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Bridging the Great Divide: Investigating the Potent Synergy between Leadership, Zhong-Yong Philosophy, and Green Innovation in China

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Abstract: Zhong-yong thinking, a typical value orientation and mode of thought in traditional Chinese culture, has garnered significant scholarly attention. Various cross-sectional studies have explored the relationship between Zhong-yong thinking and innovation; yet, research specifically examining the impact of Zhong-yong thinking on green innovation is scarce. This study adopts the upper echelons theory and theory of manager cognition to investigate the influence of entrepreneurs' Zhong-yong thinking on green innovation while simultaneously considering institutional pressure and enterprise ownership types as boundary conditions. By analyzing 302 questionnaire responses, the empirical results demonstrate a direct positive effect of Zhong-yong thinking on green innovation. Moreover, institutional pressure positively moderates the relationship between Zhong-yong thinking and green innovation. State-owned enterprises exhibit a more significant impact of Zhong-yong thinking on green innovation than non-SOEs. Overall, this study contributes to the theoretical research of Zhong-yong in management disciplines, particularly in the green innovation literature. Its findings also hold implications for the practice of green innovation in enterprises.

Keywords: Zhong-yong thinking; green innovation; institutional pressure; enterprise ownership



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1. Introduction

The degradation of the environment poses a significant threat to humanity's future—as such, an increasing number of countries and organizations are turning to green innovation to achieve both environmental protection and economic growth. China, which has a history of crude economic development and is currently grappling with resource scarcity, environmental pollution, and overcapacity, recognizes that innovation is essential for achieving high-quality economic growth [1–5]. Given mounting environmental pressures, green innovation has emerged as a critical strategic tool for organizations and communities seeking environmental and economic success [6,7]. While green innovation is a subset of general innovation [8], it possesses unique characteristics that make it particularly effective in addressing environmental issues. Its contributions to solving environmental problems are significant, and it is increasingly employed by organizations seeking to differentiate themselves from their competitors and gain a competitive advantage [9–12].

From an academic perspective, most existing studies examining green innovation in firms have focused on external institutional constraints and environmental regulations, neglecting to explore the role of executives' implicit values and cognitive mindsets. Montalvo et al. suggest that regulations and customer demand are the main drivers of green innovation [13–15]. At the same time, Saunila et al. argue that economic and institutional pressures drive green innovation and contribute to social sustainability [16]. However, Kawai et al. find that stakeholder pressure has a negative impact on green innovation performance [6]. Recently, studies have shifted focus from external factors to internal ones, such as the influence of corporate executives on green innovation [17]. For instance, Yin proposes that executive academic experience contributes to corporate green innovation [18],

while other research suggests that female executives' stretch of power positively affects green innovation [19]. According to the upper echelons theory, key characteristics, values, and perceptions of corporate leaders influence corporate strategic decisions [20]. However, most studies on the relationship between executives and green innovation have focused on exogenous characteristics, such as the demographics of corporate leaders, rather than exploring the impact of traits such as values and perceptions of corporate executives on green innovation.

Zhong-yong thinking is a distinctive cognitive and value approach in the Chinese context, emphasizing the importance of dealing with issues holistically, without preconceptions, to achieve overall harmony and balance. Although Western theories such as dialectical thinking, rationality, and wisdom share similar concepts [21], the Middle Way represents a unique set of Chinese concepts encompassing various aspects of the self, interpersonal relationships, and dealing with matters. Recent literature has increasingly focused on the impact of Zhong-yong thinking on innovation [22–24]; however, exploring the effect of business leaders' Zhong-yong thinking on corporate green innovation remains limited. In traditional Chinese culture, Zhong-yong thinking emphasizes the harmonious coexistence of humans and nature, humans and the environment, and strives for balance and unity between human development and ecology, consistent with the essence of corporate green innovation.

At the heart of traditional Chinese cultural values lies the Zhong-yong value orientation. This approach has deeply ingrained itself in the Chinese organizational culture and psyche [25], influencing how people process and evaluate information, carry out tasks, and make decisions [26]. Indigenous psychological research has propelled the study of Zhong-yong thinking beyond the realm of philosophical concepts and into the realm of more quantifiable empirical studies [27]. Given the increasing importance of innovation in economic development, more and more companies have begun to investigate the influence of Zhong-yong on innovation [22,23]. While scholars have explored the impact of middle management on innovation behavior, research on the influence of Zhong-yong on green innovation is still limited. With the managerial cognitive theory positing that the cognitive style of business leaders plays a pivotal role in shaping entrepreneurial behavior and the firm's performance [28–30], studying the impact of leaders' Zhong-yong thinking on green innovation in organizations holds considerable theoretical and managerial significance.

Drawing on the upper echelons and managerial cognitive theories, this study investigates the impact of leaders' Zhong-yong thinking on green innovation, considering institutional pressure and corporate ownership. The research contributes to the existing literature in several ways. Firstly, it links the cognition of leaders within the company to corporate green innovation, enriching the research on the drivers of green innovation, which has focused mainly on environmental regulation, media coverage, and official turnover. Secondly, it expands the scope of research on the influence of traditional Chinese culture on green innovation by examining Zhong-yong thinking within the Chinese context, providing a theoretical basis for promoting Chinese traditional culture and the positive role of Confucian culture in the new era. Thirdly, the findings of this study have important practical implications. The study helps to understand the mechanism by which Zhong-yong thinking influences corporate green innovation and highlights the importance of Zhong-yong thinking in green development. The paper suggests that government departments should not only strengthen the construction of formal institutions such as environmental regulations but also pay attention to the social governance function of informal institutions (e.g., culture) by disseminating and promoting Confucian culture. This research has important theoretical and managerial significance and contributes to promoting national ecological civilization through disseminating and promoting Confucian culture.

2. Theory and Hypothesis

2.1. *Zhong-Yong Thinking: Entrepreneurial/Leadership Prospects*

Zhong-yong thinking is deeply rooted in Confucian philosophy and reflects the cognitive approach of the Chinese towards objects, people, and the environment [31]. Confucius regarded the middle ground as a noble virtue. The mean (balance) doctrine is regarded as one of China's most critical meta-cognitive factors, as it can moderate people's emotions and beliefs [32]. Wu and Lin have categorized Zhong-yong thinking into three dimensions: multiparty thinking, integrity, and harmony [33]. Multiparty thinking refers to the ability of individuals influenced by Zhong-yong thinking to identify and understand multiple viewpoints from various perspectives when confronted with multiple opinions or even conflicting information [34]. Integrity means that individuals can respond to their surroundings, maintain internal and external balance, and integrate external conditions (such as resource constraints and opposing views of others) and internal needs to reach a consensus [35]. Harmony refers to the ability of individual behaviors and attitudes to avoid extremes and be impartial, thus achieving harmony in interpersonal relations and the overall organization [36].

Congruently with the above, Zhong-yong thinking asserts the idea of keeping pace with time, advocating unity with the change of environment and time. Such cultural attributes and mindsets are ingrained deeply among all tiers of Chinese entrepreneurs and steer the cognitive strategy to effectively cope with the changes and uncertainties of today's environment [36]. As a thinking characteristic formed under Confucian culture, the doctrine of the mean or balance affects the attitude and behavior of Chinese entrepreneurs and leaders in integrating resources and facing entrepreneurial risks. Chou et al. pointed out that Zhong-yong thinking can be an effective cognitive strategy for coping with work stress [35]. Entrepreneurs, driven by utilizing the holism of the mean, integrate various resources (e.g., objects, people, and environment) [33]. Experts believe that leaders with Zhong-yong will choose the most appropriate way after considering various factors conducive to achieving innovation goals [37].

2.2. *Green Innovation*

In the present era, corporate green innovation has become a crucial concern for both the government and the academic community, given the global focus on sustainable development and the achievement of carbon neutrality. In recent years, many Chinese organizations have focused on achieving carbon neutrality and limiting carbon peaking to embrace green innovation as an essential tool for achieving their goals. As a novel mode of innovation, green innovation involves introducing new ideas, products, processes, and behaviors that contribute to reducing environmental burdens and achieving sustainability goals [38]. This innovative approach balances economic growth with environmental protection and is expected to serve as a new engine for development. Despite nascent awareness, many companies emphasize green innovation to achieve a competitive advantage in the global markets. This paradigm shift towards sustainability is helping companies reduce their environmental impact and enhance their reputation among stakeholders, including customers, employees, investors, and regulators. Researchers and practitioners have paid significant attention to green innovation for a more sustainable competitive advantage [39]. For instance, Le (2022) has emphasized the critical role of green innovation in achieving corporate sustainability [40].

2.3. *Zhong-Yong Thinking and Green Innovation*

Emerging from the traditional Chinese Confucian culture, the cognitive style of Zhong-yong thinking significantly impacts organizations, teams, and individuals [40–42]. Through the penetration of ideas and consciousness, Zhong-yong thinking affects the decision-making behavior of enterprise leaders. The concept of “harmony” in the doctrine of the mean highlights that human beings and nature are a harmonious whole. Human beings should follow the laws of nature and seek to live in harmony with nature instead of blindly

exploiting it [42]. This argument emphasizes the need for greater attention to environmental protection. Leaders who adopt Zhong-yong thinking should take self-cultivation, family harmony, state governance, and world peace as their duty and be guided by moral consciousness and family feelings to carry out green innovation actively. Moreover, research has shown that management attention and recognition play an ultimate role in green innovation decision-making [43]. Furthermore, senior managers, the most influential members of enterprises, have been considered the most crucial implementation factor of green innovation in organizations and companies [17]. Entrepreneurs who are more committed to environmental protection are more likely to innovate in implementing green innovations [44]. Incorporating the idea of harmony between nature and humans and striving for harmonious coexistence with nature, leaders influenced by Zhong-yong thinking attach greater importance to the harmony between humans and nature. They are more likely to respond positively to environmental protection policies, aware of the increasingly tense relationship between humans and nature and the need to pursue harmonious coexistence. As a result, they integrate more protection intentions in their behavioral decisions and make more commitments to environmental protection.

Green innovation involves adopting sustainable development-oriented technologies, products, services, organizational structures, or management modes by businesses [45]. Similar to regular innovation [8], implementing green innovation plans requires collaboration with external organizations and integrating external knowledge with internal organizations. Entrepreneurs' Zhong-yong thinking, which emphasizes internal and external harmony, is beneficial for enhancing cooperation with external organizations and acquiring external knowledge. It enables businesses to integrate internal and external resources, information, and understanding and to foster the learning and infiltration of external knowledge within the organization. This strategy could help transform external knowledge into internal skills, promotes the successful implementation of green innovation, and enhances enterprise performance. Businesses need to embrace green methods [46,47] and create a (green) corporate culture through the exchange of knowledge, experience, and skills among employees [48–50] to achieve innovation. Green organization identification motivates leaders to better interpret the organization's environmental protection concept, encourage internal communication, motivate employees to carry out green innovation behavior, and promote the acceptance of green methods within the organization [51]. Entrepreneurs with Zhong-yong thinking are receptive to diverse opinions and prioritize internal organizational harmony, enabling them to better understand the organization's environmental protection concept, encourage communication, motivate employees, and promote the acceptance of green methods within the organization.

In essence, the doctrine of the mean contains ecological wisdom that promotes the unity of nature and humans and a sense of mission, which can help foster the green development consciousness of enterprise managers. This philosophy encourages them to maintain enterprise reputation and prestige, overcome obstacles, and produce high-quality green products, thus strengthening the influence of corporate environmental responsibility on technological innovation activities. However, the pressure on stakeholders may negatively affect green product innovation and even green process innovation performance. This factor is considered one of the most significant barriers to green innovation in organizations and companies. Based on the above discussion, it is rationally assumed that leaders with Zhong-yong thinking are more likely to prioritize harmony, making it easier for them to handle stakeholder interest distribution and reduce obstacles arising from stakeholder pressure to green innovation. Therefore, the following hypothesis is proposed:

Hypothesis 1 (H1). *Zhong-yong thinking is positively related to green innovation.*

2.4. Institutional Pressure as a Moderating Mechanism

Legitimacy, as defined by institutional theory, is a crucial concept that reflects an enterprise's adherence to socially constructed norms, values, beliefs, and definitions [52]. Merely

meeting legal requirements or market demands is insufficient for enterprises; they must also align with social norms and values [53]. Green innovation, in particular, arises not only from market constraints, such as customer needs or product life cycles, but also from social and environmental pressures and opportunities [54]. External environmental pressures, including political and market pressure, and internal environmental driving forces, such as innovation resources and abilities, may motivate organizations and companies to adopt green innovation strategies and transform senior management's environmental awareness [55]. External pressures often spur environmental initiatives and may elicit different organizational responses [56]. Under stringent environmental regulations, organizations' competition modes and development strategies shift. Top managers can adopt knowledge management practices that align with their performance strategies [43], develop resources and capabilities [12], cultivate a green corporate culture among employees and managers [46], establish green innovation systems, and enhance green innovation performance [17]. Driven by environmental policies and corporate responsibility requirements, a leader with Zhong-yong thinking would seek to minimize environmental harm while producing products, processes, and technologies. This approach could allow enterprises to gain organizational legitimacy, more resources, more living space, and the adoption of new innovative practices, such as green production methods, products, and processes. Institutional pressure consists of coercive pressure and normative pressure [57]. We speculate that coercive and normative pressure are the boundary conditions for the relationship between Zhong-yong thinking and green innovation. Therefore, the following is proposed:

Hypothesis 2 (H2). *Institutional pressure positively moderates the relationship between Zhong-yong thinking and green innovation, which means that coercive pressure and normative pressure positively moderate the relationship between Zhong-yong thinking and green innovation separately.*

2.5. The Moderating Role of the Nature of Ownership

In emerging markets such as China, the coexistence of state-owned enterprises (SOEs) and non-SOEs is a notable institutional feature. Since ownership type plays a crucial role in promoting green innovation in enterprises, there is a high probability that Zhong-yong thinking can effectively facilitate the adoption of green management practices in SOEs [56]. It influences the effectiveness of environmental orientation (EO) in promoting green management [57]. While previous studies have found that the relationship between female directors and environmental innovation is stronger for SOEs than for non-SOEs [58], the ownership type can potentially affect the implementation of green innovations among enterprises [57]. Thus, it is reasonable to consider the nature of ownership as a factor when exploring the impact of Zhong-yong thinking on green innovation. For instance, SOEs may prefer green innovation more than non-SOEs due to differences in strategic goals and business philosophy [59]. SOEs have deeper political tasks and social stability missions; so, they are more inclined to pursue economic, social, and economic goals simultaneously. In contrast, non-SOEs often prioritize the survival and development of their enterprises. Even though SOEs' economic efficiency is lower than that of non-SOEs, studies have reported higher social responsibility performance among SOEs [60]. Therefore, despite balanced economic and social benefits, SOE leaders may feel more pressure to shoulder certain environmental responsibilities instead of solely pursuing economic efficiency. They are expected to pay more attention to harmonious coexistence between man and nature when implementing related policies. In private enterprises driven by economic interests, the impact of Zhong-yong thinking on green innovation decision-making may be limited.

Furthermore, the ownership of an enterprise plays a crucial role in shaping the decision-making process and coordination abilities of its managers. State-owned enterprises (SOEs) are distinct from non-SOEs in that they are subject to a high level of government control and enjoy various political privileges [61]. This external pressure can hamper decision-making and make it difficult for managers to operate independently. To effectively manage an SOE, managers need to adopt a multi-examination thinking approach that inte-

grates and coordinates the interests and demands of multiple stakeholders, as encouraged by Zhong-yong thinking [61]. In contrast, non-SOEs have relatively simple and flexible personnel adjustment policies that do not require high coordination skills from managers. They are also more directly influenced by market discipline, with the decision to close a company or replace a manager primarily determined by market forces rather than political pressures [62,63]. Despite the benefits of implementing green innovation, SOEs may face significant resistance when attempting to do so [64,65]. This resistance may manifest in the form of internal staff turnover or restructuring, as well as structural pressures associated with organizing the implementation of green innovation. Consequently, SOE leaders must possess strong coordination skills to deal effectively with resistance and conflicts within their organizations. Zhong-yong thinking can play a significant role in developing these skills and addressing these challenges.

Based on these differences, it is predicted that Zhong-yong thinking will significantly impact the coordination abilities and decision-making processes of leaders in SOEs more than those in non-SOEs. Such behavior is due to the unique external pressures and internal challenges SOEs face in implementing green innovation. Therefore, we propose the following hypothesis:

Hypothesis 3 (H3). *The positive moderating effect of Zhong-yong thinking on green innovation is more profound among SOEs than non-SOEs.*

Based on the above analysis, we provide an integrated framework for this study, as shown in Figure 1.

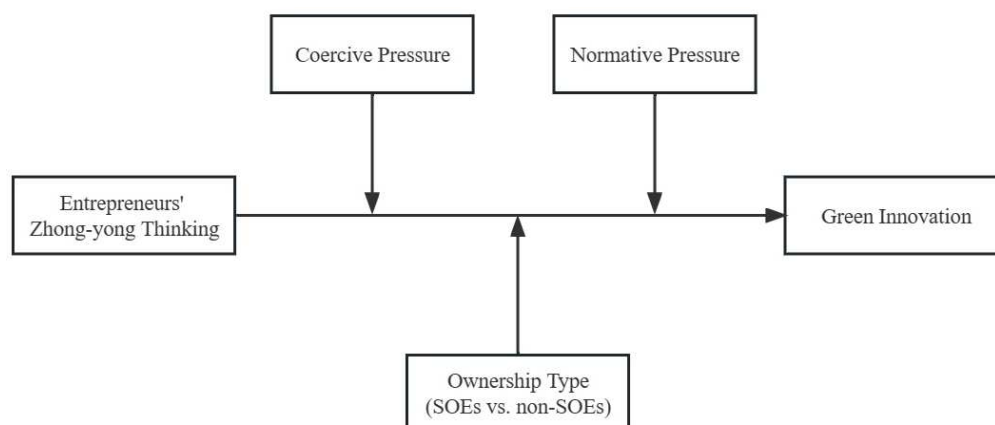


Figure 1. The proposed theoretical model.

3. Research Methodology

3.1. Data Collection and Sample

The collection of data for this study involved the utilization of a survey questionnaire. However, before proceeding with the questionnaire's large-scale distribution, a pre-survey was conducted with six well-known organizations to obtain feedback on the appropriateness of the questionnaire. The survey instrument was subsequently adjusted based on said feedback. The sample included companies from different provinces in China. The top leaders of Chinese enterprises involved in green innovation activities were the prime targets of this study. This questionnaire was then distributed and administered between October 2021 and October 2022. Before the top leaders were given the opportunity to answer the questionnaire, they were asked if their enterprises had conducted any green innovation activities within the past three years. This was mainly aimed to ensure that only eligible enterprises participated in this study. Additionally, the questionnaire contained an inquiry to verify that the surveyed enterprises were consistent with the research context of this paper. For more details about the sample, see Appendix A, which provides information on regional sample distribution. The results demonstrated in Appendix B (hierarchical

regression analysis (location control variable added) and Appendix C (sub-sample hierarchical regression analysis (location control variable added)), consistent with Tables 5 and 6, reflect that regional differences had no effect on the results and model.

A total of 1000 questionnaires were disseminated, with a response rate of 415 being recorded, thus yielding a recovery rate of approximately 41.5%. After the identification and removal of questionnaires with more than 5 unanswered questions, those completed by non-company executives, as well as those from companies that had not engaged in green innovation activities, and then randomly selecting one questionnaire from multiple questionnaires received from the same organization, a total of 302 valid questionnaires were obtained. The effective rate of this effort was calculated to be about 72.77%. The specific distribution of the valid samples has been presented in Table 1.

Table 1. Basic information of valid sample (N = 302).

Items	Category	Quantity	Weight	Items	Category	Quantity	Weight
Industry Properties	High-tech industries	189	62.5%	Gender	Male	154	50.9%
	Low-tech industries	113	37.4%		Female	148	49%
	3 years and below	7	2.3%		Fujian	77	25.5%
	3–6 years	30	9.9%	Location	Guangdong	67	22.2%
Firm Age	6–10 years	51	16.8%		Zhejiang	18	6.0%
	10 years and above	214	70.8%		Other Provinces	140	46.4%
	Large enterprises	64	21.1%		High School and below	11	3.6%
Firm Size	Medium-sized enterprises	126	41.7%	Education background	Diploma	35	11.5%
	Small enterprises	88	29.1%		Bachelor	188	62.2%
	Micro-enterprises	24	7.9%		Master and above	68	22.5%

3.2. Measurement of Variables

The present study employed well-established measurement scales previously tested in empirical studies published domestically and internationally in authoritative journals. These scales were then modified and refined to suit the specific research context of this paper. Before the formal administration of the questionnaire, a small-scale pre-test was conducted to fine-tune the entries and wording. The 5-point Likert scale was used for questionnaire measurement.

Zhong-yong thinking (ZY). The Zhong-yong thinking scale used in our study was developed by Wu and Lin (2005) [33], which includes a 13-item scale comprising three dimensions of multiple thinking, integration, and harmoniousness. The scale has been widely cited in later literature, such as Lang et al. (2022), Chen et al. (2021), and Zhou and Yang (2020) [22,37,66]. The alpha reliability value of the scale was 0.895 in our study.

Green innovation (GI). Green innovation was measured on a 4-item scale developed by Wang (2020) [67], which was fine-tuned to account for the new context of “China’s double carbon goal”. This scale stem was green innovation of environmental product development, process, technology, and management within the organization. Cronbach’s alpha for the scale was 0.774.

Coercive pressure (CP). This latent variable was measured on a 4-item scale by Liu et al. (2010) [57]. The items are “If an enterprise violates environmental laws, the consequences may include governmental notification and criticism” and “If an enterprise does not meet legal pollution standards, it will face the threat of legal action”. Cronbach’s alpha for the construct was 0.864.

Normative pressure (NP). This construct was examined using a 3-item scale developed by Liu et al. (2010) [57]. A sample item is “Customers in our industry expect enterprises in our industry to be environmentally responsible”. Cronbach’s alpha for the construct was 0.843.

Lastly, the following terms were used as control variables based on an earlier study [68]: firm size = staff (representing the number of employees in the company; year = the time since business registration; ownership = differences in ownership of companies; industry = the sector to which the business associated. Cronbach’s alpha of the normative pressure on this scale was 0.843.

4. Results

4.1. Validation Factor Analysis

Utilizing the AMOS 26.0 software, a factor analysis was conducted to assess the discriminant and convergent validity of the variables. The results presented in Table 2 exhibit that the four-factor model ($\chi^2/\text{df} = 1.674^{**}$, RMSEA = 0.047, CFI = 0.951, TLI = 0.945, SRMR = 0.050) had a better fit, thereby indicating that the core variables had good discriminant validity. Moreover, the convergent validity of each variable was estimated through the average variance extracted (AVE) and the square root of AVE, while the composite reliability (CR) scores were used to check the correlation coefficient between each core variable for comparison. As shown in Table 3, the square roots of AVE values associated with the leader's Zhong-yong thinking (ZY), coercive pressure (CP), normative pressure (NP), and green innovation (GI) are greater than the correlation coefficient of each variable. The CR values of each variable exceed the critical value of 0.7. From the above findings, it was inferred that the variables possessed excellent convergent and discriminant validity and good composite reliability.

Table 2. Results of confirmatory factor analysis.

Models	χ^2	df	χ^2/df	RMSEA	CFI	TLI	SRMR
Four-factor model (ZY, CP, NP, GI)	406.664	243	1.674 **	0.047	0.951	0.945	0.050
Three-factor model (ZY, CP + NP, GI)	499.054	246	2.029 **	0.058	0.924	0.915	0.055
Two-factor model (ZY + CP, NP + GI)	763.574	248	3.079 **	0.083	0.846	0.829	0.088
Single-factor model (ZY + CP + NP + GI)	873.068	249	3.506 **	0.091	0.814	0.794	0.097

Note: ZY denotes the leader's Zhong-yong thinking, CP denotes coercive pressure, NP denotes normative pressure, and GI denotes green innovation; "+" denotes combining two factors into one. ** indicates $p < 0.001$.

Table 3. Factor loadings for each variable.

Variables	Items	Factor Loadings	CR	AVE
Zhong-yong thinking $\alpha = 0.895$	When discussing, I will consider the conflicting opinions at the same time	0.942	0.943	0.848
	I often think about the same thing from different perspectives	0.909		
	I will listen to all the opinions before I express them	0.941		
	When I make a decision, I will consider various possible conditions	0.897		
	I often try to find acceptable opinions in a situation of disagreement	0.960		
	I often try to find a balance between my own opinions and those of others	0.889		
	I will adjust my original ideas after considering the opinions of others	0.879		
	I expect to reach a consensus during the discussion	0.951		
	I try to incorporate my own opinions into the thoughts of others	0.895		
	I usually express conflicting opinions in a tactful way	0.879		
	I will try to reconcile the minority to accept the majority in a harmonious way	0.901		
	I usually consider the harmony of the organizational climate before making a decision	0.954		
	I usually adjust my behavior for overall harmony	0.965		

Table 3. Cont.

Variables	Items	Factor Loadings	CR	AVE
Coercive pressure $\alpha = 0.897$	Businesses face the threat of legal action if they do not meet legal pollution standards	0.800	0.865	0.617
	Businesses realize that environmentally irresponsible behavior can trigger fines and penalties	0.742		
	Consequences for companies that violate environmental laws may include a notification from government departments	0.803		
	If it fails to comply with national environmental laws and regulations, the company would face serious consequences	0.795		
Normative pressure $\alpha = 0.843$	Industry market trade associations/professional associations encourage environmental behavior in business	0.768	0.847	0.648
	Customers expect companies in our industry to be environmentally responsible	0.824		
	Environmental responsibility is a fundamental requirement for companies to enter the market in this sector	0.823		
Green Innovation $\alpha = 0.774$	Our company uses materials with little or no contamination/toxicity	0.694	0.793	0.505
	Our company improves and designs environmentally friendly packaging for existing and new products	0.701		
	Our company uses cleaner technologies to save pollution	0.742		
	Our company recovers and recycles our end-of-life products	0.705		

4.2. Common Method Deviation Test

This investigation adopted several measures during data collection to mitigate the effects of common method bias. These included employing the primary questionnaire layout and respondent information concealment methods, randomizing the questionnaires, and incorporating lie detector entries. Additionally, the respondents were informed that the questionnaires should be filled out anonymously with no right or wrong answers to encourage truthful responses. Subsequently, unrotated exploratory factor analysis was conducted on the core variables, as per Harman's one-way test recommended by [69]. The findings revealed that the first of the four factors extracted with eigenvalues greater than one explained 37.818% of the total variance (less than 40%). This result indicated that no single factor accounted for a significant portion of the variance and that the data exhibited no substantial common method bias.

4.3. Descriptive Statistics and Correlation Analysis

Table 4 provides a comprehensive overview of the means, standard deviations, and correlation coefficients of the variables used in this study. The term Staff in the results section refers to the number of employees in the company, consistent with earlier works [70,71]. Notably, the Pearson coefficients between the variables are below 0.7, which suggests that there are no issues of co-linearity, thus permitting the execution of further regression analysis. Of particular interest is the significant positive correlation between Zhong-yong thinking and green innovation ($r = 0.512$, $p < 0.01$), which supports our hypothesis.

Table 4. Mean and standard deviation of each variable and correlation between variables.

Variable	M	SD	1	2	3	4	5	6	7	8
1. ZY	4.021	0.545	0.921							
2. NP	3.893	0.670	0.428 **	0.805						
3. CP	4.108	0.592	0.556 **	0.691 **	0.785					
4. GI	3.637	0.681	0.512 **	0.548 **	0.530 **	0.710				
5. Staff	3.394	1.499	0.206 **	0.306 **	0.337 **	0.149 **	1			
6. Year	3.563	0.765	0.117 *	0.0900	0.0550	0.00400	0.440 **	1		
7. Ownership	1.940	0.902	−0.165 **	−0.267 **	−0.266 **	−0.175 **	−0.309 **	−0.134 *	1	
8. Industry	5.742	4.016	−0.222 **	−0.126 *	−0.0910	−0.197 **	0	−0.069	0.002	1

Note: * indicates $p < 0.05$, ** indicates $p < 0.01$; diagonals are AVE square root values. ZY denotes the leader's Zhong-yong thinking, CP denotes coercive pressure, NP denotes normative pressure, and GI denotes green innovation.

4.4. Hypothesis Testing

This study utilized step-wise hierarchical regression analysis conducted via STATA 17.0 software to evaluate the hypotheses, as seen in Table 5. After controlling for enterprise size, age, industry affiliation, and ownership, the analysis revealed a significant positive effect of the leader's Zhong-yong thinking on green innovation ($\beta = 0.603$, $p < 0.01$) in Model 1 and Model 2, confirming Hypothesis 1. The leader's Zhong-yong mindset, characterized by a discerning and adaptive approach, allows for compliance with national policies and a positive response to the “double carbon goal”. Furthermore, such leaders' inclusive and harmonious value orientation may inspire their subordinates to engage in green innovation and facilitate developing or introducing environmentally friendly solutions for their companies.

Table 5. Results of hierarchical regression analysis.

Variable	(1)	(2)	(3)	(4)
ZY		0.603 **	−0.162	−0.018
		(0.084)	(0.184)	(0.290)
CP			−0.163	
			(0.185)	
CP × ZY			0.145 **	
			(0.047)	
NP				−0.097
				(0.278)
NP × ZY				0.124 +
				(0.072)
Staff	0.066 *	0.247 *	0.117	0.121
	(0.026)	(0.115)	(0.118)	(0.110)
Year	−0.083 +	−0.439	−0.360	−0.381 +
	(0.046)	(0.272)	(0.271)	(0.226)
Industry	−0.035 **	−0.058	−0.035	−0.015
	(0.010)	(0.205)	(0.209)	(0.190)
Ownership	−0.107 **	−0.011	−0.016	0.040
	(0.043)	(0.090)	(0.087)	(0.081)
Constant	4.113 **	1.637 **	3.002 **	2.521 *
	(0.199)	(0.491)	(0.786)	(1.143)
Observations	302	302	302	302
R-squared	0.086	0.357	0.424	0.463

Note: + indicates $p < 0.1$, * indicates $p < 0.05$, ** indicates $p < 0.01$ (same below), and × indicates multiplication. ZY denotes the leader's Zhong-yong thinking, CP denotes coercive pressure, NP denotes normative pressure, and GI denotes green innovation.

Hypothesis 2 examined the moderating role of institutional pressure in the relationship between a leader's Zhong-yong thinking and green innovation. The results presented in Model 3 of Table 4 indicate that the interaction term between the leader's Zhong-yong thinking and coercive pressure is positively significant ($\beta = 0.145$, $p < 0.01$), partially

supporting Hypothesis 2. Simple moderating effect plotting in Figure 2 reveals that as coercive pressure increases, the positive relationship between the leader's Zhong-yong thinking and green innovation also strengthens. In Table 4, the test for the moderating effect of the leader's middle-of-the-road thinking and regulatory pressure (Model 4) affirmed acceptance of Hypothesis 2, as the interaction term displayed positive and significant results ($\beta = 0.124$, $p < 0.1$). The simple moderating effect plotted in Figure 3 indicates that the greater the intensity of normative pressure, the stronger the positive influence of the leader's Zhong-yong thinking on green innovation. Thus, the results suggest that Zhong-yong thinking among leaders can promote greater engagement in green innovation under multiple institutional pressures.

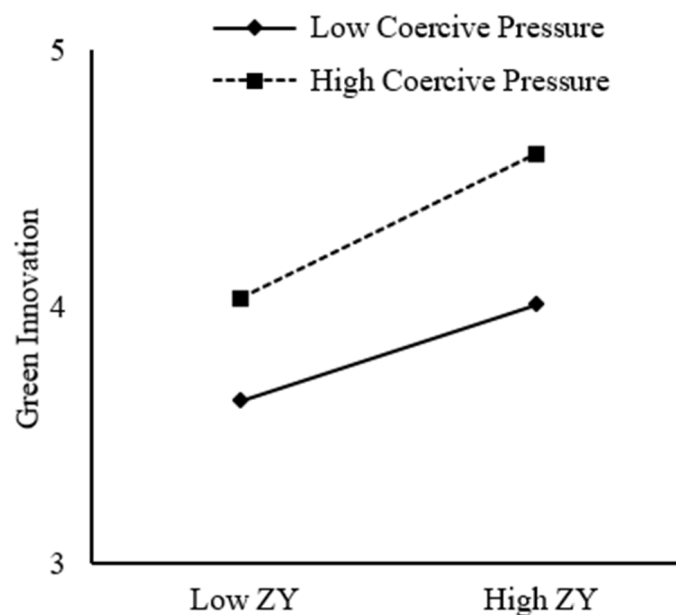


Figure 2. Diagram of the moderating effect of coercive pressure.

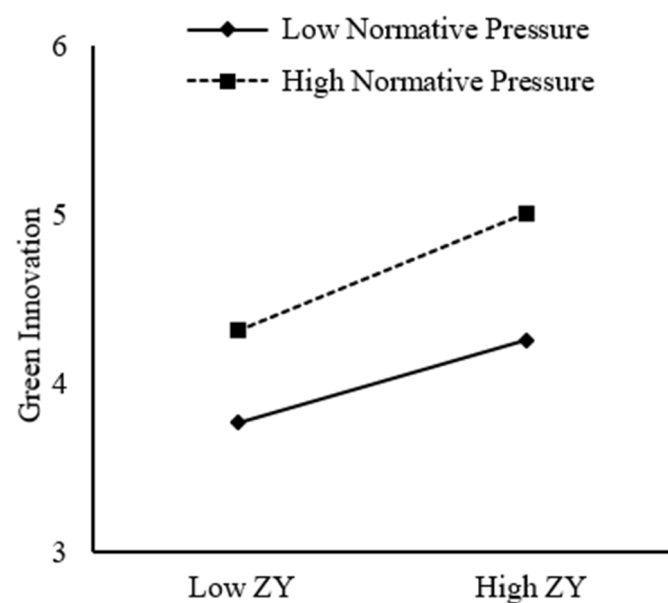


Figure 3. Diagram of the moderating effect of normative pressure.

In China, state-owned enterprises (SOEs) have existed as a distinct political and economic system [72]. Unlike private firms prioritizing economic interests, these organizations must take on greater social responsibilities and political tasks while pursuing financial

goals. This study compared state-owned and private samples to distinguish the different roles of leaders' Zhong-yong thinking in SOEs and private firms. In Table 6, Models 5 and 6 indicate that leaders' Zhong-yong thinking significantly impacted green innovation in a sample of 83 SOEs, even after controlling for company size, age, and industry affiliations ($\beta = 1.037$, $p < 0.01$). Similarly, in a sample of 190 private firms, as shown in Models 7 and 8, leaders' Zhong-yong thinking also significantly positively affected green innovation ($\beta = 0.561$, $p < 0.01$). However, a comparison of Models 6 and 8 revealed that the overall explanatory power of leaders' Zhong-yong thinking in the SOE sample (R-squared of 0.403) was significantly greater than that of the private sample (R-squared of 0.361). In support of Hypothesis 3, this result confirmed that the effect of Zhong-yong thinking on green innovation in SOEs was more profound and sensitive to government and social pressure than in non-SOEs.

Table 6. Results of sub-sample hierarchical regression analysis.

Variables	SOEs (N = 93)		Non-SOEs (N = 209)	
	(5)	(6)	(7)	(8)
ZY		1.037 ** (0.338)		0.561 ** (0.102)
Staff	0.056 (0.074)	−0.738 * (0.379)	0.072 ** (0.029)	0.201 (0.128)
Year	−0.104 (0.084)	0.046 (0.368)	−0.072 (0.0543)	−0.530 (0.344)
Industry	−0.005 (0.022)	1.296 ** (0.197)	−0.054 ** (0.014)	0.018 (0.250)
Constant	3.956 ** (0.409)	−0.698 (1.315)	3.921 ** (0.223)	1.808 ** (0.559)
Observations	93	93	209	209
R-squared	0.015	0.403	0.106	0.361

Note: * indicates $p < 0.05$, ** indicates $p < 0.01$; ZY denotes the leader's Zhong-yong thinking, CP denotes coercive pressure, NP denotes normative pressure, and GI denotes green innovation.

5. Conclusions and Discussion

5.1. Conclusions

Drawing upon the tenets of upper echelons theory and managerial cognition theory, it is often asserted that executives' mental acuity and disposition can substantially impact the decision-making and conduct of their organizations. As a quintessential Chinese mindset, the Zhong-yong perspective allows entrepreneurs to adeptly navigate a multitude of considerations to strike an optimal equilibrium. Leaders may be spurred to espouse eco-friendliness and innovation in response to external institutional pressures and the need for sustainable development.

Therefore, this study developed a comprehensive framework by integrating leaders' Zhong-yong thinking, green innovation, and institutional pressure using a large sample survey of 302 Chinese companies. Through regression analysis and empirical tests using AMOS 26.0 and STATA 17.0, it was found that entrepreneurial Zhong-yong thinking helps companies carry out green innovation. Second, the results demonstrated that institutional pressure positively moderated the relationship between leaders' Zhong-yong thinking and corporate green innovation. Lastly, the study found that the influence of leaders' Zhong-yong thinking on green innovation was more significant in state-owned enterprises (SOEs) than in non-SOEs. This result shows that, in the Chinese context, SOEs differ from non-SOEs in terms of the resources they possess, the network of relationships they have, and the incentives they have for their goals, and that SOEs have more complex social relationships and more social responsibilities than non-SOEs.

5.2. Theoretical Implications

This study represents a novel effort to incorporate the findings of indigenous psychology—precisely, the concept of Zhong-yong thinking—into the analysis of corporate green innova-

tion theory, thus broadening the scope of antecedents driving corporate green innovation. Previous research has primarily focused on external factors, such as institutional constraints and environmental regulations, as drivers of corporate green innovation [73,74]. More recent studies have begun to explore the influence of internal factors, such as company executives, on green innovation [75,76]. This paper is consistent with [77], who proposed exploring how it affects GI within an organization or company from the perspective of top corporate executives [77]. However, these studies mainly focused on external characteristics, such as the demographics of corporate leaders [19], while undermining the impact of executives' values and perceptions of green innovation. This paper extends the study of managerial cognition in indigenous concepts based on managerial cognition theory [78,79]. Due to cultural differences, existing managerial cognition theories originated in Western contexts and may differ from the cognition of leaders in Eastern cultural contexts. As Zhong-yong thinking is an important part of Confucianism and is deeply rooted in the Chinese decision-making process, this study is based on the indigenous concept and examines its impact on green innovation from the perspective of traditional Chinese Zhong-yong thinking, which corresponds to the expansion of factors influencing corporate green innovation (Huang et al., 2016) [80]. This unique perspective not only increases the understanding of leaders' cognitive thinking in the innovation activities of Chinese enterprises, expands managers' cognitive theories, enriches the theoretical understanding of green innovation, and expands the study of corporate green innovation in the local context but also provides innovative ideas to promote sustainable corporate development. This research opens up a new avenue for exploration in corporate green innovation and its findings may have significant implications for business practices and environmental policy in China and beyond [81].

Another significant contribution of this study pertains to extending the traditional Zhong-yong philosophy. Zhong-yong thinking as an essential construct has been found to influence professional attitudes, behaviors, and outcomes [42,82,83]. Most of these studies have focused on the employee level, with only a few exploring its impact on corporate behavior based on the leader level [84]. This paper used the entrepreneurs' Zhong-yong thinking as the independent variable to reconcile the current debate on the role of Zhong-yong thinking of leaders in promoting corporate innovation [33]. The paper also complements the demographic-based upper echelons theory [43] by establishing a Zhong-yong leadership model, thereby enabling the development of Chinese management theory [85]. The paper expands leadership theories focusing mainly on Western contexts [86] by introducing local Chinese characteristics [87]. Based on the Eastern social and cultural context, the blend of China and the West has led to a collision of Eastern and Western management thinking [88,89].

Lastly, the study adds to the existing literature by examining the moderating roles of institutional pressure and firm ownership structure on the relationship between leaders' Zhong-yong thinking and green innovation. Previous research has emphasized the importance of external factors, such as institutional constraints and environmental regulations, on firms' innovation decisions [86,87]. In this paper, we explore the boundary role of institutional pressure on green innovation from two dimensions of institutional pressure, namely, coercive pressure and normative pressure. In addition, this study highlights the unique characteristics of the Chinese context, specifically the differences between SOEs and non-SOEs. Many previous studies have been conducted and explained in the context of firm performance, financial behavior, and corporate governance [90] and this paper extends them to the field of green innovation, examining their moderating effect on the relationship between Zhong-yong thinking and green innovation. These findings help establish the boundary conditions under which the application of Zhong-yong thinking affects green innovation and expand the context of institutional pressure and ownership structure under corporate green innovation [91]. This theoretical contribution responds to the call for further exploration of the influence of the external environment on power dynamics in both green innovation and leadership research.

5.3. Practical Implications

A few managerial implications drawn from the current study are as follows. The concept of Zhong-yong thinking has a long history, embodying the idea of harmonizing human nature and the universe, which can positively influence national thinking and behavior and promote green development. The current study calls for developing indigenous leadership models rather than copying Western systems. Chinese organizations are encouraged to rely on the essence of Zhong-yong thinking to establish a path of green development with characteristics that simultaneously benefit the economy and the environment. To promote green innovation, besides building formal systems such as laws and regulations, enterprises should also leverage cultural soft power, such as cultivating a Zhong-yong thinking culture to support sustainable development better. This approach is fundamental in advocating “carbon peak” and “carbon neutral” ideologies in China. Second, senior management—whose role is critical and decisive—is the key driving force behind green innovation within an enterprise. The present findings offer credible evidence for entrepreneurs and other senior leaders to leverage the wisdom of Zhong-yong thinking and actively fulfill their social responsibilities for environmental protection. They should also adopt a global and holistic perspective when proposing green innovation ideas in response to the ever-changing external environment, systems, and policies. In addition, they should strive to create a harmonious organizational atmosphere, encourage subordinates and employees to pay close attention to external environmental changes, and solicit specific green innovation suggestions from them. By integrating various opinions and ideas, the successful implementation of green innovation can be promoted. Furthermore, it is essential for leaders to actively learn from excellent traditional culture and make Zhong-yong thinking a behavioral norm in their daily management work. They should also actively fulfill their social responsibilities and integrate them into the construction of cultural soft power, thereby achieving the inheritance and innovation of Confucian culture in the new era.

Third, the empirical model encourages local governments to play a crucial role in guiding enterprises toward green innovation by implementing top-level design and utilizing government policies and social pressure. Such initiatives may include strengthening environmental regulations, improving laws and regulations related to energy consumption and waste disposal, investing in regional industrial pollution control, and increasing penalties for polluting enterprises. Such efforts can encourage entrepreneurs with Zhong-yong thinking to make management adjustments and establish energy-saving and emission-reduction systems while enhancing the green innovation capabilities of employees. In addition, the government can develop and implement green incentives such as subsidies, loans, and tax breaks related to green innovation to support businesses and promote proactive responses to environmental changes [89].

5.4. Research Limitations and Prospects

This study entails several limitations, providing directions for future research. A chief limitation of this study is the geographical context, i.e., the central region of China. The context and cross-sectional nature of data limit the generalization of findings. There is reason to believe that companies in other emerging markets may experience similar situations, such as institutional constraints. Still, China does have some peculiarities in its policies, social expectations, and culturally based norms. Therefore, extending the research context to multi-country settings in the future will further enhance the understanding of this issue on a broader level. In addition, cross-sectional study designs cannot establish causality arguments or avoid endogeneity problems. Future studies should use panel data or longitudinal designs to capture causality better and address potential endogeneity issues; with that said, it would be insightful to examine how the role between moderation thinking and green innovation among business leaders evolves to create a more efficient and dynamic condition to drive green transformation in business.

Third, the paper did not examine the heterogeneous effects of different types of social legitimacy [92]. Companies need to gain buy-ins from various stakeholders, such as governments, customers, and financial institutions, which can help them access different resources. Examining whether and how different types of legitimacy differ in directly and indirectly driving corporate green efforts is mandated.

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Appendix A

Table A1. Regional distribution of sample.

Province	Quantity	Province	Quantity	Province	Quantity
Fujian	77	Sichuan	4	Anhui	8
Guangdong	67	Jiangxi	9	Tianjin	2
Zhejiang	18	Yunnan	3	Hunan	6
Shanghai	15	Hebei	9	Beijing	9
Guangxi	3	Shandong	10	Shanxi	3
Henan	12	Jiangsu	12	Hubei	5
Jilin	3	Hainan	2	Shanxi	3
Ningxia	2	Liaoning	5	Chongqing	3
Neimenggu	2	Heilongjiang	3	others	3

Appendix B

Table A2. Results of hierarchical regression analysis (location control variable added).

Variables	(1) GI	(2) GI	(3) GI	(4) GI
ZY		0.598 ** (0.084)	−0.027 (0.292)	−0.163 (0.185)
Staff	0.056 * (0.03)	0.237 * (0.115)	0.114 (0.110)	0.115 (0.118)
Year	−0.077 + (0.0447)	−0.440 (0.269)	−0.382 + (0.226)	−0.362 (0.271)
Ownership	−0.097 * (0.043)	0.004 (0.093)	0.05 (0.084)	−0.012 (0.090)
Industry	−0.034 ** (0.010)	−0.066 (0.203)	−0.021 (0.189)	−0.038 (0.208)
Location	0.011 + (0.006)	0.005 (0.005)	0.003 (0.005)	0.002 (0.005)

Table A2. Cont.

Variables	(1) GI	(2) GI	(3) GI	(4) GI
NP			−0.107 (0.278)	
ZY × NP			0.126 + (0.073)	
CP				−0.166 (0.186)
ZY × CP				0.145 ** (0.047)
Constant	4.022 ** (0.203)	1.622 ** (0.491)	2.544 * (1.143)	3.005 ** (0.786)
Observations	302	302	302	302
R-squared	0.096	0.359	0.464	0.425

Note: + indicates $p < 0.1$, * indicates $p < 0.05$, ** indicates $p < 0.01$ (same as below), and × indicates multiplication. ZY denotes the leader's Zhong-yong thinking, CP denotes coercive pressure, NP denotes normative pressure, and GI denotes green innovation.

Appendix C

Table A3. Results of sub-sample hierarchical regression analysis (location control variable added).

Variables	SOEs (N = 93)		Non-SOEs (N = 209)	
	(5) GI	(6) GI	(7) GI	(8) GI
ZY		0.864 ** (0.310)		0.525 ** (0.089)
Staff	0.054 (0.065)	0.268 (0.521)	0.075 * (0.029)	0.184 (0.121)
Year	−0.111 (0.072)	−0.205 (0.412)	−0.109 * (0.053)	−0.489 (0.342)
Industry	0.009 (0.018)	0.396 (0.279)	−0.057 ** (0.013)	−0.055 (0.229)
Location	0.003 (0.009)	0.001 (0.010)	0.011 (0.007)	0.007 (0.007)
Constant	3.846 ** (0.316)	0.003 (1.232)	3.958 ** (0.221)	1.969 ** (0.500)
Observations	93	93	209	209
R-squared	0.017	0.379	0.148	0.382

Note: * denotes $p < 0.05$, ** denotes $p < 0.01$; ZY denotes the leader's Zhong-yong thinking, CP denotes coercive pressure, NP denotes normative pressure, and GI denotes green innovation.

References

- Hao, Y.; Gai, Z.; Wu, H. How do resource misallocation and government corruption affect green total factor energy efficiency? Evidence from China. *Energy Policy* **2020**, *143*, 111562. [[CrossRef](#)]
- Ling, G.; Razzaq, A.; Guo, Y.; Fatima, T.; Shahzad, F. Asymmetric and time-varying linkages between carbon emissions, globalization, natural resources and financial development in China. *Environ. Dev. Sustain.* **2022**, *24*, 6702–6730. [[CrossRef](#)] [[PubMed](#)]
- Wu, H.; Hao, Y.; Weng, J.-H. How does energy consumption affect China's urbanization? New evidence from dynamic threshold panel models. *Energy Policy* **2019**, *127*, 24–38. [[CrossRef](#)]
- Hao, Y.; Gai, Z.; Yan, G.; Wu, H.; Irfan, M. The spatial spillover effect and nonlinear relationship analysis between environmental decentralization, government corruption and air pollution: Evidence from China. *Sci. Total Environ.* **2021**, *763*, 144183. [[CrossRef](#)]
- Ren, S.; Hao, Y.; Xu, L.; Wu, H.; Ba, N. Digitalization and energy: How does internet development affect China's energy consumption? *Energy Econ.* **2021**, *98*, 105220. [[CrossRef](#)]
- Kawai, N.; Strange, R.; Zucchella, A. Stakeholder pressures, EMS implementation, and green innovation in MNC overseas subsidiaries. *Int. Bus. Rev.* **2018**, *27*, 933–946. [[CrossRef](#)]
- Lee, K.-H.; Kim, J.-W. Integrating suppliers into green product innovation development: An empirical case study in the semiconductor industry. *Bus. Strategy Environ.* **2011**, *20*, 527–538. [[CrossRef](#)]

8. Wagner, M. Empirical influence of environmental management on innovation: Evidence from Europe. *Ecol. Econ.* **2008**, *66*, 392–402. [\[CrossRef\]](#)
9. Albort-Morant, G.; Henseler, J.; Leal-Millán, A.; Cepeda-Carrión, G. Mapping the field: A bibliometric analysis of green innovation. *Sustainability* **2017**, *9*, 1011. [\[CrossRef\]](#)
10. Arenhardt, D.; Battistella, L.F.; Grohmann, M.Z. The influence of the green innovation in the search of competitive advantage of enterprises of the electrical and electronic Brazilian sectors. *Int. J. Innov. Manag.* **2016**, *20*, 1650004. [\[CrossRef\]](#)
11. Chen, P.-C.; Hung, S.-W. Collaborative green innovation in emerging countries: A social capital perspective. *Int. J. Oper. Prod. Manag.* **2014**, *34*, 347–363. [\[CrossRef\]](#)
12. Dangelico, R.M. Green product innovation: Where we are and where we are going. *Bus. Strategy Environ.* **2016**, *25*, 560–576. [\[CrossRef\]](#)
13. Montalvo, C. General wisdom concerning the factors affecting the adoption of cleaner technologies: A survey 1990–2007. *J. Clean. Prod.* **2008**, *16*, S7–S13. [\[CrossRef\]](#)
14. Porter, M.; Van der Linde, C. Green and competitive: Ending the stalemate. *Dyn. Eco-Effic. Econ. Environ. Regul. Compet. Advant.* **1995**, *33*, 120–134.
15. Yalabik, B.; Fairchild, R.J. Customer, regulatory, and competitive pressure as drivers of environmental innovation. *Int. J. Prod. Econ.* **2011**, *131*, 519–527. [\[CrossRef\]](#)
16. Saunila, M.; Ukko, J.; Rantala, T. Sustainability as a driver of green innovation investment and exploitation. *J. Clean. Prod.* **2018**, *179*, 631–641. [\[CrossRef\]](#)
17. Huang, Z.; Liao, G.; Li, Z. Loaning scale and government subsidy for promoting green innovation. *Technol. Forecast. Soc. Change* **2019**, *144*, 148–156. [\[CrossRef\]](#)
18. Yin, J.H.; Shuang, Q. CEO's Academic Experience and Enterprise's Green Innovation: The Dual Perspective Environmental Attentional location and Industry University Research Cooperation Empowerment. *Sci. Technol. Prog. Policy* **2023**, *40*, 141–151. [\[CrossRef\]](#)
19. Wang, W.D.; Shen, Y.; Wang, X.N.; Lu, N. Female Executive Power and Enterprise Green Innovation. *East China Econ. Manag.* **2022**, *36*, 54–64. [\[CrossRef\]](#)
20. Hambrick, D.C.; Mason, P.A. Upper echelons: The organization as a reflection of its top managers. *Acad. Manag. Rev.* **1984**, *9*, 193–206. [\[CrossRef\]](#)
21. Peng, K.; Nisbett, R.E. Culture, dialectics, and reasoning about contradiction. *Am. Psychol.* **1999**, *54*, 741–754. [\[CrossRef\]](#)
22. Lang, Y.; Zhang, F.; Yin, J. Team zhongyong thinking and team incremental and radical creativity. *J. Innov. Knowl.* **2022**, *7*, 100196. [\[CrossRef\]](#)
23. Pian, Q.; Zhang, L.; Li, C. The cultural drive of innovative behavior: Cross-level impacts of Leader-Employee's Zhong-Yong orientation. *Innovation* **2022**, 1–30. [\[CrossRef\]](#)
24. Zhou, Z.; Zhang, H.; Li, M.; Sun, C.; Luo, H. The Effects of Zhongyong Thinking Priming on Creative Problem-Solving. *J. Creat. Behav.* **2020**, *55*, 145–153. [\[CrossRef\]](#)
25. Du, J.; Ran, M.; Cao, P. Context-contingent Effect of Zhongyong on Employee Innovation Behavior. *Acta Psychol. Sin.* **2014**, *46*, 113–124. [\[CrossRef\]](#)
26. Yang, C.F. Multiplicity of zhong yong studies. *Indig. Psychol. Res. Chin. Soc.* **2010**, *34*, 3–96.
27. Ning, B.; Omar, R.; Ye, Y.; Ting, H.; Ning, M. The role of Zhong-Yong thinking in business and management research: A review and future research agenda. *Asia Pac. Bus. Rev.* **2021**, *27*, 150–179. [\[CrossRef\]](#)
28. Doyle, W.; Fisher, R.; Young, J.D. Entrepreneurs: Relationships between Cognitive Style and Entrepreneurial Drive. *J. Small Bus. Entrep.* **2002**, *16*, 2–20. [\[CrossRef\]](#)
29. Sadler-Smith, E. Cognitive Style and the Management of Small and Medium-Sized Enterprises. *Organ. Stud.* **2004**, *25*, 155–181. [\[CrossRef\]](#)
30. Armstrong, S.J.; Hird, A. Cognitive Style and Entrepreneurial Drive of New and Mature Business Owner-Managers. *J. Bus. Psychol.* **2009**, *24*, 419–430. [\[CrossRef\]](#)
31. Pierce, J.R.; Aguinis, H. The Too-Much-of-a-Good-Thing Effect in Management. *J. Manag.* **2011**, *39*, 313–338. [\[CrossRef\]](#)
32. Ji, L.-J.; Lee, A.; Guo, T. The thinking styles of Chinese people. In *Oxford Handbook of Chinese Psychology*; Michael, H.B., Ed.; Oxford Library of Psychology: Oxford, UK, 2012. [\[CrossRef\]](#)
33. Wu, C.H.; Lin, Y.C. Development of a Zhong-Yong thinking style scale. *Indig. Psychol. Res. Chin. Soc.* **2005**, *24*, 247–300.
34. Yang, X.; Zhang, P.; Zhao, J.; Zhao, J.; Wang, J.; Chen, Y.; Ding, S.; Zhang, X. Confucian culture still matters: The benefits of Zhongyong thinking (doctrine of the mean) for mental health. *J. Cross-Cult. Psychol.* **2016**, *47*, 1097–1113. [\[CrossRef\]](#)
35. Chou, L.-F.; Chu, C.-C.; Yeh, H.-C.; Chen, J. Work stress and employee well-being: The critical role of Zhong-Yong. *Asian J. Soc. Psychol.* **2014**, *17*, 115–127. [\[CrossRef\]](#)
36. Wei, J.; Chen, Y.; Zhang, Y.; Zhang, J. How Does Entrepreneurial Self-Efficacy Influence Innovation Behavior? Exploring the Mechanism of Job Satisfaction and Zhongyong Thinking. *Front. Psychol.* **2020**, *11*, 708. [\[CrossRef\]](#)
37. Chen, Y.; Wei, J.; Zhang, J.; Li, X. Effect Mechanism of Error Management Climate on Innovation Behavior: An Investigation from Chinese Entrepreneurs. *Front. Psychol.* **2021**, *12*, 733741. [\[CrossRef\]](#)
38. Rennings, K.; Zwick, T. Employment impact of cleaner production on the firm level: Empirical evidence from a survey in five European countries. *Int. J. Innov. Manag.* **2002**, *06*, 319–342. [\[CrossRef\]](#)

39. Chu, Z.; Wang, L.; Lai, F. Customer pressure and green innovations at third party logistics providers in China: The moderation effect of organizational culture. *Int. J. Logist. Manag.* **2019**, *30*, 57–75. [\[CrossRef\]](#)
40. Le, T.T. How do corporate social responsibility and green innovation transform corporate green strategy into sustainable firm performance? *J. Clean. Prod.* **2022**, *362*, 132228. [\[CrossRef\]](#)
41. Ma, C.; Liu, H.; Gu, J.; Dou, J. How entrepreneurs' Zhong-yong thinking improves new venture performance: The mediating role of guanxi and the moderating role of environmental turbulence. *Chin. Manag. Stud.* **2018**, *12*, 323–345. [\[CrossRef\]](#)
42. Pan, W.; Sun, L.-Y. A Self-Regulation Model of Zhong Yong Thinking and Employee Adaptive Performance. *Manag. Organ. Rev.* **2017**, *14*, 135–159. [\[CrossRef\]](#)
43. Qi, G.Y.; Shen, L.Y.; Zeng, S.X.; Jorge, O.J. The drivers for contractors' green innovation: An industry perspective. *J. Clean. Prod.* **2010**, *18*, 1358–1365. [\[CrossRef\]](#)
44. Suasana, I.G.A.K.G.; Ekawati, N.W. Environmental commitment and green innovation reaching success new products of creative industry in Bali. *J. Bus. Retail. Manag. Res.* **2018**, *12*, 246–250. [\[CrossRef\]](#)
45. Rennings, K. Redefining innovation—Eco-innovation research and the contribution from ecological economics. *Ecol. Econ.* **2000**, *32*, 319–332. [\[CrossRef\]](#)
46. Chou, C.-J. Hotels' environmental policies and employee personal environmental beliefs: Interactions and outcomes. *Tour. Manag.* **2014**, *40*, 436–446. [\[CrossRef\]](#)
47. Huang, J.-W.; Li, Y.-H. Green Innovation and Performance: The View of Organizational Capability and Social Reciprocity. *J. Bus. Ethics* **2015**, *145*, 309–324. [\[CrossRef\]](#)
48. Roy, M.; Khastagir, D. Exploring role of green management in enhancing organizational efficiency in petro-chemical industry in India. *J. Clean. Prod.* **2016**, *121*, 109–115. [\[CrossRef\]](#)
49. Stanovic, T.; Pekovic, S.; Bouziri, A. The effect of knowledge management on environmental innovation: The empirical evidence from France. *Balt. J. Manag.* **2015**, *10*, 413–431. [\[CrossRef\]](#)
50. Tseng, M.-L.; Tan, R.R.; Siriban-Manalang, A.B. Sustainable consumption and production for Asia: Sustainability through green design and practice. *J. Clean. Prod.* **2013**, *40*, 1–5. [\[CrossRef\]](#)
51. Song, M.; Chen, M.; Wang, S. Global supply chain integration, financing restrictions, and green innovation: Analysis based on 222,773 samples. *Int. J. Logist. Manag.* **2018**, *29*, 539–554. [\[CrossRef\]](#)
52. Suchman, M.C. Managing Legitimacy: Strategic and Institutional Approaches. *Acad. Manag. Rev.* **1995**, *20*, 571–610. [\[CrossRef\]](#)
53. Alrazi, B.; de Villiers, C.; van Staden, C.J. A comprehensive literature review on, and the construction of a framework for, environmental legitimacy, accountability and proactivity. *J. Clean. Prod.* **2015**, *102*, 44–57. [\[CrossRef\]](#)
54. Hall, B.H.; Mairesse, J. Exploring the relationship between R&D and productivity in French manufacturing firms. *J. Econ.* **1995**, *65*, 263–293. [\[CrossRef\]](#)
55. Cao, H.; Chen, Z. The driving effect of internal and external environment on green innovation strategy—The moderating role of top management's environmental awareness. *Nankai Bus. Rev. Int.* **2019**, *10*, 342–361. [\[CrossRef\]](#)
56. Bansal, P.; Clelland, I. Talking Trash: Legitimacy, Impression Management, and Unsystematic Risk in the Context of the Natural Environment. *Acad. Manag. J.* **2004**, *47*, 93–103. [\[CrossRef\]](#)
57. Liu, H.; Ke, W.; Wei, K.K.; Gu, J.; Chen, H. The role of institutional pressures and organizational culture in the firm's intention to adopt internet-enabled supply chain management systems. *J. Oper. Manag.* **2009**, *28*, 372–384. [\[CrossRef\]](#)
58. Liao, Z.; Zhang, M.; Wang, X. Do female directors influence firms' environmental innovation? The moderating role of ownership type. *Corp. Soc. Responsib. Environ. Manag.* **2018**, *26*, 257–263. [\[CrossRef\]](#)
59. Wu, C.Q.; Qian, T. Business Group Affiliation and the Governance of State-Owned Enterprises. *Econ. Res. J.* **2011**, *46*, 93–104.
60. Tan, J.; Tan, D. Environment-strategy co-evolution and co-alignment: A staged model of Chinese SOEs under transition. *Strat. Manag. J.* **2004**, *26*, 141–157. [\[CrossRef\]](#)
61. Bruton, G.D.; Lan, H.; Lü, Y. China's township and village enterprises: Kelon's competitive edge. *Acad. Manag. Perspect.* **2000**, *14*, 19–27. [\[CrossRef\]](#)
62. Li, Q.; Luo, W.; Wang, Y.; Wu, L. Firm performance, corporate ownership, and corporate social responsibility disclosure in China. *Bus. Ethics A Eur. Rev.* **2013**, *22*, 159–173. [\[CrossRef\]](#)
63. Megginson, W.L.; Netter, J.M. From State to Market: A Survey of Empirical Studies on Privatization. *J. Econ. Lit.* **2001**, *39*, 321–389. [\[CrossRef\]](#)
64. Bar, E.S. A case study of obstacles and enablers for green innovation within the fish processing equipment industry. *J. Clean. Prod.* **2015**, *90*, 234–243. [\[CrossRef\]](#)
65. Peters, K.; Buijs, P. Strategic ambidexterity in green product innovation: Obstacles and implications. *Bus. Strategy Environ.* **2022**, *31*, 173–193. [\[CrossRef\]](#)
66. Zhou, H.; Yang, Y. How does employees' Zhong-Yong thinking improve their innovative behaviours? The moderating role of person-organisation fit. *Technol. Anal. Strat. Manag.* **2021**, *34*, 803–814. [\[CrossRef\]](#)
67. Wang, C.H. An environmental perspective extends market orientation: Green innovation sustainability. *Bus. Strat. Environ.* **2020**, *29*, 3123–3134. [\[CrossRef\]](#)
68. Yu, C.P.; Lin, C.P.; Zhang, Z.G.; Ye, B. Specialized knowledge search, management innovation and firm performance: The moderating effect of cognitive appraisal. *Manag. World* **2020**, *1*, 146–166.

69. Podsakoff, P.M.; MacKenzie, S.B.; Podsakoff, N.P. Sources of method bias in social science research and recommendations on how to control it. *Annu. Rev. Psychol.* **2012**, *63*, 539–569. [\[CrossRef\]](#)
70. Dastmalchian, A.; Bacon, N.; McNeil, N.; Steinke, C.; Blyton, P.; Satish Kumar, M.; Bayraktar, S.; Auer-Rizzi, W.; Bodla, A.A.; Cotton, R.; et al. High-performance work systems and organizational performance across societal cultures. *J. Int. Bus. Stud.* **2020**, *51*, 353–388. [\[CrossRef\]](#)
71. Yu, C.; Wang, Y.; Li, T.; Lin, C. Do top management teams' expectations and support drive management innovation in small and medium-sized enterprises? *J. Bus. Res.* **2022**, *142*, 88–99. [\[CrossRef\]](#)
72. Xu, C.C.; Zhang, W.C. Theoretic Foundation of the Existence of State-owned Economy. *Jilin Univ. J. Soc. Sci. Ed.* **2002**, *5*, 37–45.
73. Li, D.; Zheng, M.; Cao, C.; Chen, X.; Ren, S.; Huang, M. The impact of legitimacy pressure and corporate profitability on green innovation: Evidence from China top 100. *J. Clean. Prod.* **2017**, *141*, 41–49. [\[CrossRef\]](#)
74. Qi, G.; Jia, Y.; Zou, H. Is institutional pressure the mother of green innovation? Examining the moderating effect of absorptive capacity. *J. Clean. Prod.* **2020**, *278*, 123957. [\[CrossRef\]](#)
75. Su, X.; Xu, A.; Lin, W.; Chen, Y.; Liu, S.; Xu, W. Environmental Leadership, Green Innovation Practices, Environmental Knowledge Learning, and Firm Performance. *SAGE Open* **2020**, *10*, 2158244020922909. [\[CrossRef\]](#)
76. Zhang, B.; Wang, Z.; Lai, K.-H. Mediating effect of managers' environmental concern: Bridge between external pressures and firms' practices of energy conservation in China. *J. Environ. Psychol.* **2015**, *43*, 203–215. [\[CrossRef\]](#)
77. Takalo, S.K.; Tooranloo, H.S.; Parizi, Z.S. Green innovation: A systematic literature review. *J. Clean. Prod.* **2021**, *279*, 122474. [\[CrossRef\]](#)
78. Walsh, J.P. Managerial and Organizational Cognition: Notes from a Trip Down Memory Lane. *Organ. Sci.* **1995**, *6*, 280–321. [\[CrossRef\]](#)
79. Kaplan, S. Research in Cognition and Strategy: Reflections on Two Decades of Progress and a Look to the Future. *J. Manag. Stud.* **2011**, *48*, 665–695. [\[CrossRef\]](#)
80. Huang, X.-X.; Hu, Z.-P.; Liu, C.-S.; Yu, D.-J.; Yu, L.-F. The relationships between regulatory and customer pressure, green organizational responses, and green innovation performance. *J. Clean. Prod.* **2016**, *112*, 3423–3433. [\[CrossRef\]](#)
81. Yang, Z.F. A case of attempt to combine the Chinese traditional culture with the social science: The social psychological research of “zhongyong”. *J. Renmin Univ. China* **2009**, *23*, 53–60.
82. Qu, Y.; Wu, W.; Tang, F.; Si, H.; Xia, Y. Why do I conform to your ideas? The role of coworkers' regulatory focus in explaining the influence of zhongyong on harmony voice. *Chin. Manag. Stud.* **2018**, *12*, 346–368. [\[CrossRef\]](#)
83. Yuan, L.; Chia, R. The effect of traditional Chinese fuzzy thinking on human resource practices in mainland China. *Chin. Manag. Stud.* **2011**, *5*, 431–449. [\[CrossRef\]](#)
84. Zhang, X.Z. The spirit and values of Confucian culture. *J. Peking Univ. (Philos. Soc. Sci.)* **1998**, *1*, 88–95.
85. Chuang, A.; Hsu, R.S.; Wang, A.-C.; Judge, T.A.; Barkema, H.G.; Chen, X.-P.; George, G.; Luo, Y.; Tsui, A.S.; Harrison, S.H.; et al. Does West “Fit” with East? In Search of a Chinese Model of Person–Environment Fit. *Acad. Manag. J.* **2015**, *58*, 480–510. [\[CrossRef\]](#)
86. Feng, W.; Mu, Y.; Qu, R. External Green Pressure, Environmental Commitment and Green Innovation Strategy of Manufacturing Enterprises: The Moderating Role of Organizational Slack. *J. Northeast. Univ. (Soc. Sci.)* **2023**, *25*, 35–46. [\[CrossRef\]](#)
87. Prajogo, D.; Tang, A.K.Y.; Lai, K.-H. Do firms get what they want from ISO 14001 adoption? An Australian perspective. *J. Clean. Prod.* **2012**, *33*, 117–126. [\[CrossRef\]](#)
88. Barkema, H.G.; Chen, X.-P.; George, G.; Luo, Y.; Tsui, A.S.; Malesky, E.; Taussig, M.; Liu, D.; Gong, Y.; Zhou, J.; et al. West Meets East: New Concepts and Theories. *Acad. Manag. J.* **2015**, *58*, 460–479. [\[CrossRef\]](#)
89. Wiklund, J.; Shepherd, D. Entrepreneurial orientation and small business performance: A configurational approach. *J. Bus. Ventur.* **2005**, *20*, 71–91. [\[CrossRef\]](#)
90. Lin, K.J.; Lu, X.; Zhang, J.; Zheng, Y. State-owned enterprises in China: A review of 40 years of research and practice. *China J. Account. Res.* **2020**, *13*, 31–55. [\[CrossRef\]](#)
91. Berrone, P.; Fosfuri, A.; Gelabert, L.; Gomez-Mejia, L.R. Necessity as the mother of ‘green’ inventions: Institutional pressures and environmental innovations. *Strat. Manag. J.* **2012**, *34*, 891–909. [\[CrossRef\]](#)
92. Aldrich, H.E.; Fiol, C.M. Fools Rush in? The Institutional Context of Industry Creation. *Acad. Manag. Rev.* **1994**, *19*, 645–670. [\[CrossRef\]](#)

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