ISSN 2409-2665
Journal of Logistics, Informatics and Service Science
Vol. 12 (2025) No. 12, pp. 68-86
DOI:10.33168/JLISS.2025.1205

Creative Metacognition and Ambidextrous Leadership in Service Systems: Effects on Role and Boundary-Spanning Behaviors

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Abstract. In knowledge-intensive and service-oriented organizations, leaders are increasingly required to manage both internal role performance and external boundary-spanning activities. Drawing on service and organizational perspectives, this study examines how leaders' creative metacognition influences employee role behavior and boundary work behavior through ambidextrous leadership, and how job diversity conditions these relationships. Using matched survey data from 222 leader–member dyads across public and private organizations, the proposed moderated mediation model was tested with structural equation modeling and bootstrapped PROCESS analysis. The results show that leaders' creative metacognition positively affects both role behavior and boundary work behavior, and that ambidextrous leadership partially mediates these relationships. Furthermore, job diversity moderates the indirect effects: ambidextrous leadership has a stronger influence on role behavior in low job-diversity contexts, while its effect on boundary work behavior is amplified in high job-diversity contexts. This study contributes to the service science literature by identifying creative metacognition as a cognitive foundation of ambidextrous leadership and by clarifying how leadership shapes employee behaviors critical for service delivery and boundary-spanning. The findings offer practical insights for designing leadership development and job structures that enhance adaptive service performance in dynamic organizational environments.

Keywords: creative metacognition; ambidextrous leadership; service behavior; boundary-spanning; job diversity; service systems

1. Introduction

In contemporary organizations, particularly those operating in service-oriented and knowledge-intensive environments, employee behaviors extend far beyond the execution of prescribed tasks. Employees are increasingly required to coordinate across functional boundaries, interact with external stakeholders, and adapt their work practices to dynamic and uncertain conditions. Such demands are especially salient in service systems, logistics networks, and digitally mediated organizational contexts, where value creation depends on both reliable role performance and effective boundary-spanning activities. Understanding how leadership shapes these diverse employee behaviors has therefore become a central concern in management and service science research.

Existing studies in organizational behavior and service management consistently emphasize the importance of leadership in influencing employee attitudes and behaviors. However, much of this research has focused on leaders' observable behaviors or styles, such as transformational, transactional, or servant leadership, while paying relatively limited attention to leaders' underlying cognitive processes. From a service science perspective, this represents an important gap, as service systems are not only shaped by formal structures and routines, but also by how leaders cognitively interpret complex situations, integrate competing demands, and guide employees in balancing efficiency and adaptability.

One cognitive capability that has attracted growing scholarly interest is creative metacognition, defined as individuals' awareness of, control over, and reflection on their own creative thinking processes. Creative metacognition enables leaders to recognize when creative approaches are required, evaluate alternative solutions, and adjust their thinking strategies accordingly. In complex service and logistics systems, where problems are often ill-structured and solutions must reconcile short-term operational efficiency with long-term innovation, such cognitive capabilities are particularly valuable. Yet, despite its relevance, creative metacognition has rarely been examined as a foundational driver of leadership processes and employee behaviors in service-oriented organizational settings.

At the same time, organizations increasingly face the challenge of simultaneously pursuing exploration and exploitation. This tension has been extensively discussed in the literature on organizational ambidexterity, which highlights the need to balance innovation-oriented and efficiency-oriented activities. Ambidextrous leadership, which combines opening behaviors that encourage experimentation with closing behaviors that emphasize discipline and goal attainment, has been proposed as a key mechanism for managing this tension. Prior research suggests that ambidextrous leadership can foster adaptive employee behaviors by providing both flexibility and structure. However, less is known about the cognitive antecedents of ambidextrous leadership, particularly how leaders' creative thinking processes translate into concrete leadership behaviors that influence employees in service systems.

From the employee perspective, two types of behaviors are especially critical for service effectiveness. Role behavior refers to the fulfillment of formal job responsibilities and adherence to prescribed performance standards, which ensures reliability and consistency in service delivery. Boundary work behavior, in contrast, involves interactions beyond formal role boundaries, such as coordinating with other departments, engaging external partners, or acquiring knowledge from outside the organization. In logistics and service systems, boundary-spanning behaviors are essential for managing interdependencies, responding to customer needs, and adapting to environmental changes. While prior studies have examined these behaviors separately, few have investigated how leadership simultaneously shapes both, or how different work contexts condition these effects.

An additional factor that may influence the effectiveness of leadership in shaping employee behavior is job diversity, which reflects the variety of tasks, skills, and interactions required in a job. Jobs with high diversity often expose employees to a wider range of situations and stakeholders, increasing the need for autonomy, sense-making, and boundary-spanning. Conversely, jobs with low diversity may emphasize routine execution and standardized processes. From a service system design

perspective, job diversity represents a structural condition that may amplify or constrain the impact of leadership behaviors. However, empirical evidence on how job diversity moderates the relationship between ambidextrous leadership and different types of employee behavior remains limited.

Against this backdrop, the present study aims to advance understanding of leadership and employee behavior in service-oriented organizations by integrating cognitive, behavioral, and structural perspectives. Specifically, this research investigates how leaders' creative metacognition influences employee role behavior and boundary work behavior through ambidextrous leadership, and how job diversity moderates these relationships. By examining both mediation and moderation effects within a unified framework, the study responds to calls for more nuanced models that capture the complexity of leadership processes in contemporary service systems.

This study makes three primary contributions. First, it extends the service and management literature by identifying creative metacognition as a cognitive foundation of ambidextrous leadership, thereby shifting attention from leadership behaviors alone to the cognitive processes that enable them. Second, it clarifies the differential effects of ambidextrous leadership on role behavior and boundary work behavior, highlighting how leadership supports both operational reliability and adaptive, boundary-spanning activities in service contexts. Third, it incorporates job diversity as a contextual moderator, offering insights into how job design and service system structure interact with leadership to shape employee behavior.

The remainder of the paper is organized as follows. Section 2 reviews the relevant literature and develops the research hypotheses. Section 3 outlines the research methodology and data collection procedures. Section 4 presents the empirical results, followed by a discussion of theoretical and practical implications in Section 5. Finally, Section 6 concludes the paper and suggests directions for future research.

2. Theory and Hypothesis

2.1. Creative Metacognition

Creative metacognition refers to the individual's capacity to recognize problems independently and to monitor and regulate their own cognitive processes. It is inherently linked to creative thinking, which requires more complex and dynamic interactions than routine thought processes. Creative problem solving, particularly, is shaped by the interplay of metacognition, domain knowledge, and individual traits (Mumford et al., 1991; Feldhusen, 1995). Kaufman and Beghetto (2013) conceptualized creative metacognition as the integration of self-knowledge—an awareness of one's creative strengths and weaknesses—and contextual knowledge—an understanding of when, how, and why creativity should be applied. From this perspective, creativity is not a fixed trait but a capability that manifests at varying levels depending on situational demands. Similarly, Jaušovec (2011) argued that creative problem solving unfolds through three stages: problem recognition, metacognitive monitoring, and epistemic cognition, emphasizing the pivotal role of epistemic cognition in guiding effective creative solutions. Compared to general metacognition, creative metacognition is more complex, less predictable, and particularly critical in organizational contexts. It provides systematic support for creative problem-solving in teams and enhances the adaptability of leaders and members facing novel challenges. Moreover, creative metacognition contributes to the development of a creative identity and self-beliefs (Beghetto & Karwowski, 2017), which, in turn, motivate individuals to consistently engage in creative endeavors. Prior research has also emphasized the importance of fostering supportive environments and procedural approaches for creativity (Puccio, 2002), suggesting that creative metacognition forms the foundation for effective collaboration and problem-solving within organizations.

2.2. Ambidextrous Leadership

The concept of the ambidextrous organization was first introduced by March (1991), who emphasized the importance of balancing activities of exploration—searching for new opportunities—and

exploitation—efficiently utilizing existing resources. While exploration fosters innovation and long-term growth, exploitation ensures efficiency and current performance. Organizations that can successfully pursue both dimensions simultaneously are more likely to achieve competitive advantage and sustainable growth (Tushman & O'Reilly III, 1996). A successful ambidextrous organization requires not only structural adaptation but also the alignment of leadership and organizational culture. Gibson and Birkinshaw (2004) and Raisch and Birkinshaw [14] explained that such alignment contributes to improved organizational performance. Building on this foundation, the concept of ambidextrous leadership was proposed by Rosing, Frese, and Bausch (2011). Ambidextrous leadership refers to the leader's ability to flexibly switch between transformational leadership, which stimulates exploration, and transactional leadership, which emphasizes exploitation. Zacher and Rosing (2015) further argued that leaders' open behaviors promote exploration, whereas their closing behaviors facilitate exploitation. Ambidextrous leaders, therefore, need to flexibly encourage creative thinking and experimentation in some situations while, in others, stressing clear goals and compliance with established rules. By doing so, they can exhibit leadership behaviors that align with the specific requirements of different phases of the innovation process. Bledow et al. (2011) also highlighted that the leadership behaviors required for innovation change over time, depending on the phase of the process. They further emphasized that flexible leadership adjustment is necessary to account for various contextual factors, such as organizational culture, industry characteristics, and team member attributes.

2.3. Role Behavior

Role behavior refers to the employees' expected performance within an organization based on their formally assigned duties or roles, as specified in job descriptions and aligned with organizational expectations (Katz, & Kahn, 2015). Such behaviors are evaluated against clearly defined criteria and are essential for achieving organizational goals and maintaining consistency (Williams & Anderson, 1991). Role behavior can be broadly categorized into in-role behavior and extra-role behavior (Pace et al., 2021). In-role behavior denotes the execution of tasks explicitly defined by supervisors or organizational directives, while extra-role behavior involves discretionary actions that go beyond formal requirements. The latter can positively influence both overall organizational performance and interpersonal relationships among colleagues (Zheng et al., 2021). Prior studies have highlighted the significance of role behavior in organizational contexts. Pincus (1986) argued that role behavior is a core determinant of both job satisfaction and job performance. Piercy et al. (2006) further explained that when perceived organizational support and managerial control function effectively, organizational citizenship behaviors increase, thereby enhancing in-role performance. Self-management ability has been identified as a positive predictor of job performance, while the interrelationships among job satisfaction, organizational commitment, and role behavior have also been emphasized (Tett & Meyer, 1993). In sum, role behavior is closely tied to the formal execution of duties within organizations and is regarded as a critical factor driving organizational performance.

2.4. Boundary Work Behavior

Boundary work refers to a set of activities undertaken by a profession, discipline, or organization to protect and sustain its expertise and authority, encompassing processes of boundary setting and management (Gieryn, 1983). Within organizations, boundary work is typically categorized into three forms: boundary spanning, boundary buffering, and boundary reinforcement (Faraj & Yan, 2009). Boundary spanning involves fostering collaboration and information exchange with external actors, thereby enhancing innovation and adaptability (Aldrich & Herker, 1977; Tushman & Scanlan, 1981). Leaders play a critical role in initiating boundary-spanning activities by building trust and promoting open communication, which in turn positively influences team performance and innovation (Marrone et al., 2007). In contrast, boundary buffering serves to shield the team from external disturbances and to secure internal stability. It helps maintain the team's emotional energy and contributes to improving innovative outcomes under conditions of task overload (Wu et al., 2020). Boundary spanning and

buffering are often complementary; case studies have demonstrated that striking a balance between the two is essential for successful boundary management (Lehrer & Celo, 2017; Zhang et al., 2022). Finally, boundary reinforcement functions as a mechanism for protecting organizational identity and authority, strengthening goal attainment and internal cohesion (Faraj & Yan, 2009). It enables organizations to filter out external uncertainty, foster intra-team collaboration, support innovation and learning, and optimize resource utilization and team performance (Kislov, 2018; Shin et al., 2019). Taken together, boundary spanning, buffering, and reinforcement represent essential strategies for organizations seeking to balance innovation and stability in dynamic environments. Effective boundary management thus constitutes a critical determinant of team and organizational performance.

2.5. Job Diversity

Job diversity refers to the breadth and variety of tasks and roles performed within an organization, encompassing the nature of work, task complexity, required skills, and the degree of interdependence among tasks (Jones et al., 2020). Job diversity has been shown to positively influence organizational flexibility, creativity, and adaptability, particularly by enabling members with diverse skills and knowledge to collaborate effectively in response to environmental changes (Flynn, 1995). Moreover, job diversity fosters an inclusive and cooperative organizational culture, promotes mutual respect and communication among employees, and contributes to both individual capability development and organizational performance (Kreitner et al., 2001). Job diversity can be understood in terms of two key attributes: task variety and interdependence (Perrow, 1967). Task variety refers to the complexity and range of tasks within a job. High task variety requires multiple skills and broader knowledge, while low task variety typically consists of repetitive and simple tasks. Interdependence refers to the necessary degree of collaboration with colleagues or other departments to accomplish tasks. High interdependence necessitates close cooperation, whereas low interdependence emphasizes independent task execution. By encouraging diverse perspectives and cognitive approaches, job diversity facilitates the complex problem-solving and generation of innovative ideas (Kreitner et al., 2001). It further enhances organizational resilience, adaptability, and strategic agility, strengthening the ability to respond flexibly to changing market environments (Duchek, 2020; Rožman et al., 2023). At the strategic level, job diversity among top management teams improves the quality of organizational decision-making and positively contributes to organizational sustainability and competitiveness (Díaz-Fernández et al., 2016). When effectively managed in conjunction with strong leadership, job diversity plays a crucial role in building an inclusive organizational culture, enhancing job satisfaction, and simultaneously improving organizational performance (Turi et al., 2022).

2.6. Creative Metacognition and Ambidextrous Leadership

Self-awareness and self-regulation are essential components of effective leadership. In particular, the ability of leaders to reflect on and adjust their own thinking processes, known as metacognition, plays a critical role in enhancing strategic thinking and the quality of decision-making (Wu & Was, 2023). Metacognitive skills, including planning, monitoring, and evaluation, enable leaders to solve complex problems and foster creative organizational environments effectively (Jiaet al., 2019). Metacognition allows leaders to identify their cognitive strengths and weaknesses, develop leadership competencies through self-regulation, and directly contribute to creative problem-solving and innovative decision-making (Black et al., 2016). In this context, ambidextrous leadership refers to the leader's ability to flexibly switch between opening behaviors and closing behaviors depending on the situation (Rosing & Zacker, 2023). Opening behaviors, rooted in transformational leadership, promote creativity and innovation, while closing behaviors, aligned with transactional leadership, help maintain organizational efficiency and stability (March, 1991; Alghamdi, 2018). Ambidextrous leadership has been demonstrated to positively impact the creation of creative environments and foster innovative behaviors among organizational members. Leaders must maintain a balance between fostering creativity and ensuring operational stability through a flexible leadership style (Kafetzopoulos, 2022; Akıncı &

Alpkan, 2022).

Based on this theoretical background, the following hypothesis is proposed:

Hypothesis 1. A leader's creative metacognition will have a positive effect on ambidextrous leadership.

2.7. Creative Metacognition and Employee Behaviors

Creative metacognition refers to an individual's ability to recognize problems and regulate their thinking, which is essential for creative problem-solving (Mumford et al., 1991; Feldhusen, 1995). It integrates self-knowledge and contextual knowledge (Kaufman & Beghetto, 2013) and is driven by metacognitive stages such as problem identification, monitoring, and epistemic cognition. Creative metacognition also shapes creative identity and sustains motivation for creative engagement (Beghetto & Karwowski, 2017), supporting effective collaboration and structured problem-solving within organizations (Puccio, 2002). Role behavior involves task-related actions aligned with formal job expectations (Williams & Anderson, 1991). It includes in-role behavior (assigned tasks) and extra-role behavior (voluntary contributions) (Pace, 2021; Zheng, 2021). Role behavior is strongly linked to job satisfaction and performance (Piercy et al., 2006; Tett & Meyer, 1993). Boundary work Behavior refers to managing organizational boundaries to protect authority and expertise (Gieryn, 1983). It includes boundary spanning (Aldrich & Herker, 1977; Tushman & Scanlan, 1981), boundary buffering (Wu et al., 2020), and boundary reinforcement (Faraj, & Yan, 2009). Leaders play a key role in driving boundary spanning (Marrone et al., 2007), and balancing boundary activities enhances team innovation and stability (Lehrer & Celo, 2017; Zhang et al., 2022; Kislov, 2018; Shin et al., 2019).

Based on this theoretical background, the following hypothesis is proposed:

Hypothesis 2. A leader's creative metacognition will have a positive effect on employee's role behavior.

Hypothesis 3. A leader's creative metacognition will have a positive effect on employee's boundary work behavior.

2.8. Ambidextrous Leadership and Employee Behaviors

Ambidextrous leadership plays a key role in fostering innovative behaviors by flexibly combining opening and closing behaviors (Wang et al., 2021). Opening behaviors encourage the exploration of new ideas, while closing behaviors emphasize efficiency and stability. The balance between these behaviors strengthens both creativity and implementation. This leadership style supports employees in proposing new solutions without fear of failure while maintaining organizational consistency (Usman et al., 2022). Opening behaviors promote creative thinking, whereas closing behaviors enhance efficiency through clear structures and rewards (Pieterse et al., 2010). Leaders who apply both behaviors flexibly help employees engage more actively in creative role behaviors (Jabeen et al., 2023; Jiang et al., 2023). Sustaining innovation requires actively integrating external resources (Zhang & Li, 2023). Leaders foster boundary work behaviors by building networks and encouraging the use of external information (Xue & Woo, 2022), which enables organizations to respond flexibly to change (Alghamdi, 2018). Organizations must also support failure-tolerant cultures to promote boundary activities (Hou et al., 2023). Ambidextrous leadership enhances boundary work by striking a balance between exploration and exploitation. Boundary spanning involves bringing external resources into the organization (Malik et al., 2024), boundary buffering reduces external interference to ensure quality and stability (Wu et al., 2020), and boundary reinforcement protects organizational boundaries to support both stability and innovation (Harandi et al., 2024).

Based on this theoretical background, the following hypotheses are proposed:

Hypothesis 4. Ambidextrous Leadership will have a positive effect on employee's role behavior.

Hypothesis 5. Ambidextrous Leadership will have a positive effect on employee's boundary work

behavior.

2.9. The Mediating Role of Ambidextrous Leadership

Ambidextrous leadership plays a crucial role in maximizing organizational performance by striking a balance between exploratory and exploitative behaviors, thereby simultaneously pursuing both organizational change and stability. Exploratory behavior emphasizes ethical standards, encourages employees to share the organization's vision and values, and fosters innovation. In contrast, exploitative behavior strengthens discipline and efficiency through clear rules and reward systems, reinforcing ethical conduct (Iqbal et al., 2023). Leaders' opening behaviors provide autonomy and inspiration, driving long-term performance and promoting boundary work behaviors that enhance creative outcomes (Nelly et al., 2024; Wadei et al., 2021). Opening behaviors are especially important in supporting organizational innovation through collaboration with external networks (Chen et al., 2021). Conversely, closing behaviors focus on setting clear goals and evaluating performance and indirectly promote innovative behavior by facilitating knowledge sharing and increasing work engagement (Udin et al., 2022). Through this balance of exploration and exploitation, ambidextrous leadership encourages knowledge sharing, role expansion, and boundary work within the organization. It is expected to mediate the relationship between creative metacognition and both role behavior and boundary work behavior.

Based on this, the following hypotheses are proposed:

Hypothesis 6. Ambidextrous Leadership will mediate the relationship between a leader's creative metacognition and an employee's role behavior.

Hypothesis 7. Ambidextrous Leadership will mediate the relationship between a leader's creative metacognition and employees' boundary work behavior.

2.10. The Moderating Role of Ambidextrous Leadership

Job diversity refers to the performance of complex tasks that require a variety of skills and talents and is considered a key factor in enhancing employees' job adaptability and performance (Lan & Chen, 2020). In such environments, leaders' resource provision and support become increasingly important, potentially strengthening the influence of ambidextrous leadership (Bakker, & Demerouti, 2017). Job diversity increases the need for leaders to coordinate exploratory and exploitative behaviors flexibly, and flexible leadership can further enhance organizational innovation and productivity (Engelen et al., 2014). Job diversity also encourages employees to voluntarily take on diverse roles, which leads to higher job satisfaction, reduced turnover intention, and increased boundary work behavior (Ahmad, 2018; Lee et al., 2023). It is expected that job diversity will moderate the mediating effect of ambidextrous leadership in the relationships between creative metacognition, role behavior, and boundary work behavior.

Based on this, the following hypotheses are proposed:

Hypothesis 8. Job diversity will moderate the mediating effect of ambidextrous leadership in the relationship between a leader's creative metacognition and employees' role behavior.

Hypothesis 9. Job diversity will moderate the mediating effect of ambidextrous leadership in the relationship between a leader's creative metacognition and employees' boundary work behavior.

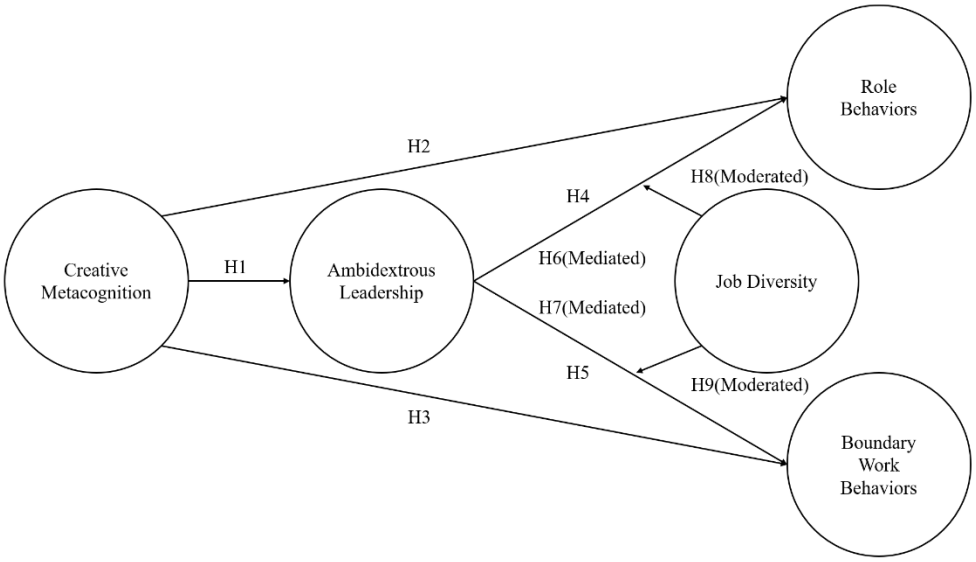

Fig. 1: Theoretical model

3. Method

3.1. Subjects and Methodology

This study was conducted to examine the impact of leaders' creative metacognition on the role behavior and boundary work behavior of organizational members, and to analyze the mediating role of ambidextrous leadership. Data were collected from leaders and followers across various occupational groups in both public and private organizations in South Korea over a seven-month. A total of 250 teams were selected as the survey sample. Data were collected by matching each leader and follower within the same team on a 1:1 basis. To minimize sensitivity and bias, leaders and followers were instructed to complete separate questionnaires. A self-report survey method was employed, and to reduce the potential for leniency bias, self-evaluation and peer-evaluation items were measured separately. After excluding incomplete responses, a total of 222 matched leader–member pairs (88.8% responded) were included in the final analysis.

Among the participating leaders, 142 were male (63.7%) and 80 were female (36.3%), with a higher proportion of males. The age distribution of leaders was as follows: 3 participants in their 20s (1.4%), 37 in their 30s (16.7%), 97 in their 40s (43.7%), 79 in their 50s (35.6%), and 6 participants aged 60 or older (2.7%). The leaders' tenure in their current position was as follows: less than 1 year (8.6%), more than 1 year to 3 years (10.8%), more than 3 years to 5 years (14.9%), more than 5 years to 7 years (15.3%), more than 7 years to 9 years (20.3%), and more than 9 years (30.2%). The average number of team members per team was approximately 7 people. For the organizational members, 120 were male (54.1%) and 102 were female (45.9%), indicating a slightly higher proportion of males. Their age distribution was as follows: 96 participants in their 20s (43.2%), 70 in their 30s (31.5%), 45 in their 40s (20.3%), 10 in their 50s (4.5%), and 1 participant aged 60 or older (0.5%).

3.2. Measures

The structural model demonstrated an acceptable level of fit. The model fit indices were as follows: χ^2 = 3,589.720, df = 2,129, CFI = .900, TLI = .896, IFI = .900, RMSEA = .055, and SRMR = .496. Based on these values, the model can be considered to meet generally acceptable thresholds (RMSEA < .060, CFI ≥ .900). The factor loadings for the independent variable, creative metacognition, ranged from .715 to .847. For the mediating variable, ambidextrous leadership, the factor loadings for closing behavior ranged from .724 to .843, and for opening behavior, they ranged from .840 to .870. The dependent variable, role behavior, showed factor loadings ranging from .674 to .927, while boundary work behavior showed loadings ranging from .659 to .803. For the moderating variable, job diversity, factor

loadings ranged from .468 to .794. Although one item (Job Diversity 5) showed a relatively low factor loading of .468, the majority of items exceeded the recommended threshold of .50 for convergent validity. The overall RMSEA was .055 and the SRMR was .496, which fall within acceptable ranges, indicating that the model is reasonably well-fitted.

Creative Metacognition was measured by assessing whether individuals recognize problems, generate ideas, improve those ideas, and implement them in their creative thinking processes. The measurement tool was based on the Creative Metacognition Scale (CMCS) developed by An, Kwon, and Pyo (2023). Creative metacognition encompasses four key dimensions: problem identification, idea generation, idea improvement, and idea implementation. Each dimension was measured using nine items, totaling 36 items. Each factor initially included nine items, but two items were removed from each factor during the scale refinement process (problem identification 4 & 9, idea generation 4 & 9, idea improvement 3 & 8, idea implementation 1 & 7). As a result, a total of 28 items were used to measure creative metacognition in this study. The scale exhibited a Cronbach's α value of .981, CR value of .977, AVE value of .604.

Ambidextrous Leadership was assessed using the scale developed by Rosing, Frese, and Bausch (2011), which measures the leader's opening behaviors (exploratory characteristics) and closing behaviors (exploitative characteristics). A total of 14 items were used, with seven items for opening behaviors and seven items for closing behaviors. The opening behavior of exhibited a Cronbach's α value of .949, CR value of .906, AVE value of .578. The closing behavior scale exhibited a Cronbach's α value of .920, CR value of .918, AVE value of .615.

Role Behavior was measured by assessing the degree to which individuals perform behaviors expected of them based on their assigned roles, which correspond to specific tasks or positions within the organization. The measurement tool developed by Williams and Anderson (1991) was used, consisting of seven items. The scale exhibited a Cronbach's α value of .945, CR value of .902, AVE value of .571.

Boundary Work Behavior refers to actions through which individuals or teams interact across internal and external organizational boundaries to secure resources or exchange information. It includes collaboration, coordination, and information sharing with other departments or external stakeholders. The measurement scale developed by Faraj and Yan (2009) was used. Boundary work behavior consists of three dimensions: boundary reinforcement, boundary buffering, and boundary spanning, with four items for each dimension, totaling 12 items. The scale exhibited a Cronbach's α value of .941, CR value of .954, AVE value of .661.

Job Diversity was measured as the degree of variety in tasks and activities performed within an individual's job. The scale developed by Morgeson and Humphrey (2006) was used, consisting of eight items. The scale exhibited a Cronbach's α value of .829, CR value of .919, AVE value of .643.

Discriminant validity was assessed using the method proposed by Anderson and Gerbing (1988), which involves calculating the confidence intervals of correlation coefficients using ± 2 times the standard error (S.E.). According to this method, discriminant validity is confirmed when the confidence interval does not include the value of 1, indicating that the constructs are statistically independent (Jöreskog, 1971; Anderson & Gerbing, 1988). The confidence intervals between creative metacognition and other constructs ranged from .371 to .999, excluding the value of 1. For ambidextrous leadership (both closing and opening behaviors), the confidence intervals ranged from .266 to .987, which also did not include 1. The confidence interval between role behavior and other constructs ranged from .266 to .959, while the interval for boundary work behavior ranged from .294 to .999, neither of which included 1. Additionally, the confidence interval between job diversity and other constructs ranged from .294 to .987, also excluding 1. These results indicate that discriminant validity was adequately established among the core constructs of this study.

4. Result

4.1. Descriptive Statistics

The study found strong relationships between the factors of Creative Metacognition, Ambidextrous Leadership, Role Behavior, Boundary Work Behavior, and Job Diversity, as described in Table 1.

Table 1: Correlation among research variables

Valuable	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12
1														
2			-.259**											
3			-.121	-.001										
4			-.009	.137*	.043									
5			-.033	-.016	.270**	.137*								
6			.053	.007	-.038	.184**	-.030							
7	7.604	4.619	-.070	-.013	.081	.258**	.188**	.029						
8	3.005	.968	-.099	.248**	-.099	.185**	.076	.160*	.235**					
9	3.014	.928	-.010	.234**	-.153*	.209**	.050	.134*	.252**	.768**				
10	3.277	1.006	-.075	.313**	-.055	.228**	.042	.198**	.206**	.740**	.792**			
11	3.183	1.051	.015	.227**	-.172*	.246**	.060	.169*	.259**	.829**	.802**	.718**		
12	2.752	.875	-.120	.192**	-.085	.286**	.144*	.084	.160*	.795**	.767**	.674**	.750**	
13	3.005	.796	-.031	.155*	-.081	.215**	.068	.190**	.283**	.750**	.730**	.797**	.737**	.657**

*Note : n=222 *p<.05, **p<.01, 1=Gender(Leader), 2=Gender(Follower), 3=Age(Leader), 4=Age(Follower), 5=Tenure(Leader), 6=Tenure(Follower), 7=Team Size, 8=Creative Metacognition, 9= Closing Behavior(Ambidextrous Leadership), 10=Opening Behavior(Ambidextrous Leadership) 11=Role Behavior, 12=Boundary Work Behavior, 13=Job Diversity*

4.2. Hypotheses Test

To verify the mediating effect of ambidextrous leadership, this study employed PROCESS MACRO, developed by Hayes (2018). The analysis was conducted using bootstrapping with 5,000 resamples and a 95% confidence interval (CI). The gender (leader & follower) , and the age (leader & follower) were included as control variables. This analysis was tested by calculating the lower limit (LLCI) and upper limit (ULCI) of the confidence intervals for the indirect effect between creative metacognition and role behavior, as well as between creative metacognition and boundary work behavior.

Previous studies have measured ambidextrous leadership by combining the two key leadership behaviors: opening leadership behavior and closing leadership behavior (Zacher & Rosing, 2015). Following this approach, the present study also utilized the interaction term (Opening Leadership × Closing Leadership) to measure and analyze ambidextrous leadership.

Table 2: Result of structural model

Hypothesis	Path (Relationship)	Unstandardized Estimate	S.E.	t-value	Supported
1	Creative Metacognition → Ambidextrous Leadership	4.176	.248	16.809***	Yes
2	Creative Metacognition → Role Behavior	.628	.059	10.612***	Yes
3	Creative Metacognition → Boundary work Behavior	.431	.052	8.281***	Yes
4	Ambidextrous Leadership → Role Behavior	.061	.011	5.736***	Yes

5	Ambidextrous Leadership → Boundary work Behavior	.064	.009	8.281***	Yes

The PROCESS MACRO developed by Hayes (2018) does not directly provide the significance level (p-value) for the indirect effect; the significance of the mediation effect was verified based on the bootstrapped confidence intervals. For the mediation effect of ambidextrous leadership between creative metacognition and role behavior, the confidence interval for the indirect effect ranged from .144 to .376, indicating a significant effect. Similarly, for the mediation effect of ambidextrous leadership between creative metacognition and boundary work behavior, the confidence interval for the indirect effect ranged from .154 to .366, which also did not include zero, confirming the significance of the mediation effect.

Table 3: Mediating effect of ambidextrous leadership

Hypothesis	Path (Relationship)	Total Effect	Direct Effect	Indirect Effect	Supported
6	Creative Metacognition → Ambidextrous Leadership → Role Behavior	.883***	.628***	.255	Yes
7	Creative Metacognition → Ambidextrous Leadership → Boundary Work Behavior	.697***	.432***	.265	Yes

Specifically, the mediation effect of ambidextrous leadership decreased as job diversity levels shifted from low (-1.005) to high (.661). The magnitude of the indirect effect also reduced from .306 in the low job diversity group to .167 in the high job diversity group. The results showed that as job diversity increased from low to high, the influence of ambidextrous leadership on role behavior weakened. Particularly, when job diversity was low, the positive effect of ambidextrous leadership on role behavior was more substantial, whereas this effect diminished in high job diversity groups. This indicates that the impact of ambidextrous leadership is more effective when job diversity is low.

Table 4: Moderating Effect of job diversity in ambidextrous leadership and role behavior

Direct Effect	Effect	S.E.	t-value	LLCI	ULCI
Role Behavior	.544	.064	8.463***	.417	.670

Indirect Effect		Effect	S.E.	LLCI	ULCI
Job Diversity	-1.005	.306	.080	.154	.464
	.161	.209	.062	.091	.335
	.661	.167	.065	.041	.297

*** p<.001, (Path) Creative Metacognition → Ambidextrous Leadership → Role Behavior

The Moderated Effect of Job Diversity

Index	S.E.	LLCI	ULCI
-.084	.041	-.161	-.001

Control Variable: Gender (Leader & Follower), Age (Leader & Follower)

This indicates that the influence of ambidextrous leadership becomes stronger with higher levels of job diversity, as reflected by the increase in the effect size (from -.023 to -.118 to -.160). The confidence intervals for the indirect effect at different levels of job diversity showed that for the medium and high job diversity groups, the lower limit (LLCI = -.262) and upper limit (ULCI = -.061) did not include zero, indicating significant effects. However, in the low job diversity group, the confidence interval (LLCI =

-.051, ULCI = .002) crossed zero, suggesting a non-significant effect at low levels of job diversity. Additionally, the bootstrapped confidence interval for the moderating effect ranged from -.135 to -.041, which did not include zero, confirming that the moderating effect of job diversity was statistically significant.

Table 5: Moderating effect of job diversity in ambidextrous leadership and boundary work behavior

Direct Effect		Effect	S.E.	t-value	LLCI	ULCI
Boundary Work Behavior		.555	.050	11.103***	.457	.654
Indirect Effect		Effect	S.E.	LLCI	ULCI	
Job Diversity	-1.005	-.203	.015	-.051	.002	
	.161	-.118	.035	-.197	-.061	
	.661	-.160	.046	-.262	-.083	

*** p<.001, (Path) Creative Metacognition → Ambidextrous Leadership → Boundary Work Behavior

The Moderated Effect of Job Diversity

Index	S.E.	LLCI	ULCI
-.082	.024	-.135	-.041

Control Variable: Gender (Leader & Follower), Age (Leader & Follower)

The analysis revealed that when job diversity was divided into low and high levels based on the mean value, the influence of ambidextrous leadership on role behavior was more decisive in groups with low job diversity. Specifically, in contexts of low job diversity where the scope of tasks and roles is relatively clear and limited, ambidextrous leadership—balancing exploratory and exploitative behaviors—provides clear guidance and direction, thereby encouraging employees to perform their roles faithfully and respond appropriately to task requirements.

In contrast, in groups with high job diversity, the scope of roles and tasks becomes broader and more complex, leading employees to adjust their tasks and redefine their roles autonomously. In such contexts, the influence of ambidextrous leadership diminishes, as employee autonomy takes on a greater role in shaping role behavior. Consequently, the relationship between ambidextrous leadership and role behavior becomes less significant as job diversity increases. These findings suggest that the effectiveness of ambidextrous leadership is maximized in low job diversity settings, whereas in high job diversity contexts, employee autonomy emerges as a more critical factor.

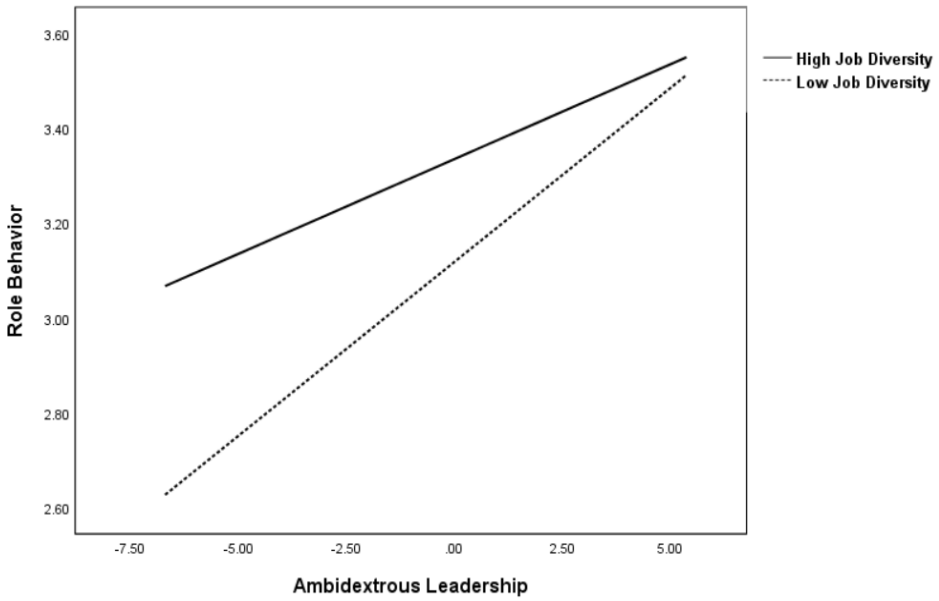

Fig. 2: Moderating effect of job diversity in role behavior

The results concerning boundary work behavior demonstrated the opposite pattern. As job diversity increased, the influence of ambidextrous leadership on boundary work behavior became stronger. In low job diversity settings, where tasks are relatively simple and the need for external collaboration is limited, the ability of ambidextrous leadership to foster boundary work behavior remains constrained. However, in high job diversity groups, where tasks are more complex and require frequent collaboration with diverse stakeholders, ambidextrous leadership plays a pivotal role. Leaders who adopt an ambidextrous style enable employees to engage in exploratory efforts to secure new external resources while simultaneously strengthening existing collaborative relationships through exploitative approaches. Accordingly, in high job diversity contexts, the effect of ambidextrous leadership on boundary work behavior is amplified, functioning as a catalyst for inter-unit collaboration and external resource mobilization**.**

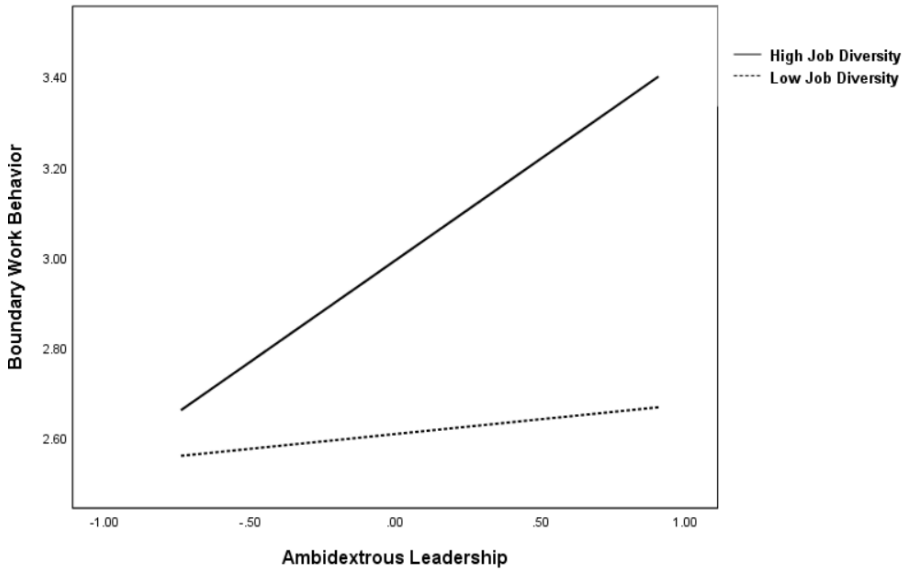

Fig. 3: Moderating effect of job diversity in boundary work behavior

5. Conclusion

This study expands the understanding of ambidextrous leadership by exploring its effects not only on innovation and performance but also on employee behaviors, specifically role behavior and boundary work behavior. Unlike previous studies that primarily focused on performance outcomes (Zacher, H., & Rosing; 2015; Alghamdi, F. 2018; Probst, 2011), this study emphasizes the influence of ambidextrous leadership on employee behavior within the organizational context. Moreover, while antecedents of ambidextrous leadership have been rarely addressed in prior research, this study identifies creative metacognition as a key antecedent, offering a new theoretical perspective. The findings confirm that creative metacognition has a positive effect on both role behavior and boundary work behavior. Employees with strong creative metacognition can effectively monitor and regulate their creative thinking, enabling them to exceed formal job requirements and actively engage in cross-boundary collaboration (Mumford, M. D. 2003; Schraw, & Dennison, 1994). This highlights that creative thinking in organizations should not be limited to idea generation but should also focus on converting ideas into meaningful actions that contribute to both individual and organizational success. Moreover, boundary work behavior, which includes acquiring external resources and fostering collaboration beyond organizational boundaries (Ancona, D. G., & Caldwell, D. F. 1992), is significantly enhanced by creative metacognition, especially in rapidly changing environments. Ambidextrous leadership was found to play a partial mediating role in the relationship between creative metacognition and employee behaviors. Leaders who balance exploratory and exploitative behaviors can support employees in translating creative ideas into practical results, thereby enhancing organizational efficiency and adaptability (Gibson & Birkinshaw, J. 2004; Raisch & Birkinshaw, J. 2008). The dual approach of encouraging creative exploration while ensuring systematic execution is critical in fostering sustainable innovation within teams. Furthermore, job diversity was confirmed as a significant moderating variable. The study revealed that in teams with low job diversity, the influence of ambidextrous leadership on role behavior was stronger, indicating that leader guidance is particularly essential when employees lack diverse task experiences (Tushman, & O'Reilly III, 1996; Wang & Rafiq, 2014). In contrast, in high-diversity teams, employee autonomy tends to increase, reducing the leader's direct influence on role behavior but enhancing the leader’s impact on boundary work behavior. This suggests that leadership strategies should be carefully adapted to the team’s job diversity level to optimize employee engagement and cross-boundary collaboration (Ancona, & Caldwell, 1992; Dun, 2022; Dongre, 2024)

From a practical standpoint, organizations should place greater emphasis on developing employees’ creative metacognition as a strategic capability. Investment in systematic programs—such as problem-solving workshops, creative thinking training, design-thinking projects, and reflective learning sessions—can help employees recognize problems more effectively, monitor their thought processes, and regulate their own creative efforts. These programs not only enhance individual problem-solving skills but also cultivate a broader organizational culture that values and supports creativity. In particular, reflective practices such as after-action reviews and structured feedback loops can encourage employees to critically evaluate their cognitive strategies, thereby reinforcing continuous learning and improvement. In parallel, leaders must be systematically trained to adopt and apply ambidextrous leadership in a flexible and context-sensitive manner. This requires balancing two often competing demands: on the one hand, fostering innovative and exploratory ideas; on the other, ensuring that these ideas are implemented in a structured, efficient, and performance-oriented manner. Training programs should therefore expose leaders to simulations, case studies, and role-playing exercises that allow them to practice switching between transformational behaviors (e.g., inspiring creativity, encouraging experimentation) and transactional behaviors (e.g., clarifying expectations, monitoring progress, and enforcing standards). Specific practices, such as holding regular innovation forums, providing structured resource support, and establishing cross-functional project teams, can serve as effective mechanisms to sustain this balance. The findings also highlight the importance of tailoring leadership approaches to the level of job diversity within teams. In teams with low job diversity, where tasks and

roles are relatively narrow and standardized, leaders should provide more active guidance, close supervision, and motivational support to stimulate employees' engagement in creative role behavior. Conversely, in high-diversity teams, where members are exposed to a wide range of tasks and interdependencies, leaders should respect and leverage employee autonomy, focusing instead on facilitating external collaboration and encouraging boundary work activities. This requires leaders to adopt a coaching mindset, remove barriers to collaboration, and act as connectors between teams and external stakeholders. At the organizational level, building robust external networks, fostering partnerships with diverse stakeholders, and promoting knowledge exchange across organizational and industry boundaries are essential strategies for enhancing boundary work behaviors. Such initiatives not only expand access to external resources but also strengthen organizational agility and resilience in the face of dynamic environmental challenges. Practices such as inter-organizational learning communities, industry consortia, and strategic alliances can provide fertile ground for creative ideas to flow into the organization and be translated into innovative outcomes.

Despite its valuable contributions, this study has several limitations that must be acknowledged. First, the research was conducted within Korean organizations, which may limit the generalizability of the findings to different cultural or institutional contexts. National culture and industry structure may significantly shape the interaction between creative metacognition, ambidextrous leadership, and job diversity; therefore, comparative studies across countries are needed. Second, the cross-sectional research design constrains the ability to capture long-term effects, dynamic shifts, and causal relationships. Creative processes and leadership behaviors evolve over time, and longitudinal studies provide a richer understanding of these dynamics. Third, although efforts were made to separate leader and follower responses, the reliance on self-report measures may still be subject to biases such as social desirability or common method variance. Multi-source data collection, incorporating peer ratings, archival performance records, or observational methods, would enhance the robustness of future findings. Fourth, the study conceptualized job diversity at a general level without distinguishing between its specific dimensions, such as functional diversity, demographic diversity, or experiential diversity. Each of these facets may exert different effects on role behavior and boundary work behavior. Moreover, the possibility of non-linear relationships among the variables—such as diminishing returns or curvilinear effects of job diversity—was not addressed in the present research. Future studies that adopt a more fine-grained approach will provide deeper insights into the optimal conditions under which ambidextrous leadership and creative metacognition generate positive outcomes.

In conclusion, this study provides significant theoretical and practical insights for organizations aiming to enhance creative performance and boundary work behaviors by leveraging creative metacognition, ambidextrous leadership, and job diversity. For practitioners, the findings suggest that organizational success in dynamic environments depends not only on cultivating individual creative capacities but also on designing leadership development systems and structural supports that align with varying task and team contexts. For scholars, the study opens new avenues for examining how cognitive and behavioral mechanisms jointly shape innovation and adaptability across different cultural and industrial settings.

References

Ahmad, A. (2018). The relationship among job characteristics, organizational commitment, and employee turnover intentions: A reciprocation perspective. *Journal of Work-Applied Management*, 10(1), 74–92. https://doi.org/10.1108/JWAM-09-2017-0027

Akıncı, G., & Alpkan, L. (2022). Ambidextrous leadership and creative tendency: Trust in leader as mediator. *European Proceedings of Social and Behavioural Sciences*, 80–87. https://doi.org/10.15405/epsbs.2022.12.02.7

Aldrich, H., & Herker, D. (1977). Boundary spanning roles and organization structure. *Academy of Management Review*, 2(2), 217–230. https://doi.org/10.5465/amr.1977.4409044

Alghamdi, F. (2018). Ambidextrous leadership, ambidextrous employee, and the interaction between ambidextrous leadership and employee innovative performance. *Journal of Innovation and Entrepreneurship*, 7(1), 1–14. https://doi.org/10.1186/s13731-018-0081-8

An, D., Kwon, Y., & Pyo, J. (2023). Development and validation of the creative metacognition scale (CMCS). *The Journal of Creativity Education*, 23(1), 1–25. https://doi.org/10.36358/JCE.2023.23.1.1

Ancona, D. G., & Caldwell, D. F. (1992). Bridging the boundary: External activity and performance in organizational teams. *Administrative Science Quarterly*, 37, 634–665. https://doi.org/10.2307/2393475

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, 103(3), 411–423. https://doi.org/10.1037/0033-2909.103.3.411

Bakker, A. B., & Demerouti, E. (2017). Job demands–resources theory: Taking stock and looking forward. *Journal of Occupational Health Psychology*, 22(3), 273–285. https://doi.org/10.1037/ocp0000056

Beghetto, R. A., & Karwowski, M. (2017). Toward untangling creative self-beliefs. In *The Creative Self* (pp. 3–22). Elsevier. https://doi.org/10.1016/B978-0-12-809790-8.00001-7

Black, H., Soto, L., & Spurlin, S. (2016). Thinking about thinking about leadership: Metacognitive ability and leader developmental readiness. *New Directions for Student Leadership*, 2016(149). https://doi.org/10.1002/yd.20164

Bledow, R., Frese, M., & Mueller, V. (2011). Ambidextrous leadership for innovation: The influence of culture. *Advances in Global Leadership*, 6, 41–69. https://doi.org/10.1108/S1535-1203(2011)0000006006

Chen, L., Zheng, W., Yang, B., & Bai, S. (2016). Transformational leadership, social capital, and organizational innovation. *Leadership & Organization Development Journal*, 37(7), 843–859. https://doi.org/10.1108/LODJ-07-2015-0157

Díaz-Fernández, M. C., González-Rodríguez, M. R., & Simonetti, B. (2016). The role played by job- and non-job-related TMT diversity traits on firm performance and strategic change. *Management Decision*, 54(5), 1110–1139. https://doi.org/10.1108/MD-10-2015-0464

Dongre, A. N. (2024). Enhancing organizational efficiency through employee well-being initiatives: Importance, impact, and strategic insights. *International Journal of Smart Business and Technology*, 12(1), 39–48. https://doi.org/10.21742/IJSBT.2024.12.1.05

Duchek, S., Raetze, S., & Scheuch, I. (2020). The role of diversity in organizational resilience: A theoretical framework. *Business Research*, 13(2), 387–423. https://doi.org/10.1007/s40685-019-0084-8

Dun, J. (2022). Thick data analytics: A detailed analysis of employee job satisfaction. *International Journal of Smart Business and Technology*, 10(2), 13–22. https://doi.org/10.21742/IJSBT.2022.10.2.02

Engelen, A., Schmidt, S., Strenger, L., & Brettel, M. (2014). Top management's transformational leader behaviors and innovation orientation: A cross-cultural perspective in eight countries. *Journal of International Management*, 20(2), 124–136. https://doi.org/10.1016/j.intman.2013.04.003

Faraj, S., & Yan, A. (2009). Boundary work in knowledge teams. *Journal of Applied Psychology*, 94(3), 604–617. https://doi.org/10.1037/a0014367

Flynn, G. (1995). Do you have the right approach to diversity? *Personnel Journal*, 74(10), 68–75.

Gieryn, T. F. (1983). Boundary-work and the demarcation of science from non-science. *American Sociological Review*, 48, 781–795. https://doi.org/10.2307/2095325

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/10.5465/20159573

Harandi, A., Khamseh, P. M., & Sana, S. S. (2024). Ambidextrous leadership: Emphasis on the mediating role of knowledge sharing and knowledge search. *Annals of Operations Research*, 1–33. https://doi.org/10.1007/s10479-024-06103-4

Hou, N., Peng, J., & Nie, Q. (2023). The benefits of ambidextrous leadership behavior for workplace well-being of leaders. *Current Psychology*, 42, 28783–28798. https://doi.org/10.1007/s12144-022-03900-7

Iqbal, S., Taib, C. A. B., & Razalli, M. R. (2023). Leadership styles and organizational performance: The mediating role of quality culture. *Quality Assurance in Education*, 31(4), 600–615. https://doi.org/10.1108/QAE-03-2023-0038

Jaušovec, N. (2011). Metacognition. In *Encyclopedia of Creativity*. https://doi.org/10.1016/B978-0-12-375038-9.00146-1

Jia, X., Li, W., & Cao, L. (2019). The role of metacognitive components in creative thinking. *Frontiers in Psychology*, 10, 2404. https://doi.org/10.3389/fpsyg.2019.02404

Joiner, B. (2019). Leadership agility for organizational agility. *Journal of Creating Value*, 5(2), 139–149. https://doi.org/10.1177/2394964319868321

Jones, G., Chace, B. C., & Wright, J. (2020). Cultural diversity drives innovation: Empowering teams for success. *International Journal of Innovation Science*, 12(3), 323–343. https://doi.org/10.1108/IJIS-04-2020-0042

Kafetzopoulos, D. (2022). Ambidextrous leadership: A narrative literature review. *Baltic Journal of Management*, 17(2), 206–232. https://doi.org/10.1108/BJM-01-2021-000

Kaufman, J. C., & Beghetto, R. A. (2013). In praise of Clark Kent: Creative metacognition. *Roeper Review*, 35(3), 155–165. https://doi.org/10.1080/02783193.2013.799413

Kislov, R. (2018). Selective permeability of boundaries in a knowledge brokering team. *Public Administration*, 96(4), 817–836. https://doi.org/10.1111/padm.12541

Kreitner, R., Kinicki, A., & Buelens, M. (2001). *Organizational behavior*. Irwin/McGraw-Hill.

Lan, Y., & Chen, Z. (2020). Transformational leadership, career adaptability, and work behaviors. *Frontiers in Psychology*, 10, 2922. https://doi.org/10.3389/fpsyg.2019.02922

Lee, J., Choi, D., & Cheong, M. (2023). Leader boundary-spanning behavior and employee voice behavior. *Behavioral Sciences*, 13(2), 146. https://doi.org/10.3390/bs13020146

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

Maranga, D. K. M., & Madison, D. R. D. (2017). Globalization and its implications for global leadership. *SSRN*. https://doi.org/10.2139/ssrn.2980125

Malik, A., Gupta, J., Gugnani, R., Shankar, A., & Budhwar, P. (2024). Ambidextrous leadership style and HRM practices. *Journal of Knowledge Management*, 28(5), 1366–1395. https://doi.org/10.1108/JKM-04-2023-0339

Marrone, J. A., Tesluk, P. E., & Carson, J. B. (2007). Team member boundary-spanning behavior. *Academy of Management Journal*, 50(6), 1423–1439. https://doi.org/10.5465/amj.2007.28225967

Morgeson, F. P., & Humphrey, S. E. (2006). The work design questionnaire (WDQ). *Journal of Applied Psychology*, 91(6), 1321–1339. https://doi.org/10.1037/0021-9010.91.6.1321

Mumford, M. D. (2003). Taking stock in creativity research. *Creativity Research Journal*, 15(2–3), 107–120. https://doi.org/10.1080/10400419.2003.9651403

Mumford, M. D., Mobley, M. I., Reiter-Palmon, R., Uhlman, C. E., & Doares, L. M. (1991). Process analytic models of creative capacities. *Creativity Research Journal*, 4(2), 91–122. https://doi.org/10.1080/10400419109534380

Nelly, N., Prabowo, H., Bandur, A., & Elidjen, E. (2024). Transformational leadership and lecturer performance. *International Journal of Educational Management*, 38(2), 333–354. https://doi.org/10.1108/IJEM-06-2023-0275

Pace, F., Ingusci, E., Signore, F., & Sciotto, G. (2021). HRM practices and extra-role behaviors. *Sustainability*, 13(16), 8803. https://doi.org/10.3390/su13168803

Perrow, C. (1967). A framework for the comparative analysis of organizations. *American Sociological Review*, 32, 194–208. https://doi.org/10.2307/2091811

Pieterse, A. N., Van Knippenberg, D., Schippers, M., & Stam, D. (2010). Leadership and innovative behavior. *Journal of Organizational Behavior*, 31(4), 609–623. https://doi.org/10.1002/job.650

Pincus, J. D. (1986). Communication satisfaction and job performance. *Human Communication Research*, 12(3), 395–419. https://doi.org/10.1111/j.1468-2958.1986.tb00084.x

Probst, G., Raisch, S., & Tushman, M. L. (2011). Ambidextrous leadership challenges. *Organizational Dynamics*, 40(4), 326–334. https://doi.org/10.1016/j.orgdyn.2011.07.010

Puccio, G. J. (2002). *Foursight: The breakthrough thinking profile*. THinc Communications.

Rabl, T., del Carmen Triana, M., Byun, S.-Y., & Bosch, L. (2020). Diversity management efforts as ethical responsibility. *Journal of Business Ethics*, 161(3), 531–550. https://doi.org/10.1007/s10551-018-3849-7

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

Rožman, M., Tominc, P., & Štrukelj, T. (2023). Strategic talent management and agility. *Global Journal of Flexible Systems Management*, 24(3), 373–393. https://doi.org/10.1007/s40171-023-00344-1

Rosing, K., Frese, M., & Bausch, A. (2011). Ambidextrous leadership. *The Leadership Quarterly*, 22(5), 956–974. https://doi.org/10.1016/j.leaqua.2011.07.014

Rosing, K., & Zacher, H. (2023). Ambidextrous leadership review. In *Handbook of Organizational Creativity* (pp. 51–70). https://doi.org/10.1016/B978-0-323-91841-1.00013-0

Schraw, G., & Dennison, R. S. (1994). Assessing metacognitive awareness. *Contemporary Educational Psychology*, 19(4), 460–475. https://doi.org/10.1006/ceps.1994.1033

Tripathi, S. (2021). Determinants of digital transformation in the post-COVID-19 business world. *IJRDO Journal of Business Management*, 7(6), 75–81. https://doi.org/10.53555/bm.v7i6.4312

Tushman, M. L., & O'Reilly, C. A. (1996). Ambidextrous organizations. *California Management Review*, 38(4), 8–29. https://doi.org/10.2307/41165852

Usman, M., Ghani, U., Islam, Z. U., Gul, H., & Mahmood, K. (2022). Ambidextrous leadership and innovative work behaviors. *Journal of Public Affairs*, 22(1), e2321. https://doi.org/10.1002/pa.2321

Wang, S., Eva, N., Newman, A., & Zhou, H. (2021). Ambidextrous leadership and innovation. *Asia Pacific Journal of Management*, 38, 1305–1326. https://doi.org/10.1007/s10490-020-09714-0

Zhang, Z., & Li, R. (2023). Boundary-spanning behavior and creative performance. *Journal of Management & Organization*, 1–17. https://doi.org/10.1017/jmo.2023.51