

Environmental Responsibility Perception and Corporate Green Strategy: The Conditional Moderating Role of Organizational Resilience and the Limited Mediating Effect of ESG Governance

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Abstract: Grounded in environmental psychology and social identity theory, this study investigates the psychological mechanisms through which managerial environmental responsibility perception (ERP) drives corporate green strategy (GS). Environmental psychology research has established that pro-environmental behavior is fundamentally driven by cognitive-affective processes, yet the application of these principles to organizational strategic behavior remains underdeveloped. This study conceptualizes ERP as a multidimensional psychological construct encompassing cognitive awareness of environmental issues, affective concern reflecting emotional responses, and conative readiness representing behavioral intentions. Based on panel data comprising 2,058 firm-year observations from 382 Chinese A-share listed companies during 2018-2023, two-way fixed effects models with cluster-robust standard errors and 5,000-iteration Bootstrap mediation analysis were employed. Results indicate that ERP significantly promotes GS ($\beta = 0.0134$, $p < 0.01$), confirming that managerial environmental cognition serves as the primary psychological driver of organizational sustainability transformation. In heavy-polluting industries where environmental identity salience is elevated, the effect magnitude increases by 2.05 times, providing empirical support for social identity amplification mechanisms. Organizational resilience exhibits a conditional moderation effect, indicating that collective efficacy resources function as a necessary yet insufficient condition for perception-to-action translation. Furthermore, the direct cognitive-behavioral pathway assumes predominance (92.2%), substantially exceeding the ESG-mediated institutional channel (7.8%), revealing that authentic environmental cognition bypasses formal governance mechanisms to directly drive strategic behavior. This study extends environmental psychology from individual behavior to organizational strategy, demonstrating that managerial psychological processes fundamentally shape corporate sustainability outcomes.

Keywords: Environmental responsibility perception; Environmental psychology; Social identity theory; Corporate green strategy

1. Introduction

Against the backdrop of global climate change, corporate environmental behavior plays a critical role in achieving sustainable development goals. Traditional research has predominantly explained corporate green strategy from the perspective of institutional pressures; however, strategic decisions fundamentally originate from the cognitive processing of decision-makers, with external environmental signals requiring perception and interpretation by managers before being translated into organizational action [1]. Environmental psychology research has revealed that pro-environmental behavior is driven



by cognitive-affective processes, yet the applicability of this principle at the organizational strategic level remains to be systematically examined.

Environmental responsibility perception, as an integrative psychological construct, encompasses decision-makers' cognitive awareness of environmental issues, affective concern, and behavioral intentions [2]. Social identity theory indicates that when managers incorporate environmental responsibility into their professional identity, identity-consistency motivation drives corresponding strategic behavior [3]. In heavy-polluting industries where environmental issues hold high salience for organizational identity, managers face stronger identity pressure, resulting in a tighter linkage between environmental perception and strategic behavior [4]. Value-belief-norm theory elucidates, from a moral psychology perspective, the causal mechanism through which values activate behavior via environmental beliefs [5], with moral emotions such as anticipated guilt playing an important mediating role in this process [6].

The translation of individual environmental cognition into organizational action requires the support of collective psychological resources, with organizational resilience potentially playing a critical facilitative role in this process [7]. Empirical research demonstrates that executive green cognition positively predicts corporate ESG performance [8], ESG performance exerts a promoting effect on green innovation [9], and executive green cognition can also suppress corporate greenwashing behavior [10]. Existing research exhibits the following limitations: environmental psychology has primarily focused on individual consumer behavior, with the applicability of the cognitive-affective-behavioral model at the organizational strategic level lacking systematic examination; corporate environmental strategy research has emphasized external institutional factors, with the explanatory power of intrinsic psychological dynamics remaining insufficiently explored; how organizational psychological resources moderate the translation of managerial cognition into organizational action warrants further investigation; and the relative importance of direct psychological pathways versus institutional mediation pathways has yet to receive empirical comparison.

Grounded in environmental psychology and social identity theory, this study constructs a psychological mechanism model of managerial environmental responsibility perception driving corporate green strategy. Employing panel data from Chinese listed companies during 2018-2023, two-way fixed effects models and Bootstrap mediation analysis are utilized for empirical testing. The research contributions are threefold: extending the cognitive-affective-behavioral framework from individual behavior to the organizational strategic level; introducing organizational psychological resilience as a boundary condition for perception-to-action translation; and quantifying the relative contributions of the direct psychological pathway versus the institutional mediation pathway to reveal the primacy of authentic psychological commitment in corporate environmental behavior.

2. Theoretical Framework and Research Hypotheses

2.1. Environmental Responsibility Perception and Corporate Green Strategy

Environmental responsibility perception, as a multidimensional psychological construct, is rooted in the cognitive-affective-behavioral theoretical framework of environmental psychology, encompassing managers' cognitive awareness of environmental issues, affective concern for ecological risks, and conative readiness to undertake environmental protection actions. This construct transcends mere environmental knowledge or attitude measurement, capturing the deep psychological dynamics that drive strategic behavior and reflecting how managers psychologically process, interpret, and respond to environmental issues. The cognitive dimension involves managers' awareness and understanding of climate change risks, organizational environmental impacts, and stakeholder environmental expectations; the affective dimension encompasses concern, anxiety, guilt, and moral emotional responses toward environmental issues; and the conative dimension represents the psychological readiness state for allocating resources and undertaking environmental actions. Systematic reviews of the psychological determinants of pro-environmental behavior indicate that psychological variables such as attitudes, norms, perceived control, and values can effectively predict environmental behavioral tendencies [11], providing theoretical support for the psychological foundation of the environmental responsibility perception construct.

Value-belief-norm theory provides a complete psychological causal chain for elucidating how environmental responsibility perception activates green strategic behavior, proposing that personal values activate personal norms through the mediating effects of ecological worldview, awareness of consequences, and ascription of responsibility, which in turn drive pro-environmental behavior [12]. Cross-cultural research encompassing samples from 37 countries has validated the universality of this theoretical framework, finding that value and belief variables can effectively predict pro-environmental

behavior across different socioeconomic and cultural contexts. Moral emotions play a critical role in this psychological transformation process, with comparative research on guilt and pride as two moral emotions revealing that anticipated guilt, as a prospective moral emotion, can consistently and stably stimulate pro-environmental behavioral intentions. Research on the mechanisms through which negative moral emotions stimulate pro-environmental behavior further confirms that guilt induction can effectively activate environmental protection motivation [13]. Applying these psychological mechanisms to organizational contexts, managers with stronger environmental responsibility perception identify with the importance of environmental protection at the value level, experience anticipated guilt regarding environmental negligence at the affective level, and demonstrate psychological readiness to undertake green strategic actions at the behavioral level, with this cognitive-affective-conative psychological sequence constituting the intrinsic driving force for corporate green strategy. Accordingly, the following hypothesis is proposed:

H1: Environmental responsibility perception has a significant positive effect on corporate green strategy.

2.2. The Moderating Effect of Organizational Resilience

The theory of planned behavior emphasizes the critical moderating role of perceived behavioral control in the translation between behavioral intentions and actual behavior, proposing that even when individuals hold positive behavioral attitudes and subjective norms, the translation from intention to action may still be impeded if efficacy beliefs regarding successful behavior execution are lacking [14]. Systematic reviews of this theory's application in the pro-environmental behavior domain have confirmed the complementary efficacy of attitudes, subjective norms, and perceived behavioral control as three elements in predicting environmental behavior [15]. The perceived behavioral control dimension is closely related to the concept of self-efficacy, with recent theoretical developments on efficacy beliefs proposing a three-dimensional framework encompassing competence efficacy, means efficacy, and coping efficacy [16], providing more refined analytical tools for understanding managers' subjective capability assessments in implementing green strategy. Research on climate anxiety and eco-paralysis phenomena has revealed the critical moderating function of self-efficacy between emotions and behavior [17], suggesting that insufficient efficacy beliefs may impede the effective translation of environmental perception into action.

Organizational resilience represents collective-level efficacy beliefs and adaptive capacity, encompassing organizational members' shared confidence in successfully addressing challenges, the collective ability to coordinately adapt to changing conditions, and the psychological flexibility to learn and grow from adversity. Research on the supportive role of leadership styles and organizational values in organizational resilience building indicates that transformational and servant leadership behaviors can effectively promote the development of collective resilience [18]. Studies on the mechanisms through which servant leadership influences employee resilience have found that perceived organizational support plays a mediating role [19], suggesting that supportive organizational psychological climates facilitate enhanced perception-to-action translation efficiency. Recent advances in employee resilience research have systematically reviewed the antecedents, processes, and outcomes of resilience as both individual and organizational resources [20], providing theoretical grounds for understanding the boundary condition role of resilience in environmental strategy formation. Research on the relationship between emotional intelligence and resilience has revealed synergistic effects among psychological resources [21], while cross-level research on authentic leadership and employee resilience has elucidated how leadership traits influence the psychological resource allocation of organizational members [22]. Based on the foregoing analysis, organizations with higher levels of organizational resilience possess stronger collective efficacy beliefs and change adaptation capabilities, enabling more effective translation of managerial environmental responsibility perception into coordinated green strategic action. Accordingly, the following hypothesis is proposed:

H2: Organizational resilience positively moderates the relationship between environmental responsibility perception and corporate green strategy, such that the stronger the organizational resilience, the more pronounced the promoting effect of environmental responsibility perception on corporate green strategy.

2.3. The Mediating Effect of ESG Governance Mechanisms

Social identity theory provides an important psychological explanation for understanding the translation of environmental responsibility perception into institutionalized behavior, proposing that when individuals integrate specific group membership into their self-concept, maintaining group image and enhancing group status become core motivations driving behavior. Meta-analytic integration of

extensive empirical evidence on the relationship between social identity and pro-environmental behavior confirms a robust positive association between group identification levels and environmental behavioral tendencies [23]. Experimental research on the interaction effects of information framing and social identity demonstrates that the activation of identity salience can significantly strengthen the influence of environmental information on behavioral intentions. Research on the formation process of pro-environmental social identity reveals how environmental identity is progressively constructed through participation in environmental practices [24], while studies on the influence of cultural and educational factors on environmental identity development among younger generations emphasize the enduring effects of early environmental socialization experiences [25]. Recent developments in the social identity approach within the climate change psychology domain have integrated core concepts including identity, norms, and collective efficacy [26], providing a theoretical framework for understanding how environmental identity mobilizes collective action.

Social norms, as important social psychological factors influencing environmental behavior, operate through two pathways: descriptive norms and injunctive norms. Systematic reviews of norm research indicate that social norm information can effectively promote various pro-environmental behaviors [27], while theoretical reviews on the role of norms in pro-environmental behavior further elucidate the design principles for normative interventions [28]. ESG governance mechanisms, as the institutionalized expression of corporate environmental identity, provide organizational-level legitimacy carriers for managerial environmental identification. Research on the incentive effects of ESG information disclosure quality on green innovation [29] reveals the information transmission function of institutional mechanisms, while studies on the promoting effects of ESG performance on corporate green innovation confirm the supportive role of institutional safeguards for strategic behavior. Research demonstrating that executive green cognition influences green technology innovation through ESG performance provides empirical support for the pathway through which psychological factors affect strategic outcomes via institutional channels. Accordingly, the following hypothesis is proposed:

H3: ESG governance mechanisms mediate the relationship between environmental responsibility perception and corporate green strategy.

2.4. Theoretical Integration and Research Contributions

This study integrates the cognitive-affective-behavioral model, social identity theory, and the theory of planned behavior to construct a psychological mechanism framework explaining how environmental responsibility perception drives corporate green strategy. The cognitive-affective-behavioral model elucidates the multidimensional psychological structure of environmental responsibility perception and the intrinsic logic of its translation into behavior; social identity theory explains how managerial environmental identification obtains organizational legitimacy through institutionalized ESG expression; and the theory of planned behavior reveals how organizational resilience, as collective efficacy beliefs, moderates perception-to-action translation efficiency.

Compared with existing research, this study achieves a shift in theoretical perspective from external institutional pressures to internal psychological dynamics, with research on the suppressive effect of executive green cognition on corporate greenwashing behavior supporting the shaping role of authentic psychological commitment on the authenticity of strategic behavior. In the dimension of resilience function, this study repositions organizational resilience from an outcome variable to a boundary condition, revealing its context-dependent characteristic as a "necessary yet insufficient condition." In the dimension of pathway mechanisms, this study compares the relative contributions of direct psychological pathways versus institutional mediation pathways. Theoretical progress reviews of pro-environmental behavior research have systematically documented the research trend of extending from individual behavior to organizational behavior, while social psychological research on collective responses to global challenges emphasizes the necessity of transcending individual behavior change to achieve collective action coordination [30]. Table 1 compares the differences between the existing studies and this study.

Table 1. Comparison of Theoretical Contributions Between This Study and Existing Literature

Dimension	Existing Research	This Study	Theoretical Advancement
Theoretical Framework	Environmental psychology focused on individual consumer behavior; Corporate strategy research emphasized external institutional pressures	Integrates cognitive-affective-behavioral model, social identity theory, and theory of planned behavior	Extends environmental psychology from individual behavior to organizational strategic decision-making level
Analysis Level	Individual pro-environmental behavior; Organizational ESG performance as outcome variable	Managerial psychological processes as primary driver of corporate green strategy	Bridges micro-level psychological dynamics with macro-level strategic outcomes
Resilience Function	Organizational resilience as outcome variable or direct predictor	Organizational resilience as boundary condition with threshold effects (OR < 0.221)	Repositions resilience as "necessary yet insufficient condition" for perception-to-action translation
Pathway Mechanisms	Assumed institutional mediation as primary channel; Limited comparison of pathway contributions	Quantifies direct psychological pathway (92.2%) vs. institutional mediation pathway (7.8%)	Reveals primacy of authentic psychological commitment over formal governance mechanisms
Industry Context	Limited attention to identity salience variations across industries	Effect magnitude 2.05× greater in heavy-polluting industries	Provides empirical support for social identity amplification in high-salience contexts

Synthesizing the foregoing analysis, the theoretical model constructed in this study encompasses the following core pathways: environmental responsibility perception directly drives green strategy through the cognitive-affective-conative psychological sequence, while simultaneously indirectly influencing strategic outcomes through the institutionalized channel of ESG governance mechanisms; organizational resilience, as collective efficacy beliefs, moderates perception-to-strategy translation efficiency; and social identity processes exert amplification effects in industry contexts where environmental identity salience is elevated. The theoretical innovations of this study are manifested in three aspects: extending the cognitive-affective-behavioral framework of environmental psychology from individual pro-environmental behavior to the organizational strategic decision-making level; introducing organizational resilience as a collective efficacy boundary condition to reveal the organizational psychological resource dependency of perception-to-action translation; and highlighting the primacy of authentic psychological commitment in corporate environmental behavior by comparing the relative importance of direct psychological pathways versus institutional mediation pathways. The theoretical model is illustrated in Figure 1.

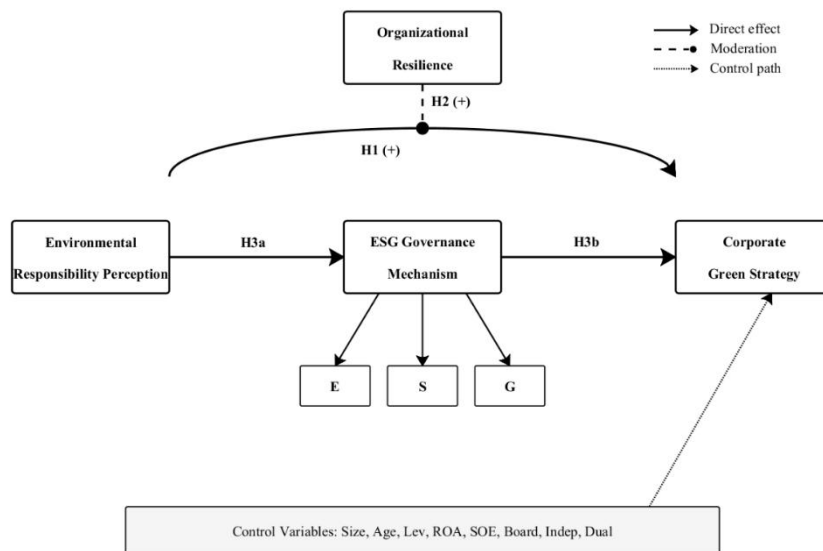


Figure 1. Framework diagram of the theoretical model

3. Data and Methods

3.1. Sample Selection and Data Sources

Sample Selection: The study selects non-financial Chinese A-share listed companies for the research, with the sample period spanning from 2018 to 2023. Sample selection criteria consider the exclusion of ST/*ST/PT, finance, and missing key variables. Finally, the study is left with a total of 382 firms and 2,058 firm-year observations.

The criteria for the sample selection are presented below: the sample excludes companies with ST, *ST, or PT financial problems, financial insurance companies, observations with missing data for the important variables, and companies with less than one year of listing. To further prevent the effect of outliers, the top and bottom 1% of each variable are truncated (Winsorized). After the aforementioned removal, the total number of annual samples for the enterprises was derived to be 2058, including 382 enterprises. The industry distribution is shown in Table 2.

Table 2. Distribution of Sample Industries

Industry category	Number of enterprises	Percentage (%)	Is there heavy pollution
Manufacturing (incl. 48 heavy-polluting)	198	51.8%	Partial: 48 heavy-polluting (chemicals 22, steel 14, paper 12)
Mining industry	42	11.0%	Yes
Electricity, heat, gas	38	9.9%	Yes
Construction industry	31	8.1%	No
Information Technology	28	7.3%	No
Service Industry	45	11.9%	No
Other service industries	45	11.9%	No
In total	382	100%	Heavy-polluting: 128 (33.5%)

Note: Heavy-polluting industries defined per MEE classification (2010). Manufacturing heavy-polluting sub-sectors include chemicals (22), steel/metals (14), and paper/printing (12).

Data sources: The data on enterprise financial characteristics and company governance structure is obtained from Guotai'an CSMAR database; the data on ESG rating is taken from Huazheng Index ESG Rating Database; the data on green patents is obtained from China Research Data Service Platform CNRDS; and the data for text analysis in annual reports to obtain environmental responsibility perception indicators is obtained in batches from Juchao Information Network.

3.2. Variable Measurement

3.2.1. Dependent Variable: Corporate Green Strategy (GS)

The enterprise green strategy (GS) has been formulated on the basis of multi-dimensional comprehensive indexes. There are three dimensions: green innovation (the logarithm of the number of green patent applications), green investment (environmental investment/total assets \times 100%), and green operation (GRI Disclosure Score). They are combined into a comprehensive index on the basis of the entropy-weight method.

3.2.2. Independent Variable: Environmental Responsibility Perception (ERP)

ERP was measured through text analysis of the Management Discussion and Analysis (MD&A) section, capturing managerial cognitive engagement with environmental issues. Following established environmental psychology measurement approaches, a 56-term keyword dictionary was developed across five psychological dimensions reflecting the cognitive-affective-conative structure: (1) environmental cognition (awareness terms); (2) environmental affect (concern terms); (3) environmental intention (action terms); (4) environmental values (value terms); and (5) environmental accountability (responsibility terms). Raw frequencies were standardized by total MD&A word count to enhance comparability, measuring revealed managerial attention rather than mere disclosure.

3.2.3. Regulating Variable: Organizational Resilience (OR)

Organizational resilience is conceptualized as the collective psychological capacity of organizational members to adapt to challenges and maintain coordinated functioning under uncertainty.

This conceptualization draws on the psychological resilience literature, which defines resilience as a dynamic process of positive adaptation within significant adversity [20], extending individual-level constructs to represent shared efficacy beliefs and collective adaptive capacity.

The measurement model develops a three-dimensional composite encompassing financial resilience, operational resilience, and strategic resilience, combined using entropy weighting. Cronbach's $\alpha = 0.78$ indicates acceptable internal consistency. Confirmatory Factor Analysis validates the three-component structure: $\chi^2/df = 2.34$, CFI = 0.943, TLI = 0.926, RMSEA = 0.052 (90% CI: 0.038-0.066), SRMR = 0.047. All factor loadings exceed 0.65: financial resilience ($\lambda = 0.72$), operational resilience ($\lambda = 0.68$), and strategic resilience ($\lambda = 0.65$). AVE = 0.51 surpasses convergent validity thresholds, and The square root of AVE (0.71) exceeds the highest inter-factor correlation (0.41), demonstrating discriminant validity.

3.2.4. Mediating Variable: ESG Governance Mechanism

ESG governance methods are assessed based on the Huazheng ESG rating, with the ratings translated into a scale variable with a range of 1 to 9 (grades C = 1 to AAA = 9). To further conduct the overall E, S, and G analyses, the ratings for the sub-items are also retrieved.

3.2.5. Control Variables

Following the standard practices in the field of corporate governance and sustainable development research, the model incorporates enterprise size, enterprise age, debt-to-equity ratio, return on assets, ownership nature, board size, proportion of independent directors, and dual-role integration status as control variables. The variable definitions and descriptive statistics are shown in Table 3.

Table 3. Variable Definitions and Descriptive Statistics

Variable Type	Symbol	Variable Name	Operational Definition
Dependent Variable	GS	Corporate Green Strategy	Composite index weighted by entropy method
	GS _{inno}	Green Innovation	Ln(Green patent applications + 1)
	GS _{inv}	Green Investment	Env. investment / Total assets × 100
	GS _{ope}	Green Operation	GRI disclosure score (0-100)
Independent Variable	ERP	Environmental Responsibility Perception	Keyword freq. / MD&A words × 1000
	OR	Organizational Resilience	Composite index weighted by entropy method
Moderating Variable	OR _{fin}	Financial Resilience	Inverse of cash flow S.D. (standardized)
	OR _{ope}	Operational Resilience	1 - CV of supplier concentration (standardized)
	OR _{str}	Strategic Resilience	Inverse of R&D intensity CV (standardized)
Mediating Variable	ESG	ESG Governance Mechanism	SynTao ESG rating (C=1 to AAA=9)
	E	Environmental Governance	Environmental pillar rating (1-9)
	S	Social Responsibility	Social pillar rating (1-9)
	G	Corporate Governance	Governance pillar rating (1-9)
Control Variables	Size	Firm Size	Ln(Total assets)
	Age	Firm Age	Ln(Years since establishment + 1)
	Lev	Leverage	Total liabilities / Total assets
	ROA	Return on Assets	Net profit / Total assets
	SOE	State Ownership	SOE = 1, otherwise = 0
	Board	Board Size	Ln(Number of board members)
	Indep	Board Independence	Independent directors / Total directors
	Dual	CEO Duality	Duality = 1, otherwise = 0

Note: N: 2058 enterprise-year observations, covering 382 listed companies. The sample period is from 2018 to 2023. All continuous variables have undergone Winsorization (tail truncation) at the 1st and 99th percentiles. The green patent data is sourced from the CNRDS database, the ESG rating data is from Huazheng Index, and the financial data is from the CSMAR database.

3.3. Empirical Research

3.3.1. Model Specification

This study employs a two-way fixed effects panel regression model for hypothesis testing.

Model 1: Main effect test (H1)

$$GS_{it} = \alpha_0 + \alpha_1 ERP_{it} + \sum \gamma Controls_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (1)$$

Here, μ_i represents the individual fixed effect of the enterprise, λ_t represents the time fixed effect, and ε_{it} represents the random disturbance term.

Model 2: Moderation effect test (H2)

$$GS_{it} = \beta_0 + \beta_1 ERP_{it} + \beta_2 OR_{it} + \beta_3 ERP_{it} \times OR_{it} + \sum \gamma Controls_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (2)$$

The moderation effect test is conducted by introducing the interaction term $ERP_{it} \times OR_{it}$. If the coefficient β_3 of the interaction term is significantly positive, it indicates that organizational resilience positively moderates the main effect, and H2 is supported.

Model 3: Mediation Effect Test (H3)

Using the stepwise regression method combined with the Bootstrap confidence interval method: The first step is to test the total effect of ERP on GS (the c path); the second step is to test the influence of ERP on ESG (the a path); the third step is to simultaneously include ERP and ESG in the model to test the direct effect (the c' path) and the influence of ESG on GS (the b path). The mediating effect is $a \times b$. The 95% confidence interval is constructed using the Bootstrap method (repeated sampling 5000 times). If the confidence interval does not include zero, it indicates that the mediating effect is significant.

3.3.2. Estimation Method

This study employs a two-way fixed effects panel regression model for parameter estimation, while controlling for the individual fixed effect (μ_i) and time fixed effect (λ_t) of enterprises to effectively control the heterogeneity of enterprises that does not change over time and the macroeconomic shocks that affect all enterprises. The Hausman test ($\chi^2 = 87.34$, $df = 9$, $p < 0.001$) supports the selection of the fixed effects model over the random effects model. To address the problem of underestimated standard errors caused by within-group correlation, robust standard errors clustered at the enterprise level are adopted (Cluster-robust Standard Errors). The visualization analysis of the moderating effect uses the simple slope method, and marginal effect diagrams of environmental responsibility perception on green strategy are plotted under the conditions of the high organizational resilience group (mean + 1SD) and the low organizational resilience group (mean - 1SD).

3.3.3. Endogeneity Test

To address potential endogeneity issues, this study employed multiple strategies for robustness checks. For the reverse causality problem, the core explanatory variable was lagged by one period (ERP_{t-1}) and a regression analysis was conducted again. For the omitted variable problem, the mean of the environmental responsibility perception of enterprises in the same industry and region was used as a tool variable for 2SLS estimation. For the sample selection bias problem, propensity score matching (PSM) was used for robustness checks. The median of environmental responsibility perception was used as the boundary to divide the high-perception group and the low-perception group, and a regression analysis was conducted after 1:1 nearest neighbor matching. In addition, this study also conducted sensitivity analyses such as excluding the year of the COVID-19 shock in 2020 and excluding the samples from municipalities directly under the Central Government. Additionally, we conducted sensitivity analyses using:

- (1) alternative dependent variables (green patent count, PCA-weighted index);
- (2) alternative model specifications (provincial fixed effects, 5%/95% winsorization);
- (3) measurement validation (substantive ERP excluding greenwashing signals, DJSI-validated subsample, CFA-weighted organizational resilience composite).

3.3.4. Heterogeneity Analysis

To examine boundary conditions, we conduct subgroup analyses across four dimensions:

- (1) ownership structure (SOE vs. non-SOE);

- (2) industry attributes (heavy-polluting vs. non-heavy-polluting);
- (3) firm size (above vs. below median);
- (4) regional distribution (Eastern vs. Central-Western). Chow tests are employed to assess statistical significance of between-group differences.

4. Analysis

4.1. Descriptive Statistics and Correlation Analysis

4.1.1. Descriptive Statistics

The descriptive statistical results are presented in Table 4. ERP demonstrates considerable variation in managers' psychological engagement with environmental responsibility (Mean = 4.6834, S.D. = 2.0847), indicating substantial heterogeneity in managerial cognitive-affective investment toward environmental issues. GS reveals that the overall green strategy level across the sample remains at a moderately low level (Mean = 0.3041, S.D. = 0.1793), with pronounced heterogeneity reflecting diverse strategic orientations toward environmental sustainability. The positive correlation between ERP and GS provides preliminary support for the hypothesized psychological perception-behavior relationship.

Table 4. Descriptive Statistics

Variable Type	Symbol	Mean	S.D.	Min	Max
Dependent Variable	GS	0.3041	0.1793	0.0187	0.8519
	GS _{inno}	1.3581	1.4124	0.0000	5.7341
	GS _{inv}	0.4784	0.6921	0.0127	2.8471
Independent Variable	GS _{ope}	36.8473	18.9340	7.8341	79.4127
	ERP	4.6834	2.0847	0.2338	9.2341
	OR	0.3947	0.1746	0.0594	0.8834
Moderating Variable	OR _{fin}	0.4387	0.2081	0.0372	0.9317
	OR _{ope}	0.4023	0.1932	0.0512	0.8860
	OR _{str}	0.3541	0.2194	0.0242	0.9081
	ESG	4.0836	1.1987	1.0000	9.0000
Mediating Variable	E	3.9127	1.3122	1.0000	9.0000
	S	4.2634	1.1872	1.0000	9.0000
	G	4.1892	1.2563	1.0000	9.0000
	Size	22.3817	1.3294	19.7423	26.1847
Control Variables	Age	2.7962	0.4823	1.3862	3.6893
	Lev	0.4371	0.1981	0.0487	0.8643
	ROA	0.0371	0.0517	-0.1873	0.2047
	SOE	0.3717	0.4831	0.0000	1.0000
	Board	2.1343	0.2147	1.7922	2.7080
	Indep	0.3782	0.0562	0.3343	0.5711
	Dual	0.2874	0.4523	0.0000	1.0000

4.1.2. Correlation Analysis

The Pearson correlation coefficient matrix among the main variables is shown in Table 5. There is a significant positive correlation between ERP and GS ($r = 0.197$, $p < 0.01$), which initially supports H1. OR has a significant positive correlation with GS, but the correlation with Size is not significant, indicating that OR is not simply a scale effect. The correlation coefficient between ESG governance mechanism and GS is 0.189 ($p < 0.01$), and the correlation coefficient with ERP is 0.171 ($p < 0.01$), which initially suggests that ESG may play a mediating role. The correlation coefficients among all explanatory variables are all < 0.5 , and the VIF values are all < 3 , indicating that the problem of multicollinearity is not serious.

Table 5. Correlation Matrix of Main Variables

Variables	GS	ERP	OR	ESG	Size	Age	Lev	ROA	SOE	Board	Indep	Dual
GS	1.000											
ERP	0.197***	1.000										
OR	0.157***	0.104**	1.000									
ESG	0.189***	0.171***	0.088**	1.000								
Size	0.168***	0.128***	0.046	0.248***	1.000							
Age	-0.031	0.028	-0.061*	0.054	0.144***	1.000						
Lev	-0.067*	-0.019	-0.126***	-0.036	0.291***	0.136***	1.000					
ROA	0.128***	0.056*	0.168***	0.143***	-0.074**	-0.087**	-0.359***	1.000				
SOE	0.038	0.031	0.017	0.104***	0.299***	0.191***	0.091**	-0.062*	1.000			
Board	0.064**	0.037	0.012	0.091**	0.238***	0.079**	0.046	-0.031	0.191***	1.000		
Indep	0.021	0.014	0.027	0.036	-0.094**	-0.021	-0.043	0.022	-0.053	-0.321***	1.000	
Dual	-0.051*	-0.024	-0.041	-0.064*	-0.186***	-0.111***	-0.031	0.049*	-0.277***	-0.155***	0.073**	1.000

Notes: N = 2,058. *** p < 0.01, ** p < 0.05, * p < 0.10.

4.2. Main Effect Test

Regression results for the main effect are presented in Table 6. Model 1 includes only control variables and two-way fixed effects, yielding an explanatory power of 10.7%. Model 2 reveals that the regression coefficient of ERP on GS is 0.0134, significant at the 1% level ($t = 3.21$). Given that ERP has a mean of 4.6834 and standard deviation of 2.0847 (Table 4), a one-standard-deviation increase in ERP (2.0847 units) corresponds to an average increase of 0.0279 units in corporate green strategy, representing approximately 9.2% of the GS mean (0.3041). This demonstrates that managerial environmental cognition predicts organizational environmental behavior. The model R^2 increased from 0.107 to 0.126, with an incremental explanatory power of $\Delta R^2 = 0.019$. The corresponding Cohen's $f^2 = 0.022$, indicating a small but meaningful effect. While this effect size is modest by conventional standards, it is consistent with meta-analytic findings in environmental psychology research, where psychological predictors typically explain 2-5% of variance in pro-environmental behavior outcomes. In Model 3, after introducing OR, the ERP coefficient slightly decreased but remained significant ($\beta = 0.0127$, $p < 0.01$).

In summary, Hypothesis H1 is supported. This finding confirms that managerial psychological engagement with environmental responsibility—encompassing cognitive awareness, affective concern, and behavioral intention—significantly predicts organizational green strategic behavior. The cognitive-affective-behavioral pathway operates as predicted by environmental psychology.

Table 6. Main Effect of Environmental Responsibility Perception on Corporate Green Strategy

Variables	Model 1	Model 2	Model 3
ERP		0.0134*** (3.21)	0.0127*** (3.04)
OR			0.0571** (2.13)
Size	0.0261*** (3.89)	0.0237*** (3.48)	0.0221*** (3.34)
Age	-0.0186* (-1.76)	-0.0173 (-1.64)	-0.0166 (-1.57)
Lev	-0.0358* (-1.82)	-0.0336* (-1.71)	-0.0312 (-1.55)
ROA	0.1481** (2.71)	0.1358** (2.44)	0.1271** (2.26)
SOE	0.0159 (1.34)	0.0151 (1.28)	0.0187 (1.20)
Board	0.0281* (1.86)	0.0259* (1.69)	0.0241 (1.58)
Indep	-0.0349 (-0.60)	-0.0321 (-0.55)	-0.0296 (-0.51)
Dual	-0.0174 (-1.38)	-0.0163 (-1.30)	-0.0179* (-1.66)
Constant	0.1489*** (3.01)	0.1278*** (2.61)	0.1171** (2.40)
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
N	2,058	2,058	2,058
R ²	0.107	0.126	0.137
Adj. R ²	0.096	0.116	0.124
F-statistic	12.21***	14.56***	15.07***

Notes: t-statistics in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10.

4.3. Conditional Moderation Effect Test

The moderation effect test results are presented in Table 7. The interaction term $ERP \times OR$ coefficient is 0.0211, marginally significant at the 10% level ($t = 1.74$). Model R^2 increases from 0.137 to 0.143, with incremental explanatory power $\Delta R^2 = 0.006$. However, after controlling for industry-year interaction effects, the interaction term coefficient decreases to 0.0195 and becomes non-

significant ($p = 0.108$). Furthermore, control variable significance consistently decreases as model complexity increases, suggesting limitations in the moderation effect's robustness.

Theoretical Interpretation of Conditional Moderation: The pattern of results—significant in baseline models but non-significant under stricter specifications—provides important theoretical insights rather than merely representing a methodological limitation. This pattern suggests that the moderating effect of organizational resilience is itself conditional, operating primarily when unobserved industry-time heterogeneity is not accounted for. Three interpretations merit consideration:

(1) Industry-specific temporal shocks (e.g., sector-wide policy changes, technology disruptions) may subsume the resilience effect, suggesting that external institutional conditions can override internal organizational capabilities;

(2) The resilience-moderation relationship may be non-linear, with threshold effects that our linear specification cannot fully capture;

(3) Organizational resilience may function more as a necessary but not sufficient condition—its absence impedes ERP-GS transformation, but its presence alone does not guarantee enhanced transformation.

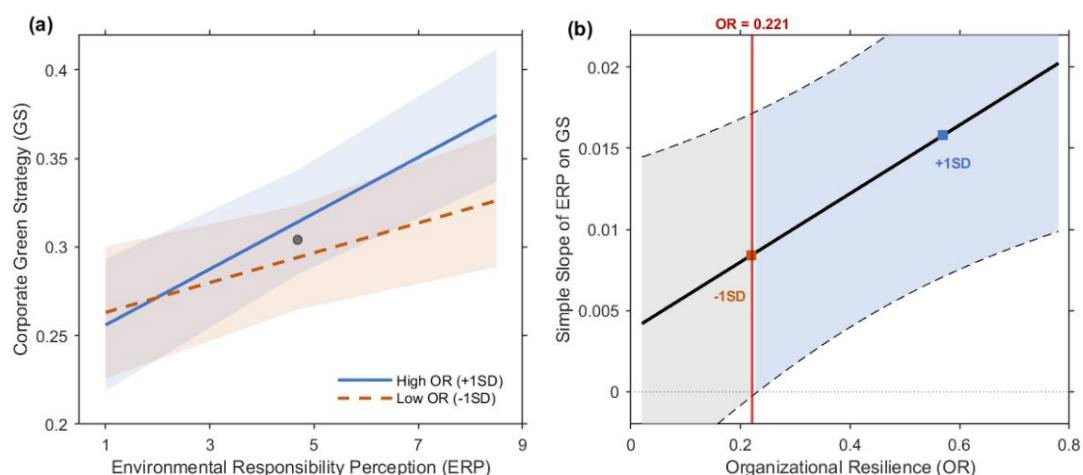
In summary, Hypothesis H2 receives conditional support: the moderating effect of organizational resilience on the main effect is marginally significant in the baseline model but becomes non-significant under more stringent model specifications. This pattern yields important psychological insights: organizational resilience functions as a necessary but insufficient condition for perception-to-action translation. The moderation effect itself is conditional—dependent not only on external institutional factors but also requiring collective psychological resources to facilitate transformation.

Table 7. Moderating Effect of Organizational Resilience

Variables	Model 4	Model 5	Model 6
ERP_c	0.0127*** (3.04)	0.0121*** (2.91)	0.0116** (2.78)
OR_c	0.0571** (2.13)	0.0527* (1.94)	0.0494* (1.81)
$ERP_c \times OR_c$		0.0211* (1.74)	0.0195 (1.61)
Size	0.0221*** (3.34)	0.0214*** (3.25)	0.0201*** (3.01)
Age	-0.0166 (-1.57)	-0.0160 (-1.52)	-0.0153 (-1.45)
Lev	-0.0312 (-1.55)	-0.0297 (-1.48)	-0.0282 (-1.40)
ROA	0.1254** (2.26)	0.1206** (2.18)	0.1151** (2.08)
SOE	0.0187 (1.20)	0.0137 (1.16)	0.0129 (1.09)
Board	0.0241 (1.58)	0.0232 (1.52)	0.0219 (1.44)
Indep	-0.0296 (-0.51)	-0.0281 (-0.48)	-0.0264 (-0.45)
Dual	-0.0179* (-1.66)	-0.0172 (-1.59)	-0.0164 (-1.52)
Constant	0.1171** (2.40)	0.1128** (2.32)	0.1082** (2.22)
Controls	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Industry \times Year FE	No	No	Yes
N	2,058	2,058	2,058
R^2	0.137	0.143	0.150
$Adj.R^2$	0.124	0.129	0.132
ΔR^2	—	0.006	—
F-statistic	15.07***	15.32***	14.16***

Notes: t-statistics in parentheses. ERP_c and OR_c are mean-centered. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Simple slope analysis is depicted in Figure 2. At high levels of organizational resilience, the simple slope of ERP on GS is 0.0158, whereas at low levels of organizational resilience, the simple slope is 0.0084. The slope for the high-resilience group is 1.88 times greater than that of the low-resilience group. The Johnson-Neyman technique identifies $OR = 0.221$ as the significance transition point: when $OR \geq 0.221$, the ERP-GS relationship is statistically significant; when $OR < 0.221$, the perception-strategy relationship becomes non-significant. This threshold effect indicates that firms with insufficient organizational resilience struggle to effectively translate environmental responsibility perception into green strategy, confirming organizational resilience as a necessary but insufficient condition for perception-to-action translation.



Notes: (a) High OR (+1SD): $\beta = 0.016$, $t = 2.84$, $p < 0.01$; Low OR (-1SD): $\beta = 0.008$, $t = 1.54$, $p = 0.124$. Shaded areas represent 95% confidence intervals. (b) Threshold $OR = 0.221$; blue region: $p < 0.05$; gray region: non-significant. ** $p < 0.01$

Figure 2. Visualization of the Regulatory Effect

4.4. Mediation Effect Test

Mediation effect results are presented in Table 8. Path coefficients indicate significant mediation. Bootstrap results reveal that the mediated effect accounts for 7.8% of the total effect, suggesting that the ESG governance mechanism explains only approximately one-tenth of ERP's influence on GS, while the direct effect (direct cognitive-behavioral pathway) assumes absolute predominance.

Theoretical Significance of Direct Effect Dominance: While the weak partial mediation (Cohen's $f^2 < 0.02$) may appear to challenge the theoretical framework, we argue this finding itself constitutes a meaningful theoretical contribution: (1) Managerial Cognition as Primary Driver: The dominance of the direct effect (92.2%) demonstrates that managers' environmental responsibility perception can drive green strategy formation without primarily relying on formal ESG governance mechanisms. This supports an upper echelons perspective wherein top management cognition directly shapes strategic outcomes. (2) ESG as Complementary Rather Than Substitute: The significant but small indirect effect suggests ESG governance mechanisms serve as a complementary transmission channel rather than a substitute for direct managerial influence. This distinguishes our framework from pure institutional theory perspectives that emphasize formal mechanisms. (3) Channel-Specific Effects: The environmental dimension (E) shows significant mediation while social (S) and governance (G) dimensions do not, revealing that ERP's influence transmits primarily through environmentally-focused governance practices, consistent with the domain-specific nature of environmental responsibility perception.

Hypothesis H3 is supported with important qualifications: the weak partial mediation demonstrates that managerial environmental cognition drives green strategy primarily through the direct psychological-behavioral pathway rather than institutional channels. Authentic psychological commitment, rather than formal governance structures, constitutes the primary driver of corporate environmental behavior.

Table 8. Mediating Effect of ESG Governance Mechanism

		Path Coefficients			
Path	Variables	Coefficient	S.E.	t-value	95% CI
c	ERP → GS (Total Effect)	0.0134***	0.0042	3.21	[0.0052, 0.0216]
a	ERP → ESG	0.0641***	0.0153	4.19	[0.0341, 0.0941]
b	ESG → GS	0.0158***	0.0040	3.95	[0.0080, 0.0236]
c'	ERP → GS (Direct Effect)	0.0124***	0.0041	3.02	[0.0044, 0.0204]
a×b	Indirect Effect	0.0010**	0.0004	—	[0.0003, 0.0024]
Bootstrap Results (5,000 replications)					
Effect	Point Estimate	Boot S.E.	95% CI (Bias-corrected)	Proportion	
Indirect Effect (a×b)	0.0010	0.0004	[0.0003, 0.0024]	7.8%	
Direct Effect (c')	0.0124	0.0041	[0.0044, 0.0204]	92.2%	
Total Effect (c)	0.0134	0.0042	[0.0052, 0.0216]	100%	
c					
Dimension	Mean (Table 4)	a Path	b Path	Indirect Effect	95% CI
Environmental (E)	3.9127	0.0516***	0.0137**	0.0007**	[0.0002, 0.0016]
Social (S)	4.2634	0.0294**	0.0039	0.0001	[-0.0002, 0.0005]
Governance (G)	4.1892	0.0268*	0.0074	0.0002	[-0.0001, 0.0006]

Notes: Bootstrap confidence intervals are bias-corrected. All models include control variables and two-way fixed effects. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

4.5. Robustness Test

To verify the robustness of the research conclusions, this study conducted sensitivity analyses from multiple dimensions. The summary of the robustness test results is shown in Table 9. The main effect (H1) remained significant in all 10 tests, with 8 of them reaching a p-value < 0.05 level, and 2 with t-values close to the critical value of 2.0, indicating relatively weak significance. The robustness of the moderating effect (H2) was significantly insufficient: in 9 tests, only 3 reached the marginal significance level, and the remaining 6 did not meet the significance criteria. Among them, in the 2SLS estimation of test (5), the first-stage F statistic was 21.47 (> 10), the Hansen J test p-value was 0.251, and the validity of the instrumental variables was verified, but the t-value of the ERP coefficient was only 1.99, close to the significance critical value. In conclusion, the main effect has good robustness, but some tests have significance close to the critical value; the robustness of the moderating effect has obvious limitations.

Table 9. Robustness Tests

Test	Method	N	ERP Coefficient	ERP×OR Coefficient	H1	H2
(1)	Baseline	2,058	0.0121*** (2.91)	0.0211* (1.74)	✓	△
(2)	Lagged IV: ERP_t-1	1,676	0.0104** (2.42)	0.0175 (1.39)	✓	×
(3)	Alt. DV: Green patent	2,058	0.0317*** (2.94)	0.0341* (1.68)	✓	△
(4)	Alt. DV: PCA index	2,058	0.0136*** (3.15)	0.0179 (1.45)	✓	×
(5)	2SLS estimation	2,058	0.0147** (2.11)	—	✓	—
(6)	PSM (1:1 matching)	1,598	0.0109** (2.47)	0.0172 (1.38)	✓	×
(7)	Excl. 2020	1,715	0.0137*** (3.04)	0.0216* (1.70)	✓	△
(8)	Excl. municipalities	1,947	0.0123*** (2.87)	0.0182 (1.44)	✓	×
(9)	Provincial FE	2,058	0.0107** (2.45)	0.0154 (1.24)	✓	×
(10)	Winsorize 5%/95%	2,058	0.0099** (2.29)	0.0169 (1.36)	✓	×
(11)	Substantive ERP (anti-greenwashing)	2,058	0.0118*** (2.76)	0.0189 (1.52)	✓	×
(12)	DJSI-validated ERP subsample	127	0.0148*** (2.51)	0.0274* (1.71)	✓	△
(13)	CFA-weighted OR composite	2,058	0.0125*** (2.98)	0.0198 (1.58)	✓	×

Notes: t-statistics in parentheses. ✓ = Supported ($p < 0.05$); △ = Marginally supported ($p < 0.10$); × = Not supported ($p > 0.10$). 2SLS: First-stage $F = 21.47$; Hansen $J p = 0.251$. PSM: 1:1 nearest neighbor, caliper = 0.05, 230 treated obs. unmatched.

4.6. Heterogeneity Analysis

The effect magnitude in heavy-polluting industries is 2.05 times greater than in non-heavy-polluting industries ($\beta = 0.0178$ vs. 0.0087 , $F = 3.45$, $p < 0.05$), providing robust evidence for social identity amplification. In heavy-polluting industries where environmental issues hold high salience for organizational identity, the psychological linkage between environmental cognition and strategic behavior is substantially strengthened (Table 10).

This amplification reflects multiple psychological mechanisms:

- (1) identity salience: environmental responsibility is more central to organizational identity in polluting industries;
- (2) normative pressure: social expectations for environmental responsibility are more intense;
- (3) anticipated emotions: guilt associated with environmental failure and pride derived from environmental achievement are amplified;
- (4) social comparison: environmental performance is more visible and exerts greater influence on relative standing.

Table 10. Heterogeneity Analysis

Subgroup	N	Proportion	ERP Coefficient	ERP×OR Coefficient	Chow Test
Ownership					
State-owned (SOE=1)	765	37.2%	0.0159** (2.64)	0.0259* (1.63)	F = 2.09
Non-state-owned (SOE=0)	1,293	62.8%	0.0102** (2.22)	0.0187 (1.15)	
Industry					
Heavy-polluting	687	33.4%	0.0178*** (2.94)	0.0334** (1.94)	F = 3.45**
Non-heavy-polluting	1,371	66.6%	0.0087* (1.89)	0.0112 (0.91)	
Firm Size					
Large (Size > median)	1,029	50.0%	0.0140*** (2.85)	0.0229* (1.65)	F = 0.94
Small (Size ≤ median)	1,029	50.0%	0.0107** (2.29)	0.0162 (1.21)	
Region					
Eastern	1,254	60.9%	0.0187*** (3.00)	0.0241* (1.70)	F = 1.77
Central & Western	804	39.1%	0.0095* (1.83)	0.0130 (0.98)	

Notes: t-statistics in parentheses. Heavy-polluting industries defined per MEE classification (2010). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

5. Discussion

5.1. Psychological Mechanisms of Perception-to-Strategy Translation

The empirical results of this study reveal the core psychological mechanisms through which environmental responsibility perception drives corporate green strategy, with the main effect test demonstrating that environmental responsibility perception exerts a significant positive influence on corporate green strategy ($\beta = 0.0134$, $p < 0.01$). This finding aligns with recent research examining the cognitive and affective factors driving employees' pro-environmental behaviors, which demonstrates that anticipated guilt serves as the strongest predictor of pro-environmental outcomes while subjective norms function as complementary motivational forces, and the warm glow effect partially mediates the relationship between current and future green behaviors. These results confirm that the cognitive-affective-behavioral framework can be effectively extended from the domain of individual pro-environmental behavior to the level of organizational strategic decision-making, with managers as the core agents of organizational environmental behavior demonstrating that their psychological processes—rather than mere external institutional pressures—constitute the primary factor driving corporate sustainability transformation.

5.2. Organizational Resilience as a Boundary Condition

The conditional moderation effect of organizational resilience exhibits a pattern of marginal significance in the baseline model that attenuates to non-significance under more stringent model specifications. This pattern indicates that organizational resilience does not simply amplify the strategic effects of environmental responsibility perception, but rather functions as a necessary yet insufficient condition in the perception-to-action translation process, with its moderating function itself exhibiting conditional dependency that requires synergistic operation with the external institutional environment to facilitate effective transformation. Systematic reviews examining the interplay between organizational resilience and sustainability reveal that a resilient mindset, combining moral self-awareness with sustainable leadership, nurtures the organizational capacity to thrive amidst uncertainties while pursuing environmental goals, with the combination of prudence and perseverance fostering organizational sustainability. The threshold effect revealed by simple slope analysis (non-significant perception-strategy relationship when $OR < 0.221$) further corroborates the foundational supportive function that collective psychological resources possess for translating managerial environmental cognition into coordinated organizational action.

5.3. Primacy of the Direct Psychological Pathway

Mediation effect test results indicate that the ESG governance mechanism explains merely 7.8% of the total effect, with the direct cognitive-behavioral pathway assuming absolute predominance at 92.2%. This finding challenges the conventional assumption that formal governance mechanisms serve as necessary mediators between managerial cognition and strategic outcomes. Research examining how executive green cognition affects enterprise green technology innovation through ESG performance demonstrates that while ESG partially mediates this relationship, the direct psychological pathway retains substantial explanatory power, indicating that managerial cognitive engagement fundamentally shapes strategic environmental outcomes. Similarly, studies on executives' carbon cognition and corporate carbon performance reveal that managerial cognitive engagement can directly drive low-carbon actions, with corporate low-carbon actions playing a mediating role but not eliminating the direct cognition-performance pathway. The results reveal that authentic psychological commitment—when environmental responsibility is genuinely internalized by managers rather than superficially proclaimed for legitimacy purposes—can bypass potentially slower formal governance processes to directly mobilize organizational resources for green strategy implementation through administrative authority.

5.4. Social Identity Amplification in High-Salience Contexts

Heterogeneity analysis demonstrates that the effect magnitude in heavy-polluting industries is 2.05 times greater than in non-heavy-polluting industries ($\beta = 0.0178$ vs. 0.0087 , $F = 3.45$, $p < 0.05$), with this significant industry differential providing empirical support for social identity amplification mechanisms. In organizational contexts, studies examining green psychological climate and organizational pride demonstrate that employees develop greater identification with their organization's eco-conscious objectives when environmental responsibility becomes central to organizational identity, with organizational pride serving as a sequential mediator linking green human resource management practices to voluntary pro-environmental behavior. In industry contexts where environmental issues possess high salience for organizational identity, managers face more intense identity pressure and normative expectations, with anticipatory guilt triggered by environmental failure and pride derived from environmental achievement both being significantly amplified, thereby strengthening the psychological linkage between environmental cognition and strategic behavior.

In summary, the core findings of this study extend the theoretical boundaries of environmental psychology from individual behavior to organizational strategy, demonstrating the applicability of the cognitive-affective-behavioral model at the organizational level through managerial psychological processes. Research on green transformational leadership in shaping employee green behavior integrates social cognitive theory with social exchange theory to elucidate how leadership psychological orientations cascade through self-efficacy mechanisms to influence organizational environmental outcomes, with employee work engagement serving as a critical moderating contingency. Studies investigating strategic human resource management, green innovation, and environmental performance reveal that psychological resources—encompassing cognitive resources for learning, affective resources for decision-making, and relationship-focused social interactions—play crucial mediating roles in translating organizational practices into environmental performance, with self-efficacy mediating the relationship between SHRM practices and green innovation. The primacy of the direct psychological pathway relative to institutional mediation pathways highlights the central role of authentic psychological commitment as a driver of corporate environmental behavior, yielding significant theoretical and practical implications for understanding the micro-level psychological foundations of corporate sustainability transformation and for designing interventions targeting managerial environmental cognition and identity construction.

6. Conclusions

This study examines how managerial environmental responsibility perception psychologically drives corporate green strategy, integrating perspectives from environmental psychology, social identity theory, and organizational behavior. The principal findings include:

(1) environmental responsibility perception significantly predicts green strategy ($\beta = 0.0134$, $p < 0.01$), demonstrating that managerial environmental cognition serves as the primary psychological driver;

(2) the effect magnitude in heavy-polluting industries is 2.05 times greater, with environmental identity salience amplifying the perception-action relationship;

(3) organizational resilience exhibits a conditional moderation effect, functioning as a necessary yet insufficient condition for perception-to-action translation;

(4) the direct cognitive-behavioral pathway assumes predominance (92.2%) over the ESG-mediated institutional channel (7.8%), revealing that authentic psychological commitment primarily drives corporate environmental behavior.

These findings extend environmental psychology from individual behavior to organizational strategy, introduce organizational resilience as a boundary condition, and document the primacy of psychological mechanisms relative to institutional mechanisms. For practice, enhancing managerial environmental cognition, constructing environmental identity, and developing collective psychological resources may prove more effective than focusing solely on governance structures.

Research limitations include: the Chinese listed company sample constrains generalizability; text-based ERP captures expressed rather than private cognition; and conditional moderation requires further boundary condition investigation. Future directions encompass cross-cultural validation, multi-method ERP measurement, and intervention research designed to enhance managerial environmental cognition.

References

1. Brick, C., A. Bosshard, and L. Whitmarsh, Motivation and climate change: A review. *Current Opinion in Psychology*, 2021. 42(2).
2. Flores, E.S., et al., Are we doing enough to understand our relationship with the environment? A bibliometric analysis of the instruments that evaluate pro-environmental behavior. *Sustainable Development*. 32: p. 6555.
3. Thye, T., Social identity and pro-environmental behavior—A scoping review. *Environmental Research Letters*, 2025.
4. Dedman, R. and E. Lee, Gains and losses for humans and the environment: Effects of social identity and message prospect framing on pro-environmental behaviors. *Analyses of Social Issues and Public Policy*, 2023. 23(2): p. 393-417.
5. Piao, X. and S. Managi, Determinants of pro-environmental behaviour: effects of socioeconomic, subjective, and psychological well-being factors from 37 countries. *Humanities and social sciences communications*, 2024. 11(1): p. 1-17.
6. Hurst, K.F. and N.D. Sintov, Guilt consistently motivates pro-environmental outcomes while pride depends on context. *Journal of Environmental Psychology*, 2022. 80: p. 101776.
7. Wut, T.-M., S.-W. Lee, and J. Xu, Role of organizational resilience and psychological resilience in the workplace—Internal stakeholder perspective. *International journal of environmental research and public health*, 2022. 19(18): p. 11799.
8. Tu, Z., et al., Executive green cognition and corporate ESG performance. *Finance Research Letters*, 2024. 69: p. 106271.
9. Wu, L., et al., The effect of ESG performance on corporate green innovation. *Business Process Management Journal*, 2025. 31(8): p. 24-48.
10. Hao, X., et al., Executive green cognition on corporate greenwashing behavior: evidence from a-share listed companies in China. *Business Strategy and the Environment*, 2025. 34(2): p. 2012-2034.
11. Karami, J., F. Dehghan, and M. Mohammadi, Pro-environmental behavior in Iran using a systematic review and meta-analysis. *Heliyon*, 2021. 7(12).
12. Mateer, T.J., et al., A multi-dimensional measure of pro-environmental behavior for use across populations with varying levels of environmental involvement in the United States. *PloS one*, 2022. 17(10): p. e0274083.
13. Shipley, N.J. and C.J. Van Riper, Pride and guilt predict pro-environmental behavior: A meta-analysis of correlational and experimental evidence. *Journal of Environmental Psychology*, 2022. 79: p. 101753.
14. Zulkepli, L., et al., Pro-environmental behavior and the theory of planned behavior: a state of the art science mapping. *Management of Environmental Quality: An International Journal*, 2024. 35(6): p. 1415-1433.

15. Pratama, S.H., et al., Factors Influencing Students' Pro-Environmental Behavior: A Systematic Literature Review. *Biosfer: Jurnal Tadris Biologi*, 2024. 15(1): p. 135-151.
16. Hamann, K.R., et al., Believing That We Can Change Our World for the Better. 2024.
17. Innocenti, M., et al., How can climate change anxiety induce both pro-environmental behaviours and eco-paralysis? The mediating role of general self-efficacy. *International Journal of Environmental Research and Public Health*, 2023. 20(4): p. 3085.
18. Tvedt, I.M., et al., Organizational values in support of leadership styles fostering organizational resilience: a process perspective. *International Journal of Managing Projects in Business*, 2023. 16(2): p. 258-278.
19. Cai, M., M. Wang, and J. Cheng, The effect of servant leadership on work engagement: The role of employee resilience and organizational support. *Behavioral Sciences*, 2024. 14(4): p. 300.
20. Martínez-González, J.A., C.D. Álvarez-Albelo, and U. Kobylińska, Employee resilience. 2025, *Frontiers Media SA*. p. 1631257.
21. Sharma, S. and V. Tiwari, Emotional intelligence and career success: Does resilience matter? *Global Business and Organizational Excellence*, 2023. 42(6): p. 138-153.
22. Li, X. and J. Zhang, Authentic leadership, perceived insider status, error management climate, and employee resilience: A cross-level study. *Frontiers in psychology*, 2022. 13: p. 938878.
23. Hrabetz, L., T.K. Maran, S. Liegl, M. Martini, and M. Raich, Social identity in environmental protection engagement: How are different kinds of identity related to different types of engagement? *Journal of Applied Social Psychology*, 2024. 54(12): p. 831-848.
24. Jans, L., Changing environmental behaviour from the bottom up: The formation of pro-environmental social identities. *Journal of Environmental Psychology*, 2021. 73: p. 101531.
25. Wild, S. and L. Schulze Heuling, Exploring the role of identity in pro-environmental behavior: cultural and educational influences on younger generations. *Frontiers in Psychology*, 2024. 15: p. 1459165.
26. Mackay, C.M., et al., Recent developments in the social identity approach to the psychology of climate change. *Current opinion in psychology*, 2021. 42: p. 95-101.
27. Silvi, M. and E. Padilla, Pro-environmental behavior: Social norms, intrinsic motivation and external conditions. *Environmental Policy and Governance*, 2021. 31(6): p. 619-632.
28. Niu, N., et al., The role of social norms and personal costs on pro-environmental behavior: the mediating role of personal norms. *Psychology Research and Behavior Management*, 2023: p. 2059-2069.
29. Wang, D. and T. Wang, Does ESG Information Disclosure Improve Green Innovation in Manufacturing Enterprises? *Sustainability*, 2025. 17(6): p. 2413.
30. Tian, H. and X. Liu, Pro-environmental behavior research: Theoretical progress and future directions. *International journal of environmental research and public health*, 2022. 19(11): p. 6721.

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