mediating role between Perceived CSR and purchase intention. Environmental Benefit Perception had a significant impact on Consumer Purchase Intention ($\beta = 0.389$, SE = 0.040, $p < 0.01$).

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This indicates that consumers' environmental benefit perception of corporate CSR behavior will significantly improve their purchase intention. The R-squared value of the model increases from 0.216 in Model 2 to 0.237, indicating that the explanatory power of the model is improved after adding Environmental Benefit Perception, which can explain about 23.7% of the variation of purchase intention. The results of Model 3 further support Hypothesis 2, that is, Environmental Benefit Perception plays a partial mediating role between Perceived CSR and Consumer Purchase Intention.

We added CSR-CA as a moderator variable in Model 4 to test whether CSR-CA has a moderating effect on the relationship between perceived CSR and Consumer Purchase Intention. The results showed that the direct effect coefficient of CSR-CA was -0.086, SE = 0.061, which did not reach the level of significance. This shows that CSR-CA itself does not directly affect consumers' purchase intention, and consumers' belief in corporate responsibility and capability alone cannot significantly predict consumers' purchase intention. The influence coefficient of the interaction term of Environmental Benefit Perception × CSR-CA in Model 4 is 0.042, SE = 0.021, which is significant ($p < 0.05$). This indicates that CSR-CA significantly moderates the effect of Environmental Benefit Perception on Consumer Purchase Intention. Specifically, when consumers have higher beliefs about corporate responsibility and capability, environmental benefit perception has a stronger impact on consumer purchase intention. This shows that when consumers believe that enterprises have both responsibility and capability, they are more likely to increase their purchase intention because of the environmental benefit cognition of enterprises, which supports Hypothesis 3.

In Model 5, we take Value Orientation as a moderator variable to test its moderating role in the relationship between Perceived CSR and Environmental Benefit Perception. In Model 5, the direct influence coefficient of Value Orientation is β = 0.131, SE = 0.082, but it is not significant. This shows that consumers' value orientation itself has a weak direct impact on Environmental Benefit Perception, that is, value orientation alone is not enough to directly affect consumers' Environmental Benefit Perception. In addition, the coefficient of the interaction term of Perceived CSR × Value Orientation in Model 5 is β = 0.085, SE = 0.053, but it also does not reach the significance level. This shows that in this study, Value Orientation does not significantly regulate the impact of Perceived CSR on Environmental Benefit Perception. That is, the tendency of collectivism or individualism does not significantly affect consumers' perception of environmental benefit brought by CSR. Although theoretically we assume that value orientation may play a moderating role in this relationship, the empirical results show that this moderating effect is not significant in the current sample. Table 4 shows the results of hierarchical regression analysis, and Fig. 2 shows the simple slope analysis of Value Orientation as a moderator variable.

Group-level variable test

In the second model of this study, HLM was used to analyze the moderating effect of group variable Industry Environmental Performance on Perceived CSR and Environmental Benefit Perception. The role of the hollow model (Model 1) in the HLM analysis in Table 5 below is mainly to provide a benchmark, which enables us to understand the base mean level of the dependent variable and calculate the multilevel variance. The intercept term is 3.102 (SE = 0.051, $p < 0.001$) in Model 1, which represents the average level of Environmental Benefit Perception without the influence of other independent variables. Through the analysis of Model 1, we found that Model 1 has a significant inter-level variance, indicating that the difference between different groups is significant, and it is reasonable to use HLM.

| Variables | Consumer purchase intention | | | | | | | | | Environmental benefit perception | | |
	Model 1 (t-value)	SE	Model 2 (t-value)	SE	Model 3 (t-value)	SE	Model 4 (t-value)	SE	Model 5 (t-value)	SE	VIF
Perceived CSR	0.233*** 6.30	0.037	0.242*** 5.15	0.047	0.215*** (4.67)	0.046	0.195*** (4.53)	0.043	0.247*** (5.49)	0.045	1.71
Environmental Benefit Perception					0.389*** (8.84)	0.044	0.412*** (11.14)	0.037			2.26
CSR-CA							-0.086 (-1.41)	0.016			2.17
Environmental Benefit Perception × CSR-CA							0.042* (1.99)	0.021			1.98
Value Orientation									0.131 (1.59)	0.082	1.62
Perceived CSR × Value Orientation									0.085 (1.60)	0.053	1.45
Gender	0.335* (2.20)	0.152	0.322* (2.18)	0.148	0.343* (2.37)	0.145	0.316* (2.21)	0.143	0.21 (1.46)	0.144	1.03
Age	-0.022 (-0.30)	0.074	-0.021 (-0.29)	0.073	-0.026 (0.36)	0.072	-0.019 (-0.25)	0.076	-0.028 (-0.39)	0.071	1.02
Constant term	2.102** (2.69)	0.781	3.651*** (5.82)	0.627	3.126*** (4.86)	0.643	3.125*** (4.92)	0.635	3.115*** (4.81)	0.647	-
F	19.275**		19.272***		22.825***		24.108***		23.213***		
R²	0.172		0.216		0.237		0.296		0.221		

Table 4. Hierarchical regression analysis. ***Indicates $p < 0.001$, **indicates $p < 0.01$, and *indicates $p < 0.05$.
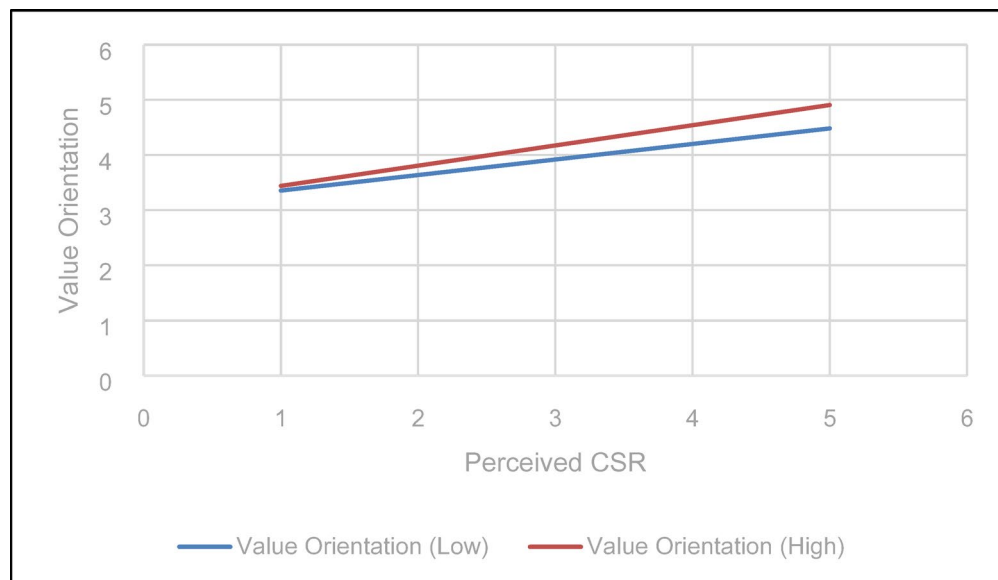
Fig. 2. Simple slope analysis.

Variables	Model 1 (t-value)	SE	Model 2 (t-value)	SE	Model 3 (t-value)	SE	
	Empty model		**Random intercept**		**Random slope**		**VIF**
Intercept term	3.102*** (60.82)	0.052	3.085*** (68.86)	0.045	3.072*** (73.14)	0.042	–
Perceived CSR			0.393*** (6.34)	0.062	0.367*** (6.92)	0.053	1.02
Industry environmental performance					0.086 (1.34)	0.064	1.05
Perceived CSR × industry environmental performance					0.156* (2.20)	0.071	1.07
Model			**AIC**		**BIC**		
Empty model			1250.3		1265.1		
Random intercept model			1220.8		1240.4		
Random slope model			1205.4		1229.8		

Table 5. Hierarchical linear model (HLM) analysis. ***Indicates $p < 0.001$, *indicates $p < 0.05$.

In Model 3 (random slope model), we further add Industry Environmental Performance and its interaction term with Perceived CSR on the basis of previous model. The results show that Perceived CSR has a significantly positive impact on Environmental Benefit Perception ($\beta = 0.367$, $p < 0.001$). It indicates that consumers' Perception of CSR significantly improves their Environmental Benefit Perception. In addition, the direct impact of Industry Environmental Performance on consumers' Environmental Benefit Perception is not significant ($\beta = 0.086$, $p > 0.05$). However, the interaction term of Perceived CSR × Industry Environmental Performance had a significant impact on Environmental Benefit Perception ($\beta = 0.156$, $p < 0.05$). It indicates that industry Environmental performance plays a moderating role between Perceived CSR and Environmental Benefit Perception. Specifically, when the overall Environmental performance of the industry is high, the positive impact of Perceived CSR on Environmental Benefit Perception is stronger, which indicates that consumers will consider the CSR behavior of enterprises with good environmental performance evaluation to be credible. The AIC and BIC values of Model 3 further decrease, indicating that the model's fitting degree is improved compared with the previous model, thus enhancing the explanatory power of consumers' purchase intention. Table 5 shows the results of hierarchical linear model (HLM) analysis, and Fig. 3 shows the simple slope analysis of Industry Environmental Performance as moderator variable.

Robustness test

Considering that our study uses both individual-level variables and group-level variables, we need to test the robustness of the model. From the results of Bootstrap analysis in Table 6, it can be found that the effects of most core variables are significant and stable in the Bootstrap analysis, which verifies the robustness of the model. The positive impact of Perceived CSR and Environmental Benefit Perception on consumers' purchase intention is
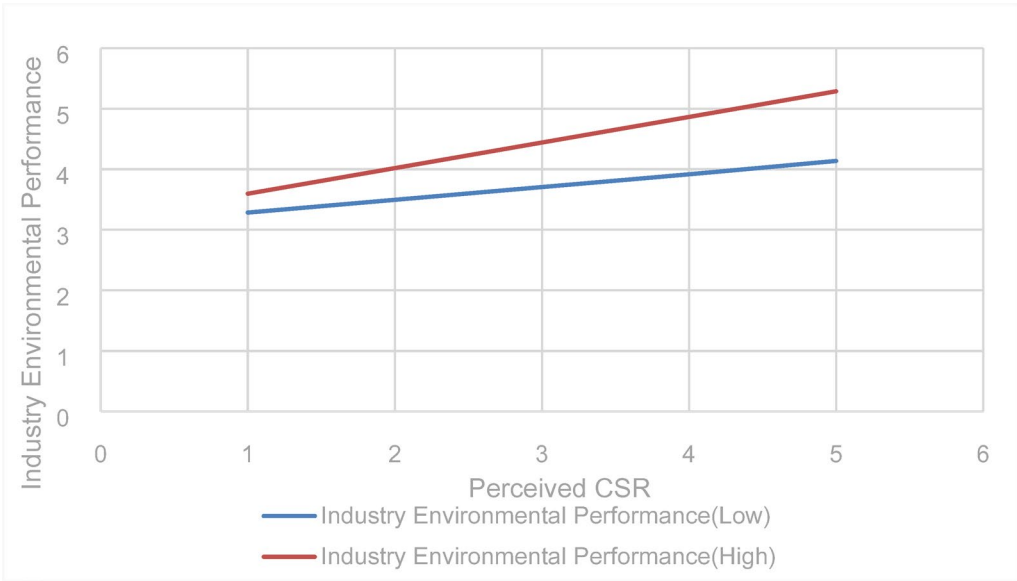
Fig. 3. Simple slope analysis.

Variables	Raw coefficients	Bootstrap average coefficients	Bootstrap SE	95% confidence interval	Result
Perceived CSR	0.364	0.356	0.064	[0.244, 0.465]	Significance
Environmental Benefit Perception	0.454	0.434	0.074	[0.301, 0.565]	Significance
Industry Environmental Performance	0.081	0.097	0.156	[-0.104, 0.287]	Not Significance
Perceived CSR × Industry Performance	0.156	0.143	0.091	[0.012, 0.271]	Significance

Table 6. Bootstrap analysis results (based on random slope model).

Variables	Raw coefficients	Bootstrap average coefficients	Bootstrap SE	95% confidence interval	Result
Perceived CSR	0.364	0.356	0.064	[0.244, 0.465]	Significance
Perceived CSR × Industry environmental performance	0.156	0.143	0.091	[0.012, 0.271]	Significance
Alternative industry indicator (carbon emission reduction rate)	0.085	0.091	0.131	[-0.09, 0.272]	Not significant
Perceived CSR × carbon reduction rate	0.153	0.139	0.097	[0.00, 0.263]	Marginal significant

Table 7. Sensitivity analysis results (replacing industry environmental performance with carbon emission reduction rate).

still significant after repeated sampling, which indicates that consumers' perception of CSR and environmental benefit both have a continuous positive impact on their purchase intention. However, Industry Environmental Performance itself has no direct impact on Environmental Benefit Perception. However, it plays a significant moderating role in the relationship between Perceived CSR and Environmental Benefit Perception. These results show that the model is stable under different sampling conditions, and there is no significant deviation in the effect of key variables.

Considering that the variable Industry Environmental Performance at the group level may have the problem of measurement error, we use sensitivity analysis to verify whether the conclusions of the model are consistent under different indicators. The Industry Carbon Reduction Rate variable is used as a proxy variable at the group level to re-test the model results. From the sensitivity analysis results in Table 7, it can be found that the core relationship of the model remains robust after Industry Environmental Performance is replaced by Carbon Reduction Rate. In the analysis after replacing the variables, Perceived CSR and Environmental Benefit Perception continue to show a significant positive impact on Environmental Benefit Perception. This further confirmed the key driving effect of CSR and Environmental Benefit Perception on environmental benefit perception. This shows that even under different Environmental performance measures, the positive effect of CSR on Environmental Benefit Perception still has strong consistency. At the same time, the moderating

Hypothesis	Assumed content	Result
Hypothesis 1	Perceived CSR will positively affect consumers' perception of environmental benefits	Accepted
Hypothesis 2	Environmental benefit perception plays a mediating role between Perceived CSR and consumers' purchase intention	Partial mediation
Hypothesis 3	Corporate capability belief (CSR-CA) will positively moderate the relationship between environmental benefit perception and purchase intention	Accepted
Hypothesis 4	Consumers' value orientation plays a positive moderating role in the impact of CSR perception on environmental benefit perception	Rejected
Hypothesis 5	Industry environmental performance positively moderates the relationship between perceived CSR and environmental benefit perception.	Accepted

Table 8. Results of hypothesis testing.

effect still appears in the analysis after replacement. Although the interaction term of Perceived CSR × Carbon Reduction Rate is only marginally significant, its effect direction and trend are consistent with the results when the industry environmental performance is used as the moderating variable. This shows that Environmental performance has a similar moderating effect on the process of CSR affecting Environmental Benefit Perception, which further supports the robustness of the model results, regardless of whether industry environmental performance or carbon emission reduction rate is used.

Finally, to address potential biases caused by the uneven distribution of individual-level data across industries, we conducted a robustness check using a balanced subsample regression approach. Specifically, we randomly selected an equal number of observations ($n=70$) from each of the five industries (manufacturing, service, retail, finance, and information technology), constructing a balanced subsample dataset with a total of 350 observations. We then re-ran the regression analysis on this balanced subsample to examine whether the results remained consistent with those from the full sample analysis. The findings indicate that the effect of Perceived CSR on Purchase Intention and the mediating role of Environmental Benefit Perception remained statistically significant, with direction and magnitude consistent with the full sample results. This suggests that the uneven industry distribution at the individual level did not significantly distort the research findings.

In this study, hierarchical regression analysis and linear regression model were used to empirically analyze the hypotheses of the study. The verification of the hypotheses is shown in Table 8 below.

Conclusion
Discussion
This study explored the relationship between perceived CSR, environmental benefit perception and consumer purchase intention, and constructed a complex theoretical multilevel model to examine the role of mediating and moderating variables. The results show that perceived CSR has a significant positive impact on consumers' purchase intention, which is consistent with the findings of previous literature[54,55]and further verified the key role of CSR in shaping consumer behavior. Perceived CSR strengthens the corporate social responsibility image in the public mind by changing consumers' cognition of corporate environmental behavior, thus indirectly affecting consumers' purchase intention[56]. This finding is not only consistent with existing research[57]but also further expands the theoretical framework of CSR, especially in the role of environmental benefit perception as a mediating variable, and enhances our understanding of how CSR affects consumer behavior at a deeper level.

We also found that environmental benefit perception played a partial mediating role between perceived CSR and consumers' purchase intention, further emphasizing the importance of environmental benefit perception in CSR effects. Corporate capability belief (CSR-CA) also plays a positive role in moderating the relationship between environmental benefit perception and consumers' purchase intention and influencing their purchase intention. Based on the existing research, these findings further verify the importance of enterprises' capability in CSR communication[58]especially in the process of enhancing consumers' awareness of environmental benefits, the enterprise's capability belief is obviously a key factor. This study provides a more practical strategy for enterprises to implement CSR strategy, that is, enterprises should focus on improving consumers' cognition of their capabilities, so as to enhance the overall effect of CSR activities.

In addition, the results of this study also provide some challenges and extensions to existing theories. Firstly, we verified the positive moderating effect of Environmental Performance on the relationship between perceived CSR and environmental benefit perception, which is different from the earlier research that questioned the impact of environmental performance[59]. We found that the actual environmental performance of enterprises has a significant impact on consumers' environmental perception, which may reflect consumers' increasing concern for environmental protection and their sensitivity to enterprises' performance in environmental management. Therefore, enterprises' emphasis on environmental performance in CSR activities not only helps to shape the corporate image of social responsibility, but also helps to improve consumers' recognition of their environmental contribution, which in turn enhances consumers' purchase intention. This finding extends the application of CSR research in the environmental field, indicating that consumers increasingly pay attention to the actual actions of enterprises rather than pure corporate statements. On the other hand, regarding the moderating effect of consumer value orientation on the relationship between perceived CSR and environmental benefit perception, our results failed to test this hypothesis, indicating that the moderating effect of value orientation on the impact of CSR perception on environmental benefit perception is relatively weak. This finding is different from the moderating effect of consumer values on CSR effect mentioned in some literature[60]. We believe that this difference may be due to the different cultural background of the samples, or the value orientation of consumers will show a stronger moderating effect only in a specific situation or when it interacts with other psychological variables.

By constructing a multilevel model, this study systematically reveals the complex mechanism of CSR influencing consumers' purchase intention, and enriches the theoretical framework of CSR. Different from previous studies that only explored the direct relationship between CSR behaviors and consumer attitudes, this study introduced environmental benefit cognition as a mediating variable, and value orientation and industry environmental performance as moderating variables, to deeply analyze the psychological process of consumers in evaluating CSR behaviors from a multi-dimensional perspective. The empirical results show that CSR has a significant impact on purchase intention under the dual regulation of individual characteristics and industry environment, especially under the interaction of environmental benefit cognition, CSR-CA and industry environmental performance, the effect of CSR is more significant. This finding not only expands the application situation of CSR theory, but also provides practical guidance for enterprises to optimize CSR strategies in different market environments. It is suggested that enterprises should demonstrate their business capabilities while conveying social responsibility, and pay attention to the overall environmental performance of the industry, so as to effectively enhance the market influence of CSR.

Implications for management

This study provides significant managerial implications by demonstrating that CSR is most effective when considered in conjunction with environmental benefit perception, consumer purchase intention, value orientation, and corporate capability belief. While CSR initiatives can enhance corporate reputation, their impact on consumer behavior depends largely on how consumers perceive the actual environmental benefits derived from these initiatives. Managers must ensure that CSR strategies are not just symbolic but are backed by tangible environmental improvements. Transparent reporting, third-party certifications, and clear communication of sustainability efforts can help bridge the gap between CSR perception and actual consumer engagement.

Understanding consumer purchase intention is crucial in the implementation of CSR strategies. Simply engaging in CSR is not sufficient; firms must align these initiatives with consumer expectations and preferences to drive purchasing behavior. Consumers respond positively when they perceive direct value from CSR efforts, whether in terms of product quality, environmental sustainability, or ethical responsibility. Integrating CSR into marketing and branding strategies ensures that these efforts are visible, relatable, and capable of fostering long-term consumer loyalty. Additionally, companies should segment their market based on value orientation, recognizing that different consumers weigh ethical considerations and functional benefits differently. Businesses targeting socially conscious consumers should emphasize moral and sustainability aspects, while those appealing to pragmatic consumers should highlight the cost-effectiveness and utility of CSR-driven innovations.

Corporate capability belief further plays a crucial role in strengthening consumer trust in CSR initiatives. Consumers are more likely to support companies that not only engage in CSR but also demonstrate the capacity to execute these initiatives effectively. Firms with strong technological and operational capabilities should leverage these strengths to reinforce their CSR commitments. For instance, companies investing in green technology should communicate their advancements to consumers, positioning themselves as industry leaders in sustainability. By strategically integrating CSR with environmental benefit perception, purchase intention, value orientation, and corporate capability belief, firms can enhance both their social impact and competitive advantage, leading to stronger consumer trust and market performance.

Research limitations and future research directions

Although this study provides many new findings and contributions, several limitations remain. First of all, the samples of this study are mainly from specific regions, and future research can be extended to consumers in different cultural backgrounds to verify the universality of the research results. Secondly, although we explored multiple moderating and mediating variables, there are still many possible variables that have not been included, such as consumers' moral cognition and brand trust. Future research can further explore the role of these factors in CSR effects. Third, although this study employs a multilevel modeling approach, there is no direct nesting between individual- and industry-level data, which may limit the precision of cross-level interpretations. Future research could improve this by collecting data from consumers directly affiliated with specific firms or industries.

In conclusion, this study not only deeps our understanding of the relationship between perceived CSR and consumer behavior, but also provides specific suggestions for companies to implement CSR strategies, especially strategies to improve environmental performance, shape consumer perceptions of environmental benefits, strengthen the shaping of altruistic attribution, and enhance corporate capability beliefs. It is hoped that future research will further validate our findings and explore more complex mechanisms and variables to promote the development and practical application of theories in the field of CSR.

Data availability

The data that support the findings of this study are available from the corresponding author, [Ma], upon reasonable request.

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Author contributions

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Declarations

Competing interests

The authors declare no competing interests.

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