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## Exploring Entrepreneurial Orientation, Green Innovation, and Corporate Sustainability Performance: Examining Mediation Role of Entrepreneurial Orientation

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### Abstract

The study aims to recognize entrepreneurial orientation's multifaceted role in green innovation, & corporate sustainability performance. Utilizing a sample of 339 questionnaires from Pakistani manufacturing enterprises, the research adopted a mediation strategy and a quantitative analytic technique to examine hypothesized correlations among the variables. Empirical results and findings demonstrate that a company's corporate sustainability performance affects its green innovation. This study offers industrial companies useful information on how to operate sustainably and lessen their environmental effect. Moreover, businesses that want to achieve sustainable green performance should embrace ambidextrous innovation and green entrepreneurship in addition to proactive environmental initiatives. Based on the study's findings, implications and recommendations are offered.

**Keywords: Entrepreneurial Orientation, Green Innovation, Corporate Sustainability**

**Performance, Manufacturing industry**

## **Introduction**

In the globalization era, the insistence on corporate sustainability has developed drastically. Likewise, manufacturing companies have minimized negative effects and maintained economic operations sustainability as a result of pressures connected to resource shortages (Khan et al., 2024). The green innovation concept addresses businesses to achieve long-term goals by educating employees and motivating them for corporate sustainability performance. Over the last several decades, researchers have paid more attention to sustainable corporate performance. As for addressing these environmental challenges green innovation, firms green innovation has become a viable competitive advantage. Additionally, reducing turnover intentions among skilled employees is a critical challenge.

Green innovation has recently attracted interest among academics and practitioners from the perspectives of both employees and their firms (Padilla-Lozano et al., 2024). Prior studies have shown that green innovation is an effective tool for implementing green supply chain management (Li et al., 2024) and for linking stakeholders to CSP (Makhloufi, 2024). However, certain aspects concerning green innovation have yet to be thoroughly investigated. Prior studies also considered full attention behind above relationship and peruse more empirical research between specific relationships. As the push for sustainable practices continues to grow, delving deeper into these connections will be essential for both theoretical development and practical application in the field.

To explore how green innovation can improve corporate sustainability performance, green innovation behaviours are integrated into our research model based on organizational learning

theory. Although green innovation provides more sustainable corporate practices (Fosu et al., 2024a), it also has an indirect relationship through entrepreneurship orientation. Green innovation initiatives inside businesses are greatly aided by entrepreneurial orientation, which is defined by creativity, proactivity, and risk-taking. This approach improves the company's capacity to adjust to changing market conditions and environmental concerns while also creating a favourable atmosphere for the adoption of cutting-edge green practices. This relationship further enhances green innovation's favourable impact on corporate sustainability performance, as organizations with a strong entrepreneurial orientation are more inclined to develop and deploy green technologies. To completely grasp the underlying mechanisms and mediating factors, however, more empirical research is necessary for the complexity of the relationship between green innovation, entrepreneurial orientation, and CSP. Researchers should carefully examine green innovation dynamics as a strategic tool for long-term sustainability goals (Makhloufi, 2024; Guo et al., 2020).

Organizational learning theory has emphasized that both exploratory learning and exploitative learning are significant for organizations to survive in the long term (Khan et al., 2024). For this reason, synchronously pursuing two disparate learning approaches, exploration and exploitation, appears crucial for analyzing when green innovation might strengthen corporate sustainability performance. However, it has yet to be understood whether green innovation impacts corporate sustainability performance.

Moreover, while existing research has shown that a firm's entrepreneurial orientation positively influences its overall performance (Crick & Crick, 2023), the entrepreneurial orientation's role in enhancing the connection between green innovation behaviours and corporate sustainability performance still needs to be explored. To deepen our understanding of how green innovation

impacts corporate sustainability performance, we incorporate entrepreneurial orientation into our research model and examine the mediation effect on the relationship between green innovation and CSP.

This study seeks to provide a more nuanced perspective on the impact of green innovation on corporate sustainability performance. First, we investigate the direct relationship between green innovation and sustainability outcomes through the organizational learning theory lens. Second, analyzing how entrepreneurial orientation might conditionally influence the indirect effects of green innovation on sustainability performance through a mediation model. By doing so, our research contributes to green innovation and sustainability, offering insights into whether and how green innovation can drive corporate sustainability performance. From an empirical standpoint, this study also sheds light on practical strategies for aligning green innovation behaviours with a firm's learning capacity, thereby enabling companies to achieve their sustainability goals more effectively.

## **Literature Review**

### **Green Innovation and Corporate Sustainability Performance**

G.I. is one of the core means through which organizations try to minimize or eliminate the negative effect of their production and manufacturing operations on the natural environment (Ch'ng et al., 2021). Green Innovation refers to process advancement, products, technologies, and management structures that minimize waste, reduce resource consumption, and protect the environment (Singh et al., 2020). G.I. products, processes, and practices are increasingly recognized as a critical element of sustainable corporate performance. This relationship stems from the understanding that organizations that invest in green innovation are better equipped to meet the growing demands for sustainability from consumers, regulators, and other stakeholders.

It is also a crucial success factor for CSP because it offers more flexibility and better performance through employees' green innovation (Fosu et al., 2024).

Moreover, green innovation can drive long-term competitiveness by opening up new markets and business opportunities. Studies have shown that firms with a strong commitment to green innovation often achieve better environmental outcomes, such as reduced carbon emissions and waste, while simultaneously experiencing improved financial metrics like return on investment and profitability (Almeida & Wasim, 2023). Therefore, green innovation catalyzes achieving sustainable corporate performance, offering a competitive advantage in today's sustainable corporate performance. Therefore, the hypothesis that:

**H1: G.I. has a positive and significant influence on CSP**

### **Green innovation and Entrepreneurship orientation**

E.O. provides the capability to explore new market opportunities and competitive advantage to firms (Khan et al., 2023). Firms with a high-level E.O. improve their products and processes by actively searching for novel knowledge. Entrepreneurial activities enhance the firms' networks and provide opportunities to collaborate with various stakeholders such as customers, suppliers, and different social and institutional actors. According to Wang et al. (2023), the study explores how firms can effectively translate their entrepreneurial drive towards environmental sustainability into concrete innovative outcomes. Similarly, Shehzad et al. (2023) also recommend that E.O. drives firms towards sustainability-oriented innovation; the actual green innovation implementation is significantly influenced by entrepreneurship orientation. The study also discovers that firms with a strong E.O. are more likely to pursue green innovation because of environmental sustainability commitment and their proactive stance in seeking eco-friendly opportunities. It is, therefore, crucial for organizations to encourage their employees to be

proactive, to try new things and to find new ways to do old things to increase their ability to innovate new products and services. Furthermore, such an orientation encourages the continuation of innovative activities. The E.O. concept, which supports innovation projects by combining existing resources to learn through new inputs, create new products/services, commercialize them, penetrate new markets, and serve new customers, is regarded as an essential part of the innovation process. Therefore, hypothesized that:

**H2: G.I. has a positive and significant influence on E.O.**

**G.I., CSP and E.O.**

As explained earlier, G.I. is the applicability of new technology advancement that will help reduce production costs and pollution and increase an enterprise's market share. It also develops innovative products and services, builds well-known brands and achieves a competitive advantage (Makhloufi, 2024; Al-Swidi et al., 2024). Most studies have targeted factors encouraging G.I. (Mao et al., 2021); however, limited sustainable corporate performance perceptions and entrepreneurship orientation. Moreover, E.O. and CSP play significant roles in encouraging individuals to act in a green manner and to direct firms' behaviour towards developing innovative items. Prior research also argues that E.O. positively influences firm green performance through green innovation ([Ahmed et al., 2023](#)). Likewise, green innovation would also significantly influence trust and CSP.

Furthermore, individuals with higher G.O. could utilize better available resources, reduce negative environmental effects and develop new innovative ideas development ([Mao et al., 2021](#)) that would lead to more CSP ([Haque & Ntim, 2018](#)). Empirically, there has been some confirmation of the connection between CSP and G.I. ([Mao et al., 2021](#)). In addition, researchers have confirmed the positive relationship between E.O. and G.I., such as (Khan et al., 2023).

Some evidence has also been reported on the role played by G.I. and E.P. (Guo et al., 2021). Researchers also believe that E.O. could lead to G.I., while G.I. could interact with CSP. Therefore, the hypothesis that:

**H3: E.O. has a mediating relationship via G.I. and CSP**

**Research Method**

**Target population and sampling procedure**

This research aimed to identify the mediating role of entrepreneurial orientation between green innovation and sustainable corporate performance. For this purpose, we collected data from Pakistan's manufacturing sector enterprises. Only those firms were selected that have at least 100 employees working in the manufacturing department. Moreover, a self-administered questionnaire was employed to collect data from sample firms using convenience sampling. The questionnaire was designed in English, and the items were chosen from prior studies. All items were measured using a five-point Likert scale, ranging from '1' representing strongly disagree, to '5' representing strongly agree. A total of 463 questionnaires were distributed, and only 354 returned. However, 15 questionnaires were eliminated due to missing data, so 339 questionnaires were utilized. The detailed demographics of the survey participants are shown in Table 1.

**Measurement Instrument**

The entire questionnaire items utilized were derived from existing literature references. A seven-point Likert scale, ranging from "one" (strongly disagreed) to "seven" (strongly agreed), was utilized. First, Chen et al. (2013) provided a source for thirteen items that were adopted for green innovation. Sample items include our organization using less or non-polluting/toxic materials. Cronbach Alpha is recording 0.78. Second, 10 items for entrepreneurship orientation were chosen from Eggers et al. (2013). E.O. consists of 5 items from ris and an item from

preactiveness. Sample items included: 'Our firm organization has a tendency to initiate green actions for competitors to respond to'; 'Our firm organization has a strong emphasis on green R&D, technological leadership, and innovation.' Cronbach alpha recorded 0.83. Corporate sustainability performance was measured via 10 items measuring economic, environmental, and social aspects of corporate sustainability performance adapted by (Grybauskas et al., 2022; Fok et al., 2022) study. Sample items included: 'Our organization has achieved important environment-related certifications' and 'Our organization has decreased the cost of energy consumption.' Cronbach alpha recorded 0.85. However, two items from E.O. proactiveness were excluded due to factor loadings below 0.5 (Hair Jr. et al., 2021).

## Data Analysis

### Demographics Analysis

Table 1 displays the respondents' characteristics. In terms of experience, the majority of employees have one to two years. Overall, manufacturing firms had approximately 10 million sales, while employees ranged from one to forty-one and forty-one more.

**Table 1: Demographics characteristics**

	Description	Total	%
<b>Experience</b>	1-2 Years	124	36.58
	3-4 Years	96	28.32
	5-6 Years	62	18.29
	7 & more	57	16.81
<b>Sales</b>	>10 Million	109	32.15
	>20	84	24.78



	>30	79	23.3
	<31	67	19.77
<b>No. of Employees</b>	1-4 employees	127	37.46
	5-20 employees	57	16.81
	21-40 employees	85	25.07
	41 and more employees	70	20.66

### Descriptive Statistics

Table 2 presents descriptive statistics for various items across three categories: G.I., CSP, and E.O. Each item has been evaluated on a scale of 1 to 5, with the results showing the mean, standard deviation (S.D.), minimum (Min), and maximum (Max) values.

For the Green Innovation (G.I.) items, mean scores range from 3.8 to 4.6, indicating generally high responses, with most items having an SD of 0.7 to 0.8. Notably, GI1 has the highest mean score of 4.6 (S.D. = 0.7), while GI6 has the lowest mean of 3.8 (S.D. = 1.1), suggesting a greater variation in responses for this item. Corporate sustainability performance (CSP) items show a broader range of mean scores, from 3.7 to 4.5, with standard deviations ranging from 0.7 to 1.1. CSP2 has the highest mean score of 4.5 (S.D. = 0.7), similar to the higher scores seen in the G.I. items, while CSP8 has the lowest mean of 3.7 (S.D. = 1.0). Several CSP items indicate standard deviation scores of CSP1 and CSP3, indicating greater variability in responses. Entrepreneurial Orientation (E.O.) scale items mean scores are consistently high, ranging from 4.1 to 4.4 and S.D. from 0.7 to 0.9. The highest mean score was observed in EO1 at 4.4 (S.D. = 0.7), while the lowest mean was 4.1 for EO6 (S.D. = 0.9). The data suggests that respondents generally rated the E.O. items favourably, with relatively low variability across these items. Overall, the results

indicate strong responses across all categories, with some variability, particularly CSP items. The consistency in mean scores, especially within the E.O. and G.I. categories, suggests a generally positive perception or experience related to the items measured.

**Table 2: Descriptive Statistics**

<b>items</b>	<b>Mean</b>	<b>S.D</b>	<b>Min</b>	<b>Max</b>
<b>GI 1</b>	4.6	0.7	1	5
<b>G.I. 2</b>	4.5	0.7	1	5
<b>G.I. 3</b>	4.5	0.7	1	5
<b>G.I. 4</b>	4.3	0.8	1	5
<b>G.I. 5</b>	4.3	0.8	1	5
<b>G.I. 6</b>	3.8	1.1	1	4
<b>G.I. 7</b>	4.1	0.8	1	5
<b>G.I. 8</b>	4.3	0.8	1	5
<b>G.I. 9</b>	4.2	0.8	1	5
<b>G.I. 10</b>	4	0.9	2	4
<b>G.I. 11</b>	4.5	0.7	1	5
<b>G.I. 12</b>	4.4	0.7	1	5
<b>G.I. 13</b>	4.4	0.8	1	5
<b>CSP 1</b>	3.9	1.1	1	5
<b>CSP 2</b>	4.5	0.7	1	5
<b>CSP 3</b>	4	1.1	3	4
<b>CSP 4</b>	4.2	0.9	1	5

<b>CSP 5</b>	4	1	1	5
<b>CSP 6</b>	3.8	1	1	5
<b>CSP 7</b>	4	0.9	1	5
<b>CSP 8</b>	3.7	1	3	4
<b>CSP 9</b>	4.1	0.8	2	4
<b>CSP 10</b>	4.1	0.9	1	5
<b>EO1</b>	4.4	0.7	1	5
<b>EO2</b>	4.3	0.7	1	4
<b>EO3</b>	4.3	0.8	1	5
<b>EO4</b>	4.3	0.7	2	4
<b>EO5</b>	4.2	0.8	1	5
<b>EO6</b>	4.1	0.9	2	5
<b>EO7</b>	4.2	0.7	1	5
<b>EO8</b>	4.3	0.8	1	4
<b>EO9</b>	4.3	0.7	1	5
<b>EO10</b>	4.2	0.8	1	5

### Measurement Model Analysis:

The relationship between the measurement items and the construct was investigated using the measurement model analysis, which consists of validity and reliability tests. SPSS-AMOS was utilized for testing direct and indirect effects simultaneously. This step also included the performance of convergent and discriminant validity for the constructs, as well as item and concept reliability. Table 3 presents the findings from the second iteration, which indicate that all

measurement items have significant loading values greater than 0.60. The findings demonstrated that all constructs were trustworthy since the composite reliability (C.R.) coefficients for each construct were greater than 0.70. Convergent and discriminant validity tests were employed in this study to evaluate the validity of the constructs. The convergent validity was tested using the AVE (Average Variance Extracted), as recommended by Fornell & Larcker (1981). To guarantee that measurement error does not predominate variance, the AVE value needs to be higher than 0.50. In order to determine whether a construct shared more variance with its measures than other constructs, the discriminant validity test was used. As a result, a comparison was made between the correlation between constructs and AVE square roots. The comparison's findings must demonstrate that a construct's AVE square root is higher than the correlation and another construct in order for the discriminant validity test to be passed. Table 4 results demonstrate that discriminant validity was met. This led to the conclusion that the measurement model satisfies the criteria for validity and reliability. As a result, the structural model analysis stage, which comes next, can be completed.

**Table 3 F.L., C.R., & AVE**

<b>Items</b>	<b>F.L.</b>	<b>CR</b>	<b>AVE</b>	<b>β</b>
G.I. 1	0.72	0.948	0.648	0.78
GI 2	0.82			
GI 3	0.81			
GI 4	0.85			
GI 5	0.85			
GI 6	0.65			

GI 7	0.78			
GI 8	0.86			
GI 9	0.87			
GI 10	0.81			
GI 11	0.82			
GI 12	0.87			
GI 13	0.86			
CSP 1	0.758	0.955	0.661	0.83
CSP 2	0.776			
CSP 3	0.744			
CSP 4	0.824			
CSP 5	0.873			
CSP 6	0.864			
CSP 7	0.831			
CSP 8	0.846			
CSP 9	0.833			
CSP 10	0.818			
EO 1	0.784	0.909	0.557	0.85
EO 2	0.803			
EO 3	0.818			
EO 4	0.712			
EO 5	0.761			

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EO 6	0.702
EO 7	0.695
EO 8	0.683
EO 9	0.803
EO 10	0.818

**Table 4: Discriminant validity**

	<b>GI</b>	<b>CSP</b>	<b>EO</b>
<b>G.I.</b>	(0.705)		
<b>CSP</b>	0.662	(0.713)	
<b>EO</b>	0.678	0.619	(0.747)

\*Fornell & Larcker (1981)

### Structural Model Analysis

To test hypotheses, structural model analysis was employed. This model was used to determine the direct effect of green innovation on business performance or the direct relationship between G.I. and E.O. A Hair et al. (2021) approach was used in performing structural model analysis. First, this research examined whether green innovation directly affects CSP. However, results indicated  $\beta = 0.67^{***}$ . The second hypothesis investigated green innovation's direct association with E.O., and this relationship indicated  $\beta = 0.70^{***}$ . Third, the hypothesis proved the indirect relationship between G.I. and CSP remains significant after adding E.O. ( $\beta = 0.33^{***}$ , significant). Thus, the results have accepted that E.O. mediates the impact of G.I. on sustainable business performance.

### Table 5 Hypothesis Results

Hypothesis	Coefficient	Result
G.I. – CSP	0.67 ***	Supported
G.I. – EO	0.70 ***	Supported
<b>Mediating Relationship</b>		
G.I. – E.O. - CSP	0.33 ***	Partial mediation

## Discussion

The findings underscore the association between G.I., entrepreneurial orientation and E.O. Moreover, exploring G.I. influence CSP and mediating E.O., considering organizational learning theory, suggested that G.I. can stimulate innovation, leading to higher economic growth and competitive advantage ([Zhang & Zhu, 2019](#)). The findings underscore the significant roles that green innovation (G.I.) and entrepreneurial orientation (E.O.) play in enhancing CSP in the manufacturing sector. The results support the hypothesis that G.I. positively influences CSP directly, consistent with the study (Wasiq et al., 2023) and indirectly through E.O., confirming the theoretical assertions presented in the literature review. Second, the study reveals that E.O. significantly mediates the relationship between G.I. and CSP also consistent with the study ([Khan et al., 2023](#)). This finding suggests that firms with a strong entrepreneurial orientation are more capable of leveraging green innovations to enhance sustainability performance. E.O., characterized by creativity, proactivity, and risk-taking, fosters an environment conducive to the successful implementation of green innovations. This supports the notion that entrepreneurial activities, such as exploring new market opportunities and collaborating with stakeholders, are crucial for translating green innovation into tangible sustainability outcomes (Jirakraisiri et al., 2021).

Moreover, the study concludes that E.O. implementation of G.I. will spur CSP. The study further concludes that both SSCM and GRPI lead to significant improvement in SMEs' sustainability performance. Finally, this research provides practical and theoretical implications.

### **Theoretical implications**

The theoretical implications of this study provide significant contributions to the existing literature on green innovation, entrepreneurial orientation, and corporate sustainability performance. Firstly, this research extends the organizational learning theory by integrating green innovation behaviours into the framework, demonstrating that both exploratory and exploitative learning are critical for achieving sustainable corporate performance. By highlighting the importance of green innovation in organizational learning, this study underscores the necessity for firms to adopt innovative environmental practices to remain competitive in a rapidly changing market. Secondly, this study emphasizes green innovation's role as a valuable and rare resource that can provide firms with a sustainable competitive advantage. The findings indicate that green innovation is not only a response to external environmental pressures but also a strategic asset that enhances firm performance. This aligns with the RBV theory's assertion that unique resources and capabilities are essential for sustaining competitive advantage. Thirdly, the research sheds light on the mediating role of entrepreneurial orientation in the relationship between green innovation and corporate sustainability performance. By incorporating entrepreneurial orientation, characterized by creativity, proactivity, and risk-taking, into the research model, this study reveals that firms with a strong entrepreneurial orientation are better equipped to leverage green innovations for improved sustainability outcomes. This finding bridges the gap between innovation and entrepreneurship



literature, suggesting that entrepreneurial activities are crucial for translating green innovation into tangible sustainability benefits.

Additionally, the study introduces a moderated mediation model that examines how entrepreneurial orientation influences the indirect effects of green innovation on sustainability performance. This nuanced perspective provides a deeper understanding of the mechanisms through which green innovation impacts corporate sustainability, highlighting the interplay between innovation, entrepreneurship, and sustainability. Finally, this research underscores the need for further empirical studies to explore the complex relationships between green innovation, entrepreneurial orientation, and corporate sustainability performance. By identifying the gaps in the existing literature and proposing new theoretical frameworks, this study paves the way for future research to delve deeper into the dynamics of sustainable corporate practices, ultimately contributing to the theoretical development and practical application in the field of green innovation and sustainability.

### **Practical implications**

The practical implications of this study offer valuable insights for managers and policymakers seeking to enhance corporate sustainability performance through green innovation and entrepreneurial orientation. Firstly, findings suggest that firms should prioritize adoption and green innovation practices implementation to achieve CSP. Managers should invest in environmentally friendly technologies, products, and processes that minimize resource consumption and reduce waste and pollution. So, firms are able to meet regulatory requirements as well as consumer sustainability demands, ultimately gaining a competitive edge. Secondly, enhances strong organizational and entrepreneurial orientation that maximizes green innovation benefits. Managers should encourage creativity, proactivity, and risk-taking among employees to

drive innovative solutions to environmental challenges. This can be achieved through training programs, workshops, and incentives that promote entrepreneurial thinking and behaviours.

By creating a culture that supports innovation and entrepreneurship, firms can more effectively leverage green innovations to enhance their sustainability performance. Thirdly, the study highlights the importance of aligning green innovation initiatives with the firm's overall strategic goals. Managers should ensure that green innovation is integrated into the corporate strategy, with clear objectives and performance metrics to track progress. This alignment will help firms to address environmental issues while achieving long-term business goals systematically. Additionally, collaboration with external stakeholders, such as suppliers, customers, and regulatory bodies, is crucial for the successful implementation of green innovations. Managers should build strong networks and partnerships to share knowledge, resources, and best practices in sustainability. This collaborative approach can lead to more effective and innovative solutions to environmental challenges.

Moreover, policymakers can draw on the findings to design supportive frameworks and incentives that encourage firms to adopt green innovation and entrepreneurial orientation. By providing grants, subsidies, and tax incentives for green projects, policymakers can stimulate investment in sustainable practices and technologies. Overall, the practical implications of this study emphasize the need for a comprehensive approach to green innovation, entrepreneurial orientation, and corporate sustainability performance. By fostering a culture of innovation and entrepreneurship, aligning green initiatives with strategic goals, and collaborating with external stakeholders, firms can achieve significant improvements in sustainability and long-term competitiveness.

### **Limitation and future direction**

This study presents several limitations that warrant consideration and pave the way for future research directions. Firstly, the sample specificity poses a limitation as the research was conducted exclusively within the manufacturing sector in Pakistan. This sector-specific and region-specific focus may need to be revised in order for the generalizability of the findings to other industries or geographical areas. The unique socio-economic and regulatory context of Pakistan could influence the observed relationships between green innovation, entrepreneurial orientation, and corporate sustainability performance. Future research should expand the scope to include diverse industries and regions, facilitating comparative studies that could uncover sector-specific or regional variations and enhance their applicability. Secondly, the cross-sectional design of this study captures data at a single point in time, limiting the ability to understand changes over time or establish causality. Longitudinal studies are recommended to provide insights into the dynamic nature of these relationships and to determine how green innovation and entrepreneurial orientation evolve and impact sustainability performance over the long term. Additionally, the reliance on self-reported data through self-administered questionnaires introduces potential bias, as respondents may be influenced by social desirability or personal perceptions. Incorporating objective measures or third-party evaluations in future research could help validate the findings and mitigate such biases. The study's focus on green innovation and entrepreneurial orientation, while valuable, overlooks other influential factors such as corporate culture, leadership style, and external environmental pressures. Including these variables in future research could offer a more comprehensive understanding of the determinants of corporate sustainability performance.

Furthermore, the exclusion of two items from the entrepreneurial orientation scale due to low factor loadings may affect the thorough assessment of this construct. Refining measurement instruments to ensure all relevant dimensions are accurately captured is essential for future studies. To enhance the robustness of future research, expanding the geographic and industry scope is crucial. Investigating these relationships across various sectors and regions can reveal unique insights and broaden the applicability of the findings. Employing longitudinal designs will help uncover causal relationships and the sustained effects of green innovation and entrepreneurial orientation on sustainability performance. Incorporating a broader range of variables, such as corporate culture, leadership, and market conditions, will provide a more holistic understanding. Lastly, future research should consider the role of government policies and regulations in promoting green innovation and entrepreneurial orientation. Understanding the interaction between policy frameworks and corporate practices can inform the development of more effective strategies for achieving sustainability goals. Addressing these limitations and exploring these future directions will contribute to a more comprehensive and nuanced understanding of the complex relationships between green innovation, entrepreneurial orientation, and corporate sustainability performance.

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