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Ambidexterity in Green Innovation: Organisational Consequences of Exploration and Exploitation Strategies

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Abstract Global warming and climate change are driving organisations to pursue green innovation efforts, which aim to reduce environmental impact and achieve sustainability goals. However, green innovations can be costly and difficult for organisations to implement in the short term. This study explores the concept of green organisational ambidexterity, defined as the simultaneous pursuit of exploration and exploitation strategies in green innovation activities. Organisations can create novel and innovative green products and processes as well as improve existing green products and processes by combining exploration and exploitation strategies. This situation provides organisations to compete more strategically in the long and short term while also being more environmentally friendly. The purpose of this study is to reveal the theoretical and conceptual framework of the concept of green organisational ambidexterity by reviewing the research conducted within the scope of the literature review and addressing its effects on organisations and sectors. In this regard, proposals are made to advance the body of literature addressing the concepts of green psychological capital, digital-technology adaptation, green strategic leadership and green strategic tension. The findings are intended to serve as a guideline for future research.

Keywords Green Innovation · Exploration Strategy · Exploitation Strategy · Green Organisational Ambidexterity · Sustainability · Organisational Performance

Jel Classification M10, M19

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The industrial revolution marked a turning point in how societies produced, consumed, and competed. With the invention of the steam engine and the gradual replacement of human labour by machines, economies began transforming at an unprecedented pace (Bruland & Smith, 2013). As technological progress continued to accelerate, especially in the 20th and 21st centuries, competition among firms intensified, often at the cost of environmental degradation and unsustainable resource use (Hart, 1995; Laperche, Lefebvre, & Langlet, 2011).

These challenges have placed growing pressure on organisations to rethink innovation strategies from an environmental perspective. Green innovation, once viewed as a cost or constraint, is now increasingly seen as a means of achieving long-term viability and fulfilling societal expectations (Chang & Chen, 2013; Zhang, Sun, Yang, & Wang, 2020). While the adoption of such strategies may carry short-term costs, the evidence suggests that, over time, they contribute meaningfully to both ecological and organisational outcomes (Hart & Dowell, 2011; Ma, Ali, Shahzad, & Khan, 2025; Mulaessa & Lin, 2021).

However, implementing green innovation is not a straightforward task. Organisations must often pursue two seemingly contradictory goals: developing novel, sustainable solutions and exploration strategies, while also refining existing practices for efficiency and exploitation strategies (March, 1991). The successful integration of these two different strategies is crucial for maintaining the balance between an organisations internal and external environments (Wang, Xue, Sun, & Yang, 2020). The ability to manage both has come to be understood through the perspective of organisational ambidexterity—a concept that has gained traction in recent decades (O'Reilly & Tushman, 2008; Raisch, Birkinshaw, Probst, & Tushman, 2009).

When applied to sustainability contexts, this dual capability has been conceptualised as Green Organisational Ambidexterity (GOA), an emerging framework for understanding how organisations navigate the complex terrain of innovation, performance, and responsibility (Martínez-Falcó, Sánchez-García, Marco-Lajara, & Visser, 2024). This concept allows organisations to be more environmentally friendly while also improving organisational performance (Sun & Sun, 2021).

This study aims to shed light on how the dual implementation of green exploration and exploitation strategies under the framework of GOA leads to distinct organisational, environmental, technological and psychological outcomes, and what internal capacities are needed to support this balance in practice. The findings of the GOA literature are presented in a systematic manner, as are the proposals for new studies. In particular, it is proposed that the relationship between GOA and green strategic tension should be addressed and supported by technological, environmental, organisational, and psychological factors.

Literature Review

Green Innovation

It is stated that green innovation has a significant impact on organisations' ability to perform their environmental activities in a sustainable manner (Takalo & Tooranloo, 2021). In reviewing the literature, it is evident that green innovation is widely defined by scholars as the development and implementation of innovations focused on reducing environmental impact and enhancing environmental sustainability

(Aguilera-Caracuel & Ortiz-de-Mandojana, 2013; Chen, 2008; Schiederig, Tietze, & Herstatt, 2012; Shahbaz, Ahmad, & Malik, 2024; Takalo & Tooranloo, 2021). Green innovation is recognised as critical for organisations to meet strict environmental legislation and social expectations, improve their corporate image, increase productivity, and achieve long-term competitive advantage (Chang, 2011; Ma et al., 2025). It is emphasised that in order to capitalise on this advantage, organisations must constantly revise their strategies by incorporating their talent and knowledge into green innovation activities (Zhang et al., 2020). It has been discovered that organisations that continually improve their strategies with the development of novel, environmentally friendly technologies and knowledge seek to provide a long-term competitive advantage by effectively incorporating these elements into all of their activities (Tu & Wu, 2021).

It is posited that for organisations aiming to achieve their strategic goals while fulfilling social responsibilities, green innovation serves as a critical challenge and a strategic opportunity (Zhang et al., 2020). While some scholars posit that green innovation initiatives are costly for organisations, others argue that they confer a sustainable competitive advantage (Hart, 1995; Su et al., 2020). The aim of green innovations is to enhance organisational efficiency by strategically integrating knowledge, technology, and innovation as key drivers of development (Tu & Wu, 2021). Growing social awareness drives increased demand for environmentally friendly products (Chen & Chang, 2013). To remain competitive, organisations may be compelled to develop green products and services. However, to effectively execute these initiatives, they must embed environmental awareness in their organisational structures (Chen, 2010). Beyond this integration, creativity is widely recognised as one of the most critical elements for organisations in conducting product development activities (Chen & Chang, 2013).

Organisations under environmental pressures are increasingly incorporating environmental considerations into their strategic planning. While research indicates that green innovations may initially yield lower profits compared to traditional innovations due to significant regulatory compliance costs, their long-term benefits for productivity typically outweigh these costs (Aldieri, Kotsemir, & Vinci, 2021). However, achieving this balance may be more challenging for small- and medium-sized enterprises than for larger organisations.

Evidence suggests that to mitigate risks and costs while maximising benefits across short, medium, and long terms, organisations are increasingly adopting an ambidextrous approach to green innovations (Chen, Gao, & Zhang, 2022; Sun & Sun, 2021). Organisational ambidexterity is recognised as a crucial factor in advancing sustainable development alongside green innovation (Hafeez, Yasin, Zawawi, Odilova, & Bataineh, 2024). Integrating green innovations with organisational ambidexterity, within a framework that benefits the environment, society, and economy is argued to enhance an organisation's sustainable competitive advantage (Shehzad, Zhang, Latif, Jamil, & Waseel, 2023).

Organisational Ambidexterity

In today's competitive landscape, characterised by rapid technological advancements and globalisation, organisations are increasingly seeking long-term competitive advantages by integrating exploration and exploitation strategies. Organisational ambidexterity, defined as the ability to simultaneously manage these distinct strategies, is essential for achieving both immediate success and sustained survival (Gibson & Birkinshaw, 2004). Organisational ambidexterity is based on the balanced implementation of these two different strategies (Junni, Sarala, Taras, & Tarba, 2013). Organisational ambidexterity becomes even more crucial when implementing these different strategies simultaneously due to the limited and uncertain characteristics of an organisation's internal and external resources (Cao, Gedajlovic, & Zhang, 2009). To secure

a sustainable competitive edge, organisations must effectively implement a range of innovation activities within the frameworks of exploration and exploitation strategies (Clauss et al., 2021; March, 1991).

Exploration strategies focus on implementing novel activities through disruptive innovation, aiming to introduce new approaches rather than relying on existing methods. In contrast, exploitation strategies emphasise cost reduction and incremental improvements by optimising current resources (Jurksiene & Pundziene, 2016; March, 1991). Research indicates that organisations seeking to mitigate risk and achieve short-term objectives are more likely to employ exploitation strategies, while those aiming to integrate more effective and rational approaches for long-term success are inclined towards exploration strategies (Clauss et al., 2021; Lubatkin, Simsek, Ling, & Veiga, 2006).

Organisational ambidexterity, which allows firms to concurrently employ exploration and exploitation strategies, has been shown to facilitate the attainment of a sustainable competitive advantage by leveraging both innovative and refined technologies and markets (Mom, Chang, Cholakova, & Jansen, 2019; O'Reilly & Tushman, 2013; Raisch & Birkinshaw, 2008). However, effectively managing these divergent strategies simultaneously poses significant challenges. The need to adapt to emerging opportunities in the middle of environmental changes can lead to structural inertia, potentially hindering an organisation's ability to respond to new developments. Furthermore, focusing on future environmental shifts may disrupt ongoing activities, creating tensions between immediate operational demands and long-term strategic goals (Clauss et al., 2021; He & Wong, 2004; March, 1991).

In today's competitive landscape, organisations must simultaneously pursue exploration strategies that emphasise risk-taking and creativity, alongside exploitation strategies focused on enhancing efficiency and facilitating continuous improvements (Kassotaki, 2022; March, 1991). The role of an ambidextrous organisational structure is crucial for effectively analysing and interpreting customer demands, technological advancements, and competitive dynamics. It is also essential for organisations to continuously reassess their activities by evaluating opportunities and threats in the context of their strengths and weaknesses (Carmeli & Halevi, 2009; O'Reilly & Tushman, 2011).

Existing literature highlights a positive relationship between organisational ambidexterity and organisational performance (Kassotaki, 2022; Mura, Micheli, & Longo, 2021; Stubner, Blarr, Brands, & Wulf, 2012). Research indicates that a high level of integration between exploration and exploitation strategies significantly enhances organisational performance (Junni et al., 2013; Severgnini, Vieira, & Cardoza Galdamez, 2018). Dynamic capabilities are identified as crucial for achieving organisational ambidexterity and sustaining a competitive advantage (Weiss & Kanbach, 2022). The significance of dynamic capabilities increases as the external environment becomes more complex and the number of factors influencing interactions among actors rises (Chakma, Paul, & Dhir, 2021).

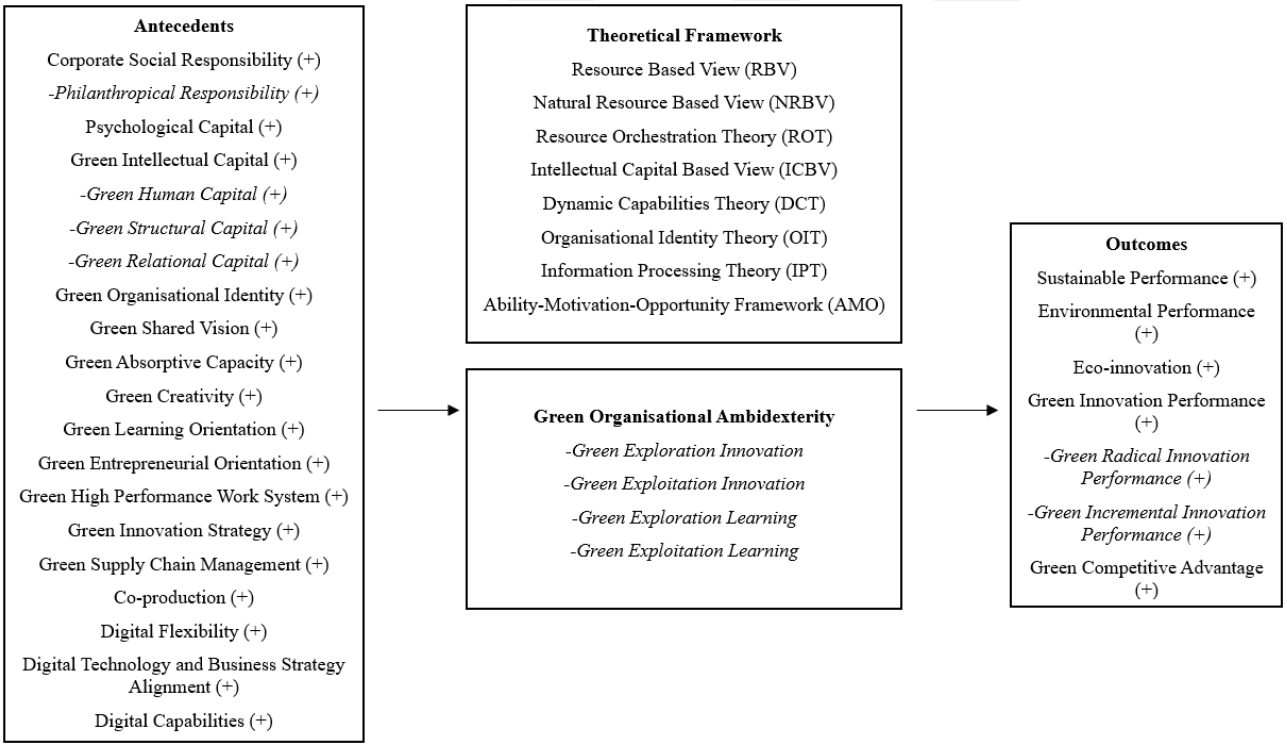
Green Organisational Ambidexterity: A Theoretical and Conceptual Framework for Exploration and Exploitation Strategies

This section of the study aims to investigate GOA within a theoretical and conceptual framework using a literature review. The literature review reveals the relationship between GOA and other concepts, as well as the theoretical framework underpinning this relationship. This study investigates the relationships among various concepts and theories related to GOA, as illustrated in Figure 1. This integrative framework not only offers a conceptual map of GOA's theoretical foundation but also establishes a coherent structure to understand how firms balance strategic duality for environmental and competitive advantages.

Increasing competition reveals the need for firms to combine different strategies to achieve a sustainable competitive advantage. Because while firms that focus solely on exploration strategies prioritise long-term profits, internal risks are unavoidable in the short term (Hafeez et al., 2024). Within the framework of organisational ambidexterity, businesses engage in activities to implement these strategies to ensure their survival, while also striving to make their activities more environmentally friendly to increase environmental sustainability. Green innovation activities are categorised into green exploration and exploitation innovations within the framework of organisational ambidexterity (Sun & Sun, 2021). Asiaei, O'Connor, Barani, and Joshi (2023) propose that firms might include the GOA strategy in the framework of exploration and exploitation green innovations to improve their environmental performance and sustainable competitive advantage. The concept of GOA plays a crucial role in enhancing organisational sustainability by integrating both exploration and exploitation strategies with green innovation activities (Martínez-Falcó et al., 2024). Exploitation green innovations focus on leveraging existing environmental knowledge, skills, and processes to enhance current green products, processes, and strategies. In contrast, exploration green innovations aim to utilise environmental knowledge, skills, and processes to create new green products, processes, and strategies (Chen, Chang, & Lin, 2014; Lu, Li, & Yuen, 2023). To further elucidate the foundations of GOA, it is essential to consider the role of internal organisational resources and their strategic deployment, which is best captured through the resource-based view (RBV).

Figure 1

Concepts and Theories Related with Green Organisational Ambidexterity



Resource-Based View Framework: To achieve a sustainable competitive advantage, organisations must possess resources that are valuable, rare, inimitable, and non-substitutable (Barney, 1991). RBV states that organisations generate value and gain a competitive edge through the effective management of these resources (Sirmon, Hitt, & Ireland, 2007). GOA refers to the strategic use of an organisation's resources

and capabilities to create sustainable value by integrating both exploration and exploitation strategies (Alauddin, 2023).

Organisations can amplify their green innovation efforts by allocating resources to corporate social responsibility (CSR) activities (Guo, Wang, & Yang, 2020). CSR focuses on firm activities that benefit society and contribute to economic development while adhering to ethical principles (Moir, 2001). Within the framework of RBV, CSR activities enable firms to gain a sustainable competitive advantage by increasing green exploration and exploitation innovation (Alauddin, 2023). However, the literature reveals that while GOA is significantly positively related to the philanthropic dimension of CSR, no significant relationship is found with the economic, legal, and ethical dimensions (Khan, Chen, & Hung, 2021).

Green learning orientation is an important component in firms' acquisition of green knowledge and its application in their operations (Rehman, Ahmad, Belas, Battisti, & Santoro, 2024). Increasing green learning boosts firms' green innovation and environmental performance (Shafait & Huang, 2024). Within the framework of RBV, green learning has a positive effect on both green exploration and green exploitation strategies, yet the effect is stronger on green exploration strategies (Wang, Xue, Sun, et al., 2020). Building upon the RBV, the natural resource-based view (NRBV) extends the scope of resource valuation to include environmental considerations, offering a more ecologically grounded perspective to understand GOA.

Natural Resource-Based View Framework: NRBV, a subset of the RBV, offers a valuable framework for understanding how organisations leverage environmental resources in their exploration and exploitation innovation strategies (Rehman, Kraus, Shah, Khanin, & Mahto, 2021). Research indicates that organisations employing organisational ambidexterity within the NRBV framework enhance their sustainability by prioritising environmental management and green innovation strategies (Baquero, 2024). Within the framework of this theory, it is observed that firms make the most effective use of their resources and improve their sustainable performance by focusing on environmental activities (Martínez-Falcó et al., 2024).

Within the framework of NRBV, green organisational identity helps firms achieve a sustainable competitive advantage by directing them to engage in environmentally friendly practices (Chen, 2011). It has been observed that as firms green organisational identities increase, so do their GOA activities and long-term competitive advantages (Chen et al., 2022). Furthermore, green creativity has a significant impact on the implementation of green innovation initiatives. Green creativity refers to firms that conduct their creative activities in a way that considers environmental factors (Ma et al., 2025). According to the NRBV framework, green creativity has a positive impact on the development of green exploration and green exploitation innovation strategies, helping firms in developing more environmentally friendly activities (Alauddin, 2023). While RBV and NRBV identify critical resources, resource orchestration theory (ROT) sheds light on the mechanisms by which these resources are structured and leverage an essential dynamic in the effective implementation of GOA.

Resource Orchestration Theory Framework: ROT, derived from the RBV, is used to address organisations' capabilities to effectively implement different strategies to create value, as well as the resources needed to develop these capabilities (Shehzad et al., 2023; Sirmon, Hitt, Ireland, & Gilbert, 2011). It is clear that organisations' ability to organise, combine, and use their resources plays a key role in the successful implementation of green innovations (Wang, Xue, & Yang, 2020). The significance of the idea of natural resource orchestration is underlined within the framework of ROT by mentioning the value of green resources and organisational capabilities (Asiaei et al., 2023). It is maintained that an organisation's ability to integrate

all of its resources and skills and use them effectively has a dynamic effect on the realisation of green innovations (Shehzad et al., 2023).

Green entrepreneurial orientation refers to implementing green activities in a way that generates both environmental and economic benefits by capitalising on emerging opportunities (Jiang, Chai, Shao, & Feng, 2018). It is emphasised that the high tendency towards green entrepreneurship in firms promotes green innovation while also providing an opportunity for environmental awareness in organisations (Shehzad et al., 2023). Within the framework of NRBV and ROT, research shows that firms with a strong inclination towards green entrepreneurship that concentrate their entrepreneurial abilities on environmentally sustainable innovations are more likely to adopt these innovations, which lowers their carbon footprint and gives them a sustainable competitive advantage (Baquero, 2024). Both green exploration and exploitation strategies seem to benefit from a green entrepreneurship orientation (Shehzad et al., 2023). However, the research shows that the mediating effect of green exploitation strategies has a positive and significant effect on the relationship between green entrepreneurship orientation and green performance, whereas the mediating effect of green exploration strategies has no significant effect (Baquero, 2024). In addition to the ROT emphasis on dynamic impact, the intellectual capital-based view (ICBV) emphasises the importance of both dynamic impact and intellectual capital on the GOA.

Intellectual Capital Based View: Regarded as another component of the RBV, ICBV highlights the significance of individuals acquiring distinctive skills to help organisations attain a sustainable competitive edge in the context of intangible assets such as human, structural, and customer capital (Reed, Lubatkin, & Srinivasan, 2006). Within the framework of ICBV, firms that develop green intellectual capital exhibit improved green innovation performance (Marco-Lajara, Zaragoza-Sáez, Martínez-Falcó, & Sánchez-García, 2023).

It is discovered that green supply chain management and green human capital boost a firm's capacity for GOA, and that there is a positive relationship between sustainable performance and GOA within the frameworks of the ICBV and the NRBV (Martínez-Falcó et al., 2024). It has been noted that modern environmental technologies and strategies, along with an emphasis on green structural capital within the organisation, help firms implement both green exploration and exploitation strategies more successfully (Asiaei et al., 2023). Complementing ROT and ICBV, the dynamic capabilities theory (DCT) introduces the adaptive capacity of firms to reconfigure resources in response to environmental turbulence, which is central to sustaining GOA over time.

Dynamic Capabilities Theory Framework: Organisations may require qualified employees to manage their current resources effectively and integrate new resources successfully to improve performance (Mackey, Barney, & Dotson, 2017). To develop a sustainable competitive advantage, DCT addresses the efficient use of accumulated resources and capabilities as well as the acquisition of new ones (Teece, Pisano, & Shuen, 1997). It is evident that having employees who can recognise environmental issues and improve organisational performance is crucial within the context of dynamic capabilities (Úbeda-García, Marco-Lajara, Zaragoza-Sáez, Manresa-Marhuenda, & Poveda-Pareja, 2022).

Organisations have started to plan their employees' training so that it is both occupational and technologically focused, while also raising environmental awareness as GOA gains interest (Cainelli, De Marchi, & Grandinetti, 2015). It is underlined that an organisation's dynamic capabilities are crucial to the effective utilisation of its current competencies as well as the acquisition of new ones. Within the DCV framework, firms' GOA increases co-production levels and green innovations (Chang & Gotcher, 2020). As a result, firms with ambidexterity have an advantage over their competitors because they can operate in different strate-

gies simultaneously (Junni et al., 2013; O'Reilly & Tushman, 2008). Beyond structural and strategic aspects, the organisational self-concept, addressed by organisational identity theory (OIT), provides insights into how shared values and identity strengthen commitment to green ambidextrous strategies.

Organisational Identity Theory Framework: OIT investigates the effects on employees' behaviour within the organisation (Albert, Ashforth, & Dutton, 2000). It is stated that organisational identity elevates employee self-concept to an organisational level, assisting similar values from spreading throughout the organisation (Hatch & Schultz, 2002).

OIT reveals that employees' adoption of organisational values, personal growth, and improved performance are all linked to the successful implementation of innovations (Chen et al., 2022). It has been observed that as firms green organisational identities increase, so does their green innovation (Chang & Chen, 2013; Song & Yu, 2018). While green organisational identity awareness in firms has a positive impact on GOA activities, it also increases green competitive advantage (Chen et al., 2022). By combining the development of their organisational identities with exploration and exploitation strategies, employees in organisations that embrace GOA will contribute to sustainable development. In parallel with internal identity structures, effective information processing is another vital organisational function. Information processing theory (IPT) thus offers a perspective to evaluate how firms handle environmental complexity while pursuing GOA.

Information Processing Theory Framework: Information is a key component of dynamic organisational structures (Jarvenpaa & Ives, 1994). The framework of IPT reveals that information processing is critical for organisations to improve their performance and maintain their sustainability despite environmental uncertainty (Dubey et al., 2021; Egelhoff, 1991).

Digital transformation is an important component in enhancing green innovation activities because it allows firms to increase their investments while decreasing their costs (Liu, Liu, & Ren, 2023). In the context of IPT, firms' digital flexibility, digital technology and business strategy alignment, and digital capabilities are observed to enhance their green exploration and green exploitation innovations in the context of information processing (Lu et al., 2023). According to the findings, digital transformation is considered a key factor in increasing GOA. Given the central role of human capital in enabling GOA, the ability-motivation-opportunity (AMO) framework offers a human resource-oriented perspective to explain how employee centred mechanisms influence green strategic implementation.

Ability-Motivation-Opportunity Framework: The AMO framework for assessing the impact of human resources on firm performance emphasises the importance of employees' abilities, motivations, and opportunities in reducing environmental damage while increasing firm productivity (Renwick, Redman, & Maguire, 2013). This theory, which is widely used in green human resource management, illustrates the impact of employees on green innovation activities (Ma & Wang, 2024).

Within the framework of AMO, it is observed that there is a positive relationship between the green high-performance work system and GOA, as well as between GOA and environmental performance, but the mediating effect of GOA in the relationship between the green high-performance work system and environmental performance is not significant (Úbeda-García et al., 2022).

Overall, within the framework of GOA, it is discovered that green shared vision and green absorptive capacity have a positive relationship with both green exploration and green exploitation strategies, as well as a positive relationship between green exploitation strategies with green incremental innovation performance and green exploration strategies with green radical innovation performance (Chen et al., 2014).

Green shared vision refers to the collective internalisation of environmental goals by the firms' stakeholders, whereas green absorptive capacity refers to the assimilation and application of information required for the firm to achieve its environmental objectives (Chen, Chang, Yeh, & Cheng, 2015; Pacheco, Alves, & Liboni, 2018). Viewed as a critical component in enhancing GOA, senior managers in organisations have a significant role to play in creating a green shared vision and green absorptive capacity (Chen et al., 2014). It is concluded that GOA skills are positively affected by the organisation's development of this cognitive structure towards environmental awareness (Chang, Chen, Luan, & Chen, 2019). In addition, it is unsurprising that there is a relation between green exploration strategy and green radical innovation performance as firms make radical changes in their activities, and between green exploitation strategy and green incremental innovation performance as firms make minor changes. Furthermore, in terms of psychological factors, GOA and psychological capital have a positive relationship (Tang, Chen, Shao, & Cao, 2022). This concept, which is related to positive psychological characteristics such as self-efficacy, optimism, hope, and resilience, plays an important role in the impact of individuals on firm performance (Newman, Ucbasaran, Zhu, & Hirst, 2014; Peterson, Luthans, Avolio, Walumbwa, & Zhang, 2011). While psychological capital improves employees' ability to implement green innovation, it also provides firms with environmental and social benefits in addition to financial returns (Peng et al., 2024).

It is concluded that firms employ both green exploration and exploitation strategies to make their products, processes, and strategies more environmentally friendly, socially acceptable, and economically viable. It has been discovered that green exploration and green exploitation innovation activities of firms have a positive and significant impact on their sustainability performance (Lu et al., 2023). It is claimed that GOA positively influences green innovation activities (Chang & Gotcher, 2020). Within the context of green innovation management, it is emphasised that firms should divide green innovation activities into exploration and exploitation categories and use them concurrently to achieve success in both short- and long-term objectives (Sun & Sun, 2021). Thus, it is anticipated that the disadvantages that firms implementing green innovations will face in the short and medium term will be mitigated.

Synthesising the theoretical perspectives discussed above, a multilevel and interdisciplinary understanding of GOA emerges, offering a fertile ground for future research and managerial practice. Taken together, this study offers a comprehensive synthesis of the theoretical foundations surrounding GOA. By systematically integrating insights from the RBV, NRBV, ROT, DCT and complementary frameworks such as OIT, IPT and AMO, it positions GOA as a unifying conceptual perspective through which firms' dual pursuit of environmental sustainability and innovation performance can be understood. While previous studies have typically treated these theories in isolation, this study demonstrates how they intersect and collectively inform our understanding of how exploration and exploitation strategies are deployed in green innovation contexts. In doing so, the research moves beyond fragmented discussions and contributes to the literature by offering a structured, multi-theoretical framework that highlights the complex interplay between organisational capacities, strategic alignment, and sustainable value creation. This synthesis not only clarifies existing conceptual linkages but also lays the groundwork for future empirical studies aiming to operationalise GOA in diverse organisational settings.

GOA can be viewed as the strategic integration of green exploration and green exploitation innovation activities that interact with the environmental, technological, organisational, and psychological components of firms. Instead of implementing these two strategies separately, they are expected to improve their environmental sustainability and firm performance by combining these two separate strategies and employing

the concept of green strategic tension. In this context, it is expected that by applying the RBV, NRBV, ROT, and DCV theories, the importance of GOA as a multidimensional conceptual framework will be revealed from various perspectives, increasing firms' sustainable competitive advantage in a variety of organisational contexts.

Green Organisational Ambidexterity: An Organisational and Sectoral Consequences of Exploration and Exploitation Strategies

In this section, the literature analysis method will be used to examine the organisational and sectoral consequences of GOA. It has been observed that studies on GOA are conducted in various sectors and that they have relationships to different organisational concepts in different sectors.

Manufacturing Context: Within the scope of the research discussed, the majority of the work has been conducted in the manufacturing sector. Shehzad et al. (2023) investigated the relationship between GOA and green entrepreneurial orientation in manufacturing firms in Pakistan, whereas Baquero (2024) investigated manufacturing firms in the UAE. Both studies found a positive relationship between GOA and green entrepreneurial orientation. However, when we consider the studies as exploration and exploitation green innovations, which are GOA dimensions, we see a significant difference between the two studies. Although both types of innovation have a positive relationship, Shehzad et al. (2023) discovered that exploration green innovation has a stronger relationship, whereas Baquero (2024) discovered that exploitation green innovation does. Despite both studies focused on manufacturing firms, the differences in results are thought to be because manufacturing firms in different sectors were addressed, as well as differences in country dynamics.

When we examine other studies on manufacturing firms, Khan et al. (2021) investigated the relationship between GOA and the economic, legal, ethical, and philanthropic dimensions of the CSR concept, whereas Alauddin (2023) investigated the CSR concept as a whole. While Alauddin (2023) discovered a positive relationship between GOA and CSR in his study in Bangladesh, Khan et al. (2021) discovered that only the philanthropic responsibility dimension has a significant relationship with GOA in their study in Pakistan. The differences between the two studies cannot be determined because the Alauddin (2023) study did not address the dimensions of the CSR concept. In addition, Alauddin (2023) demonstrated in his study that there is a positive relationship between GOA and green creativity.

Wang, Xue, Sun, et al. (2020) showed that there is a positive relationship between GOA and green learning orientation in their study on manufacturing firms in China. Sun and Sun (2021) reveal that there is a positive relationship between GOA and green innovation strategy in their study on manufacturing firms in China. In their study of original equipment manufacturers (OEM) suppliers in Taiwan, Chang and Gotcher (2020) discovered a positive relationship between GOA and co-production as well as eco-innovation. Within the scope of various manufacturing firms, in their study, Chen et al. (2022) discovered a positive relationship between GOA and green organisational identity and green competitive advantage. GOA has been shown to have a positive effect on manufacturing firms in general. In their study of Taiwan's electronics industry, Chen et al. (2014) discovered a positive relationship between GOA and green shared vision, green absorptive capacity, and green innovation performance. Martínez-Falcó et al. (2024) found a positive relationship between GOA and sustainable performance, green human capital, and green supply chain management in Spanish wineries.

Despite some differences between studies in different countries addressing GOA, the findings appear to boost firm performance and sustainability. In particular, it is discovered that organisational factors have significant positive effects on GOA, and that increasing GOA has a positive effect on firms' environmental performance and sustainable competitive advantage.

Other Sectoral Context: Tang et al. (2022) found a positive relationship between GOA and psychological capital in their study of workers at green building businesses in China. It has been observed that firms with GOA not only improve their performance but also raise the intellectual level of those involved within the organisation and their commitment to the organisation. In the service sector, managers' high levels of creativity improve the effectiveness of firm activities and the speed with which emerging problems are resolved (Tang et al., 2022). As a result, it is believed that the high psychological capital of firm managers will make it easier for them to focus on environmental factors, carry out actions that will increase firm productivity while also performing environmental activities, and quickly solve problems that arise.

According to Úbeda-García et al. (2022) study on hotels in Spain, there is a positive relationship between GOA and green high-performance work system and environmental performance. The presence of a green organisational culture in hotels, which are in the service sector, increases green innovation activities, and green innovation improves economic performance (Gu, 2023). Green human resources are expected to have a positive impact on companies in this sector, both environmentally and economically, by increasing GOA.

In their study of maritime professionals in Singapore, Lu et al. (2023) discovered a positive relationship between GOA and digital flexibility, digital technology and business strategy alignment, digital capabilities, and sustainability performance. As digitalisation increases, so do investments in information technology in the maritime sector, as well as in other sectors (de la Peña Zarzuelo, Soeane, & Bermúdez, 2020). Within the context of technology's increasing importance, the positive effects on information processing in the maritime sector increase the GOA, which in turn increases firm sustainability performance.

Asiaei et al. (2023) discovered a positive relationship between GOA and green intellectual capital as well as environmental performance in the IT, banking, agriculture, and manufacturing sectors. Although green intellectual capital improves GOA and GOA environmental performance, examining different sectors prevents the results from being considered in a sectoral context.

Conclusion and Discussion

Within the framework of organisational and psychological consequences, the findings indicate that both organisational and psychological factors significantly enhance GOA. Notably, increasing green intellectual and psychological capital is essential, as it not only elevates personnel qualifications but also facilitates the effective implementation of green exploration and exploitation strategies. As competition intensifies, the demand for qualified personnel becomes critical, underscoring the vital role of managers in recruiting and training employees capable of successfully navigating these dual strategies.

Moreover, the importance of CSR initiatives has grown alongside societal awareness, further enhancing GOA. As firms focus more on CSR activities, they improve their corporate image while also making it easier to attract talented employees. It is believed that the inclusion of talented personnel in the firm will facilitate the implementation of GOA, and that the successful implementation of GOA will result in a sustainable competitive advantage by increasing both CSR activities and performance. As organisations cultivate a strong green identity and shared vision, employees' sense of belonging and responsibility increases, posi-

tively impacting GOA. Creativity also emerged as a vital component in developing innovations, with green creativity activities showing a notable influence on organisational outcomes.

The findings suggest that organisations engaging in green innovation-related entrepreneurial activities, framed within a green entrepreneurial orientation, experience increased GOA. Furthermore, the agility of green ambidextrous organisations is underscored, as their ability to adapt promptly to innovations and changes is crucial for sustainable practices.

In today's rapidly advancing digital landscape, organisations must adapt to new technologies while pursuing green innovations to enhance both performance and corporate image. Within the framework of technological consequences, the interplay between innovation, digitalisation, and GOA is significant; firms that develop digital capabilities and align their business strategies with digital technology are more likely to improve their GOA. It is believed that the active role of managers, the integration of digital technologies into business strategies, and the training and inclusion of personnel who will use these technologies will all help to facilitate the implementation of GOA strategies.

Within the framework of environmental consequences, GOA is seen to have a positive impact on firms' environmental performance and sustainability, either directly or through interactions with the concepts it is associated with. In addition to improving a firm's green innovation performance, it helps them gain a sustainable competitive advantage. Furthermore, firms that are able to manage the inherent tensions between exploration and exploitation, often referred to as "green strategic tension", demonstrate higher levels of adaptive capacity and long-term resilience. This balance enables firms to innovate responsibly while ensuring operational continuity, a key requirement for maintaining competitiveness in turbulent environments.

Although studies on GOA have been conducted in a variety of sectors, primarily in manufacturing firms, there is a positive relationship between firms with GOA and psychological, technological, organisational, and environmental factors. Firms adoption of GOA strategies is an important factor in achieving sustainable competitive advantage. However, it is expected that increasing the number of studies on GOA will allow for a more accurate determination of whether these firms tend to use exploitation or exploration strategies within the context of their structures, sectors, and countries. Although the findings for firms with GOA are important, the effects of exploration and exploitation strategies differ between studies conducted on firms in different sectors and countries.

Notably, the literature has yet to fully capture how GOA functions beyond manufacturing industries. Future research should investigate GOA's applicability across diverse organisational forms, particularly in services, public administration, and technology-intensive environments, where innovation and sustainability intersect in different ways.

GOA has become a focal point within the management and strategy literature, intersecting with concepts such as innovation strategies, CSR, and green intellectual capital. This intersection highlights the need for further exploration within the context of supply chain management and other domains. As the body of research on GOA expands, it is expected to have a substantial impact on both the literature and industry practices.

The strategic significance of GOA to firms is demonstrated by the fact that the studies often focus on the manager level. This level is considered the most appropriate sample for rationally measuring firms'

strategic activities, including both risk-taking by implementing exploration green innovations and the desire to increase effectiveness by implementing exploitation innovations.

Although implementing green innovations presents challenges in the short term, the study reveals that these obstacles can be overcome through effective GOA. Organisations that strategically balance exploration and exploitation are better positioned to reduce risks and enhance productivity, ultimately achieving a sustainable competitive advantage. Determining the optimal weighting of these strategies, considering organisational size and structure, will be beneficial for long-term sustainability. However, it is anticipated that a longitudinal study will yield more rational results for firms.

Within the context of environmental factors, environmental uncertainty and environmental knowledge are thought to have a significant impact on GOA by influencing firms' green activities. Furthermore, it is anticipated that addressing the relationship between GOA and waste management will make significant contributions to both the literature and the sector, particularly the manufacturing sector.

Within the framework of organisational factors, it is believed that increased knowledge sharing within the firm can have a significant impact on GOA by influencing both green exploration and green exploitation strategies. It is expected that firms will need to address the concepts of green strategic tension and green strategic leadership to effectively implement green exploration and exploitation strategies. Moreover, it is thought that it would be beneficial to address the concept of green human resource management so that firms can manage employees who can effectively implement these two distinct strategies simultaneously.

Within the framework of technological factors, it is anticipated that firm adoption of artificial intelligence and the expansion of technological capabilities will impact GOA. In addition to these factors, it is anticipated that innovative work behaviour and digital-technology adaptation developments will have a positive impact on GOA, significantly increasing firm performance and sustainability.

Within the framework of psychological factors, it is expected that employees will play an important role in the successful implementation of two different strategies, green exploration and green exploitation, with significant effects on psychological capital, psychological stress, and employee well-being. It is also expected that employees' high levels of motivation for green activities will have a positive impact on GOA.

Focusing on the concept of green strategic tension, we propose to create a model that integrates the concepts of green strategic leadership, digital-technology adaptation, and green psychological capital, as well as addressing organisational, technological, and psychological factors simultaneously. It is expected that investigating this model in various sectors, how firms can implement green exploration and exploitation strategies in an integrated manner, and the effects on environmental and sustainable performance, as well as environmental factors, will make significant contributions to the literature. In this framework, the key dimensions of the relationship between GOA and green strategic tension are addressed below:

- **Independent variable:** Green strategic leadership, digital-technology adaptation, and green psychological capital.
- **Dependent variables:** Sustainable performance, environmental performance, competitive advantage, and learning orientation.
- **Mediating variable:** Green strategic tension
- **Theories:** RBV, NRBV, ROT, and DCV

Green's strategic tension concept not only makes a theoretical contribution to the literature, but it is also expected to play a strategic role in shaping sector activities. While the relationship between strategy and sustainability is becoming increasingly important, the following proposals are thought to fill a significant gap in the literature regarding the relationship between GOA and green strategic tension.

Proposal 1: Green strategic tension has a positive relationship with GOA.

Proposal 2: Green strategic tension mediates the relationship between green strategic leadership and GOA.

Proposal 3: Green strategic tension mediates the relationship between digital-technology adaptation and GOA.

Proposal 4: Green strategic tension mediates the relationship between green psychological capital and GOA.

Thus, it is expected that GOA will evolve into an integrative tool that brings together previously discussed findings within the framework of theoretical perspectives, sectoral applications, and conceptual aspects. With this model based on green strategic tension, the dynamic balance between green exploration and green exploitation strategies is thoroughly addressed, and a novel perspective is proposed.

Table 1

Direction for Future Research

Contribution Area	Concept	Future Research Direction
Environmental	Environmental uncertainty Environmental knowledge Waste management	How does increase environmental uncertainty and knowledge in firms impact GOA? How do green exploration and exploitation strategies relate to waste management within the framework of GOA?
Organisational	Knowledge sharing Green strategic tension Green strategic leadership Green human resource management Firm productivity	Does increased knowledge sharing improve the effectiveness of GOA? What role do green strategic tension, green strategic leadership, and green human resource management play in the successful implementation of firms' green exploration and exploitation strategies within the context of GOA? What impact do firms' green exploration and exploitation strategies have on firm productivity within the context of GOA?
Technological	Artificial intelligence Innovative work behaviour Digital-technology adaption Technological capabilities	Do firms that use AI and increase their technological capabilities have a positive and significant impact on GOA? What effect do firms innovative work behaviour and digital-technology adaptation have on GOA?
Psychological	Psychological capital Psychological stress Employee well-being Green motivation	What are the roles of employee well-being, psychological capital, and psychological stress in achieving GOA? Does green motivation have a positive effect on green exploration and exploitation strategies within the GOA framework?

Furthermore, in this framework, Table 1 provides suggestions for future studies to fill the gaps in the literature. By addressing these gaps, studies can provide valuable insights for firms looking to strengthen their environmental initiatives and sustainability efforts. The findings from this research not only contribute to a deeper understanding of GOA but also offer a foundation for future inquiries into how green exploration and exploitation strategies can drive firm success.

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References

Aguilera-Caracuel, J., & Ortiz-de-Mandojana, N. (2013). Green innovation and financial performance: An institutional approach. *Organization & Environment*, *26*(4), 365–385. https://doi.org/10.1177/1086026613507931

Alauddin, M. (2023). Corporate social responsibility and ambidextrous green innovation: The role of green creativity as mediator. *Pakistan Journal of Commerce and Social Sciences (PJCSS)*, *17*(2), 214–239.

Albert, S., Ashforth, B. E., & Dutton, J. E. (2000). Organizational identity and identification: Charting new waters and building new bridges. *Academy of Management Review*, *25*(1), 13–17. https://doi.org/10.5465/amr.2000.2791600

Aldieri, L., Kotsemir, M., & Vinci, C. P. (2021). Environmental innovations and productivity: Empirical evidence from Russian regions. *Resources Policy*, *74*, 101444.

Asiaei, K., O'Connor, N. G., Barani, O., & Joshi, M. (2023). Green intellectual capital and ambidextrous green innovation: The impact on environmental performance. *Business Strategy and the Environment*, *32*(1), 369–386. https://doi.org/10.1002/bse.3136

Baquero, A. (2024). Linking green entrepreneurial orientation and ambidextrous green innovation to stimulate green performance: A moderated mediation approach. *Business Process Management Journal*, *30*(8), 71–98. https://doi.org/10.1108/BPMJ-09-2023-0703

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, *17*(1), 99–120. https://doi.org/10.1177/014920639101700108

Bruland, K., & Smith, K. (2013). Assessing the role of steam power in the first industrial revolution: The early work of Nick von Tunzelmann. *Research Policy*, *42*(10), 1716–1723.

Cainelli, G., De Marchi, V., & Grandinetti, R. (2015). Does the development of environmental innovation require different resources? Evidence from Spanish manufacturing firms. *Journal of Cleaner Production*, *94*, 211–220.

Cao, Q., Gedajlovic, E., & Zhang, H. (2009). Unpacking organizational ambidexterity: Dimensions, contingencies, and synergistic effects. *Organization Science*, *20*(4), 781–796. https://doi.org/10.1287/orsc.1090.0426

Carmeli, A., & Halevi, M. Y. (2009). How top management team behavioral integration and behavioral complexity enable organizational ambidexterity: The moderating role of contextual ambidexterity. *The Leadership Quarterly*, *20*(2), 207–218.

Chakma, R., Paul, J., & Dhir, S. (2021). Organizational ambidexterity: A review and research agenda. *IEEE Transactions on Engineering Management*, *71*, 121–137.

Chang, C. H. (2011). The influence of corporate environmental ethics on competitive advantage: The mediation role of green innovation. *Journal of Business Ethics*, *104*(3), 361–370. https://doi.org/10.1007/s10551-011-0914-x

Chang, C. H., & Chen, Y. S. (2013). Green organizational identity and green innovation. *Management Decision*, *51*(5), 1056–1070.

Chang, K. H., & Gotcher, D. F. (2020). How and when does co-production facilitate eco-innovation in international buyer-supplier relationships? The role of environmental innovation ambidexterity and institutional pressures. *International Business Review*, *29*(5), 101731.

Chang, T. W., Chen, F. F., Luan, H. D., & Chen, Y. S. (2019). Effect of green organizational identity, green shared vision, and organizational citizenship behavior for the environment on green product development performance. *Sustainability*, *11*(3), 617.

Chen, Y., Gao, L., & Zhang, Y. (2022). The impact of green organizational identity on green competitive advantage: The role of green ambidexterity innovation and organizational flexibility. *Mathematical Problems in Engineering*, *2022*, 1–18. https://doi.org/10.1155/2022/4305900

Chen, Y. S. (2008). The driver of green innovation and green image – green core competence. *Journal of Business Ethics*, *81*(3), 531–543. https://doi.org/10.1007/s10551-007-9522-1

Chen, Y. S. (2010). The drivers of green brand equity: Green brand image, green satisfaction, and green trust. *Journal of Business Ethics*, *93*(2), 307–319. https://doi.org/10.1007/s10551-009-0223-9

Chen, Y. S. (2011). Green organizational identity: Sources and consequence. *Management Decision*, *49*(3), 384–404.

Chen, Y. S., & Chang, C. H. (2013). The determinants of green product development performance: Green dynamic capabilities, green transformational leadership, and green creativity. *Journal of Business Ethics*, *116*(1), 107–119. https://doi.org/10.1007/s10551-012-1452-x

Chen, Y. S., Chang, C. H., & Lin, Y. H. (2014). The determinants of green radical and incremental innovation performance: Green shared vision, green absorptive capacity, and green organizational ambidexterity. *Sustainability*, *6*(11), 7787–7806.

Chen, Y. S., Chang, C. H., Yeh, S. L., & Cheng, H. I. (2015). Green shared vision and green creativity: The mediation roles of green mindfulness and green self-efficacy. *Quality & Quantity*, *49*(3), 1169–1184. https://doi.org/10.1007/s11135-014-0041-8

Clauss, T., Kraus, S., Kallinger, F. L., Bican, P. M., Brem, A., & Kailer, N. (2021). Organizational ambidexterity and competitive advantage: The role of strategic agility in the exploration-exploitation paradox. *Journal of Innovation & Knowledge*, *6*(4), 203–213.

de la Peña Zarzuelo, I., Soeane, M. J. F., & Bermúdez, B. L. (2020). Industry 4.0 in the port and maritime industry: A literature review. *Journal of Industrial Information Integration*, *20*, 100173.

Dubey, R., Gunasekaran, A., Childe, S. J., Fosso Wamba, S., Roubaud, D., & Foropon, C. (2021). Empirical investigation of data analytics capability and organizational flexibility as complements to supply chain resilience. *International Journal of Production Research*, *59*(1), 110–128. https://doi.org/10.1080/00207543.2019.1582820

Egelhoff, W. G. (1991). Information-processing theory and the multinational enterprise. *Journal of International Business Studies*, *22*(3), 341–368. https://doi.org/10.1057/palgrave.jibs.8490306

Gibson, C. B., & Birkinshaw, J. (2004). The antecedents, consequences, and mediating role of organizational ambidexterity. *Academy of Management Journal*, *47*(2), 209–226. https://doi.org/10.2307/20159573

Gu, S. (2023). Green innovation; a way to enhance economic performance of Chinese hotels. *International Journal of Innovation Science*, *15*(3), 406–426.

Guo, Y., Wang, L., & Yang, Q. (2020). Do corporate environmental ethics influence firms' green practice? The mediating role of green innovation and the moderating role of personal ties. *Journal of Cleaner Production*, *266*, 122054.

Hafeez, M., Yasin, I., Zawawi, D., Odilova, S., & Bataineh, H. A. (2024). Unleashing the power of green innovations: The role of organizational ambidexterity and green culture in achieving corporate sustainability. *European Journal of Innovation Management*. Retrieved from https://www.emerald.com/insight/content/doi/10.1108/EJIM-04-2023-0274/full/html

Hart, S. L. (1995). A natural-resource-based view of the firm. *The Academy of Management Review*, *20*(4), 986. https://doi.org/10.2307/258963

Hart, S. L., & Dowell, G. (2011). Invited editorial: A natural-resource-based view of the firm: Fifteen years after. *Journal of Management*, *37*(5), 1464–1479. https://doi.org/10.1177/0149206310390219

Hatch, M. J., & Schultz, M. (2002). The dynamics of organizational identity. *Human Relations*, *55*(8), 989–1018. https://doi.org/10.1177/0018726702055008181

He, Z. L., & Wong, P. K. (2004). Exploration vs. exploitation: An empirical test of the ambidexterity hypothesis. *Organization Science*, *15*(4), 481–494. https://doi.org/10.1287/orsc.1040.0078

Jarvenpaa, S. L., & Ives, B. (1994). The global network organization of the future: Information management opportunities and challenges. *Journal of Management Information Systems*, *10*(4), 25–57. https://doi.org/10.1080/07421222.1994.11518019

Jiang, W., Chai, H., Shao, J., & Feng, T. (2018). Green entrepreneurial orientation for enhancing firm performance: A dynamic capability perspective. *Journal of Cleaner Production*, *198*, 1311–1323.

Junni, P., Sarala, R. M., Taras, V., & Tarba, S. Y. (2013). Organizational ambidexterity and performance: A meta-analysis. *Academy of Management Perspectives*, *27*(4), 299–312. https://doi.org/10.5465/amp.2012.0015

Jurksiene, L., & Pundziene, A. (2016). The relationship between dynamic capabilities and firm competitive advantage: The mediating role of organizational ambidexterity. *European Business Review*, *28*(4), 431–448.

Kassotaki, O. (2022). Review of organizational ambidexterity research. *Sage Open*, *12*(1), 21582440221082127. https://doi.org/10.1177/21582440221082127

Khan, A., Chen, L. R., & Hung, C. Y. (2021). The role of corporate social responsibility in supporting second-order social capital and sustainable innovation ambidexterity. *Sustainability*, *13*(13), 6994.

Laperche, B., Lefebvre, G., & Langlet, D. (2011). Innovation strategies of industrial groups in the global crisis: Rationalization and new paths. *Technological Forecasting and Social Change*, *78*(8), 1319–1331.

Liu, X., Liu, F., & Ren, X. (2023). Firms' digitalization in manufacturing and the structure and direction of green innovation. *Journal of Environmental Management*, *335*, 117525.

Lu, H. T., Li, X., & Yuen, K. F. (2023). Digital transformation as an enabler of sustainability innovation and performance–Information processing and innovation ambidexterity perspectives. *Technological Forecasting and Social Change*, *196*, 122860.

Lubatkin, M. H., Simsek, Z., Ling, Y., & Veiga, J. F. (2006). Ambidexterity and performance in small-to medium-sized Firms: The pivotal role of top management team behavioral integration. *Journal of Management*, *32*(5), 646–672. https://doi.org/10.1177/0149206306290712

Ma, L., Ali, A., Shahzad, M., & Khan, A. (2025). Factors of green innovation: The role of dynamic capabilities and knowledge sharing through green creativity. *Kybernetes*, *54*(1), 54–70.

Ma, Y., & Wang, J. (2024). Employee green innovation behavior based on the ability-motivation-opportunity framework: Fuzzy-set qualitative comparative analysis. *Frontiers in Sustainability*, *5*, 1415832.

Mackey, T. B., Barney, J. B., & Dotson, J. P. (2017). Corporate diversification and the value of individual firms: A Bayesian approach. *Strategic Management Journal*, *38*(2), 322–341. https://doi.org/10.1002/smj.2480

March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science*, *2*(1), 71–87. https://doi.org/10.1287/orsc.2.1.71

Marco-Lajara, B., Zaragoza-Sáez, P. C., Martínez-Falcó, J., & Sánchez-García, E. (2023). Does green intellectual capital affect green innovation performance? Evidence from the Spanish wine industry. *British Food Journal*, *125*(4), 1469–1487.

Martínez-Falcó, J., Sánchez-García, E., Marco-Lajara, B., & Visser, G. (2024). Green ambidexterity innovation as the cornerstone of sustainable performance: Evidence from the Spanish wine industry. *Journal of Cleaner Production*, *452*, 142186.

Moir, L. (2001). What do we mean by corporate social responsibility? *Corporate Governance: The International Journal of Business in Society*, *1*(2), 16–22.

Mom, T. J. M., Chang, Y. Y., Cholakova, M., & Jansen, J. J. P. (2019). A multilevel integrated framework of firm hr practices, individual ambidexterity, and organizational ambidexterity. *Journal of Management*, *45*(7), 3009–3034. https://doi.org/10.1177/0149206318776775

Mulaessa, N., & Lin, L. (2021). How do proactive environmental strategies affect green innovation? The moderating role of environmental regulations and firm performance. *International Journal of Environmental Research and Public Health*, *18*(17), 9083.

Mura, M., Micheli, P., & Longo, M. (2021). The effects of performance measurement system uses on organizational ambidexterity and firm performance. *International Journal of Operations & Production Management*, *41*(13), 127–151.

Newman, A., Ucbasaran, D., Zhu, F., & Hirst, G. (2014). Psychological capital: A review and synthesis: Psychological capital: A review and synthesis. *Journal of Organizational Behavior*, *35*(S1), S120–S138. https://doi.org/10.1002/job.1916

O'Reilly, C. A., & Tushman, M. L. (2011). Organizational ambidexterity in action: How managers explore and exploit. *California Management Review*, *53*(4), 5–22. https://doi.org/10.1525/cmr.2011.53.4.5

O'Reilly, C. A., & Tushman, M. L. (2013). Organizational ambidexterity: Past, present, and future. *Academy of Management Perspectives*, *27*(4), 324–338. https://doi.org/10.5465/amp.2013.0025

O'Reilly, C. A., & Tushman, M. L. (2008). Ambidexterity as a dynamic capability: Resolving the innovator's dilemma. *Research in Organizational Behavior*, *28*, 185–206.

Pacheco, L. M., Alves, M. F. R., & Liboni, L. B. (2018). Green absorptive capacity: A mediation-moderation model of knowledge for innovation. *Business Strategy and the Environment*, *27*(8), 1502–1513. https://doi.org/10.1002/bse.2208

Peng, C., Tian, Y., Zhang, Y., Arshad, M., Ahmad, W., & Duan, Y. (2024). Exploring the impact of team psychological capital on employee green innovation within the ecosystem-oriented business models in China. *Asia Pacific Business Review*, 1–23. https://doi.org/10.1080/13602381.2024.2311753

Peterson, S. J., Luthans, F., Avolio, B. J., Walumbwa, F. O., & Zhang, Z. (2011). Psychological capital and employee performance: A latent growth modeling approach. *Personnel Psychology*, *64*(2), 427–450. https://doi.org/10.1111/j.1744-6570.2011.01215.x

Raisch, S., & Birkinshaw, J. (2008). Organizational ambidexterity: Antecedents, outcomes, and moderators. *Journal of Management*, *34*(3), 375–409. https://doi.org/10.1177/0149206308316058

Raisch, S., Birkinshaw, J., Probst, G., & Tushman, M. L. (2009). Organizational ambidexterity: Balancing exploitation and exploration for sustained performance. *Organization Science*, *20*(4), 685–695. https://doi.org/10.1287/orsc.1090.0428

Reed, K. K., Lubatkin, M., & Srinivasan, N. (2006). Proposing and testing an intellectual capital-based view of the firm. *Journal of Management Studies*, *43*(4), 867–893. https://doi.org/10.1111/j.1467-6486.2006.00614.x

Rehman, R. U., Ahmad, M. I., Belas, J., Battisti, E., & Santoro, G. (2024). Green learning orientation and corporate environmental performance: The mediation role of green knowledge acquisition-management and the moderating role of CEO-gender. *Journal of Knowledge Management*, *28*(7), 1996–2012.

Rehman, S. U., Kraus, S., Shah, S. A., Khanin, D., & Mahto, R. V. (2021). Analyzing the relationship between green innovation and environmental performance in large manufacturing firms. *Technological Forecasting and Social Change*, *163*, 120481.

Renwick, D. W. S., Redman, T., & Maguire, S. (2013). Green human resource management: A review and research agenda. *International Journal of Management Reviews*, *15*(1), 1–14. https://doi.org/10.1111/j.1468-2370.2011.00328.x

Schiederig, T., Tietze, F., & Herstatt, C. (2012). Green innovation in technology and innovation management – an exploratory literature review. *R&D Management*, *42*(2), 180–192. https://doi.org/10.1111/j.1467-9310.2011.00672.x

Severgnini, E., Vieira, V. A., & Cardoza Galdamez, E. V. (2018). The indirect effects of performance measurement system and organizational ambidexterity on performance. *Business Process Management Journal*, *24*(5), 1176–1199.

Shafait, Z., & Huang, J. (2024). Examining the impact of sustainable leadership on green knowledge sharing and green learning: Understanding the roles of green innovation and green organisational performance. *Journal of Cleaner Production*, *457*, 142402.

Shahbaz, M. H., Ahmad, S., & Malik, S. A. (2024). Green intellectual capital heading towards green innovation and environmental performance: Assessing the moderating effect of green creativity in SMEs of Pakistan. *International Journal of Innovation Science*. Retrieved from https://www.emerald.com/insight/content/doi/10.1108/IJIS-08-2023-0169/full/html

Shehzad, M. U., Zhang, J., Latif, K. F., Jamil, K., & Waseel, A. H. (2023). Do green entrepreneurial orientation and green knowledge management matter in the pursuit of ambidextrous green innovation: A moderated mediation model. *Journal of Cleaner Production*, *388*, 135971.

Sirmon, D. G., Hitt, M. A., & Ireland, R. D. (2007). Managing firm resources in dynamic environments to create value: looking inside the black box. *Academy of Management Review*, *32*(1), 273–292. https://doi.org/10.5465/amr.2007.23466005

Sirmon, D. G., Hitt, M. A., Ireland, R. D., & Gilbert, B. A. (2011). Resource orchestration to create competitive advantage: Breadth, depth, and life cycle effects. *Journal of Management*, *37*(5), 1390–1412. https://doi.org/10.1177/0149206310385695

Song, W., & Yu, H. (2018). Green innovation strategy and green innovation: The roles of green creativity and green organizational identity. *Corporate Social Responsibility and Environmental Management*, *25*(2), 135–150. https://doi.org/10.1002/csr.1445

Stubner, S., Blarr, W. H., Brands, C., & Wulf, T. (2012). Organizational ambidexterity and family firm performance. *Journal of Small Business & Entrepreneurship*, *25*(2), 217–229. https://doi.org/10.1080/08276331.2012.10593570

Su, X., Xu, A., Lin, W., Chen, Y., Liu, S., & Xu, W. (2020). Environmental leadership, green innovation practices, environmental knowledge learning, and firm performance. *Sage Open*, *10*(2), 2158244020922909. https://doi.org/10.1177/2158244020922909

Sun, Y., & Sun, H. (2021). Green innovation strategy and ambidextrous green innovation: The mediating effects of green supply chain integration. *Sustainability*, *13*(9), 4876.

Takalo, S. K., & Tooranloo, H. S. (2021). Green innovation: A systematic literature review. *Journal of Cleaner Production*, *279*, 122474.

Tang, Y., Chen, Y. J., Shao, Y. F., & Cao, Q. (2022). The impact of sustainable transformational leadership on sustainable innovation ambidexterity: Empirical evidence from green building industries of China. *Frontiers in Public Health*, *10*, 814690.

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, *18*(7), 509–533. https://doi.org/10.1002/(SICI)1097-0266(199708)18:7<509::AID-SMJ882>3.0.CO;2-Z

Tu, Y., & Wu, W. (2021). How does green innovation improve enterprises' competitive advantage? The role of organizational learning. *Sustainable Production and Consumption*, *26*, 504–516.

Úbeda-García, M., Marco-Lajara, B., Zaragoza-Sáez, P. C., Manresa-Marhuenda, E., & Poveda-Pareja, E. (2022). Green ambidexterity and environmental performance: The role of green human resources. *Corporate Social Responsibility and Environmental Management*, *29*(1), 32–45. https://doi.org/10.1002/csr.2171

Wang, J., Xue, Y., Sun, X., & Yang, J. (2020). Green learning orientation, green knowledge acquisition and ambidextrous green innovation. *Journal of Cleaner Production*, *250*, 119475.

Wang, J., Xue, Y., & Yang, J. (2020). Boundary-spanning search and firms' green innovation: The moderating role of resource orchestration capability. *Business Strategy and the Environment*, *29*(2), 361–374. https://doi.org/10.1002/bse.2369

Weiss, L., & K. Kanbach, D. (2022). Toward an integrated framework of corporate venturing for organizational ambidexterity as a dynamic capability. *Management Review Quarterly*, *72*(4), 1129–1170. https://doi.org/10.1007/s11301-021-00223-y

Zhang, Y., Sun, J., Yang, Z., & Wang, Y. (2020). Critical success factors of green innovation: Technology, organization and environment readiness. *Journal of Cleaner Production*, *264*, 121701.