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Management

**The role of unit and individual ambidexterity in enhancing employee task
performance: The moderating effect of cross-training**

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Abstract

Purpose

Organizational ambidexterity is a mature research topic with ongoing practical interest. However, we have limited evidence and a poor understanding of the multilevel (top-down) mechanisms that help organizations balance innovation and efficiency. Thus, we examined how unit ambidexterity (adaptability versus alignment) affects individual ambidexterity (exploratory vs. exploitative tasks) and employee task performance, emphasizing cross-training (multi-role skill) as a boundary condition.

Design/methodology/approach

This study is based on a multisource, three-wave field survey conducted across 67 Croatian organizations. Dyadic responses were collected from two levels of analysis: unit ($N = 259$ managers) and individual ($N = 816$ employees). Multilevel (moderated) mediation analyses were performed using the MLmed macro for SPSS to test the hypothesized relationships.

Findings

Results confirmed that unit ambidexterity has a positive top-down influence on individual ambidexterity and task performance. Furthermore, individual ambidexterity was found to mediate the positive relationship between unit ambidexterity and task performance. Contrary to expectations, the strength of this cross-level indirect effect weakened under conditions of high cross-training, suggesting that excessive cross-training in ambidextrous environments reduces individual performance outcomes.

Originality/value

This study advances ambidexterity research by illustrating the cascading (top-down) effects of ambidexterity on performance outcomes and highlighting cross-training as a subtle boundary

condition. It also contributes to the innovation management literature by demonstrating how multilevel ambidextrous processes and cross-training, as a new human resource practice, jointly influence bottom-line (employee) performance. The findings provide new insights into nested paradoxes and practical guidance for managing the paradoxical demands of innovation and efficiency in high-performing units.

Keywords: multilevel ambidexterity, cross-training, task performance, contextual ambidexterity, paradox theory

The role of unit and individual ambidexterity in enhancing employee task performance:

The moderating effect of cross-training

INTRODUCTION

Modern organizations face a significant challenge: leveraging their existing strengths to effectively explore new opportunities. Therefore, managers must possess the paradoxical ability known as ambidexterity (O'Reilly and Tushman, 2008) to balance innovation and efficiency. Over the past three decades, managing ambidexterity has become a central theme in organizational research. Whereas earlier approaches—mainly focused on ambidexterity as an organizational-level issue—have stressed the structural and temporal separation of exploration and exploitation (Tushman and O'Reilly, 1996), modern perspectives emphasize the importance of contextual ambidexterity. The latter approach empowers individuals (e.g., Rosing and Zacher, 2017) and teams (e.g., Gibson and Birkinshaw, 2004) to shift dynamically between competing demands. Influenced by paradox theory (Smith and Lewis, 2011), contemporary studies emphasize that balancing these tensions manifests at multiple levels. The urgent question is no longer whether the ambidexterity paradox matters but how organizations can master conflicting innovation and efficiency requirements at the unit and individual levels to thrive in an increasingly dynamic world.

This study examines contextual ambidexterity through the lens of paradox theory (Papachroni *et al.*, 2014), investigating how the multilevel interplay between collective and individual exploration–exploitation practices influences employees' task performance. Specifically, we explore whether individual ambidexterity (i.e., an employee's ability to flexibly switch between exploratory and exploitative tasks within a work role; Kaupila and Tempelaar, 2016) mediates the positive top-down relationship between unit ambidexterity (i.e., the collaborative management of alignment- and adaptation-oriented tasks within teams;

Gibson and Birkinshaw, 2004) and individual task performance (i.e., the completion of assigned tasks and job responsibilities; Bafort and Hattrup, 2003).

Our research differs from the mainstream (i.e., single-level and microfoundational research) by adopting the nested view of ambidexterity (Birkinshaw and Gupta, 2013), which suggests that lower organizational levels play a crucial role in managing strategic tensions between innovation and efficiency (Papachroni *et al.*, 2016). This does not mean that ambidexterity should be ignored in the boardroom. It is more important than ever to set ambidextrous goals, structure the ambidextrous organization, and practice ambidextrous leadership. However, a high-level focus on ambidexterity should be continued collectively and individually throughout the organization (Tarba *et al.*, 2020).

We propose that individual ambidexterity acts as a central mechanism linking unit ambidexterity to positive employee work outcomes. This reasoning aligns with paradox theory (Smith and Lewis, 2011) and the concept of contextual ambidexterity (Gibson and Birkinshaw, 2004). Furthermore, our multilevel mediation (2-1-1) framework adopts a process perspective on ambidexterity, favoring path-dependent approaches to paradox management (Raisch and Zimmermann, 2017). We expect that an ambidextrous pattern of unit-level actions will translate into a subsequent pattern of individual ambidexterity actions, ultimately leading to improved task performance among employees.

Additionally, by understanding the logic of human capital resources, we go beyond traditional on-the-job training and examine the role of cross-training as a boundary condition. Cross-training (i.e., a human development strategy in which “each team member is trained on the tasks, duties, and responsibilities of his or her fellow team members,” cf. Volpe *et al.*, 1996, p. 87) is expected to increase skill variety and flexibility (Asif and de Vries, 2015). It may help reduce the cognitive strain often associated with excessive ambidexterity demands (Jia *et al.*,

2024). We expect that cross-training will complement unit ambidexterity by promoting individual ambidexterity, thereby indirectly enhancing bottom-line (employee) performance.

To test our hypotheses, we conducted a time-lagged, multisource, multilevel field study involving 259 managers and 816 employees from 67 Croatian organizations. This design allowed us to examine the proposed cross-level relationships between unit ambidexterity and individual task performance over time. Our study advances multilevel ambidexterity research and provides new insights into the contextual ambidexterity stream by clarifying how unit and individual ambidexterity jointly influence work outcomes. It also extends paradox theory by addressing the performance implications of managing competing demands through cross-training. We highlight cross-training as a potentially valuable unit-level resource for managing the demands of ambidexterity. What emerged is that this human resource management (HRM) practice can compensate for a lack of individual ambidexterity. However, excessive cross-training in highly ambidextrous environments may lead to unexpected diminishing returns.

THEORY AND HYPOTHESES

A multilevel perspective of the ambidexterity paradox in organizations

Ambidextrous organizations manage internal tensions between exploration and exploitation across multiple levels. This multilevel perspective views ambidexterity as a system-wide paradoxical capability initiated and planned at the top, developed in the middle, and executed at the bottom of the organizational pyramid. It characterizes organizations that align dual strategies of innovation and efficiency, activities, or behaviors across various layers—specifically, the organizational (or system), team (or unit), and employee (or individual) levels. Multilevel ambidexterity suggests that partial or isolated ambidextrous efforts are unlikely to succeed. Instead, the exploration and exploitation polarities must be consistently represented throughout the organization.

Several approaches to managing the ambidexterity paradox have been developed (Lavie *et al.*, 2010), mainly focusing on two strategies: (1) structural ambidexterity at the organizational level (e.g., specialized, separate units designed for exploration and exploitation); and (2) contextual ambidexterity at the unit and individual levels (e.g., ambidextrous teams formed where team members are expected to handle both adaptive or exploratory and alignment or exploitative tasks). These strategies ensure that exploration and exploitation reinforce each other rather than compete. We chose the latter approach, highlighting cases of innovation–efficiency tensions at the unit and individual levels. We recognized that contextual ambidexterity—characterized by ambidextrous leadership and behavioral integration—is preferable to the structural alternative in an age of uncertainty. Specifically, when increased exogenous and endogenous uncertainty is effectively managed through routinized and emergent individual-level action patterns, task performance is expected to improve (Griffin and Grote, 2020).

To set the stage, at a higher level of abstraction, we define unit (also called team or harmonic) ambidexterity as “behavioral capacity to simultaneously demonstrate dap alignment and adaptability across an entire business unit” (cf. Gibson and Birkinshaw, 2004, p. 209). At a lower level of abstraction, individual or employee ambidexterity is defined as “a set of behaviors through which employees alternate between or integrate exploratory and exploitative activities over time” (Fourne *et al.*, 2019, p. 568). These paradoxical constructs have recently been examined together within the microfoundations movement (Pertusa-Ortega *et al.*, 2021), indicating the emergent process through which lower-level (i.e., individual) ambidexterity shapes upper-level (i.e., unit) ambidexterity. Although previous work is informative and valuable, existing microfoundational studies have limitations. For instance, Harris and Wood (2020) conducted a qualitative case study within the specific industry setting. Furthermore, Sallas-Vallina *et al.* (2023) based their research on a student sample. Finally, Mom *et al.* (2019)

examined a distal relationship between the individual (i.e., the managerial rather than the employee) and organizational ambidexterity in a non-Western context.

Contrary to the emphasized and valuable bottom-up perspective, our study favors a mandated (top-down) approach to examining the ambidexterity–performance relationship. Although we acknowledge the crucial role of individuals in supporting the organizational transition toward ambidexterity, we also believe that managers should bear primary responsibility for managing the ambidexterity paradox within organizations (Heyden *et al.*, 2017). This viewpoint is based on understanding individual ambidexterity as a form of job enrichment (Moccia *et al.*, 2025), where higher-level decisions and contextual influences shape job design (Parker *et al.*, 2025). Supporting evidence for a top-down relationship between unit and individual ambidexterity (though within a specific educational setting) was reported by Chang *et al.* (2016). Therefore, we similarly expect managers to initiate and establish ambidexterity goals, define the organizational context (i.e., introduce ambidexterity-fostering structures and processes; Ceptureanu *et al.*, 2025), and coordinate ambidextrous efforts (i.e., by assigning and balancing alignment and adaptability tasks at the unit level). This cross-level direct relationship between unit and individual ambidexterity is essential for understanding how this multilevel paradox phenomenon is enacted within organizations. Table I. summarizes existing quantitative research efforts on top-down and bottom-up multilevel ambidexterity.

Insert Table I. about here

Unit ambidexterity and task performance

Scholars have identified a homologous relationship between ambidexterity and performance, as evidenced by positive reports of ambidexterity–performance relationships at the

organizational (e.g., Junni *et al.*, 2013), unit (e.g., Jansen *et al.*, 2012), and individual (Ceptureanu *et al.*, 2025) levels. However, confirmed single-level relationships do not necessarily imply similar linkages across multiple levels. We should be careful not to fall into the trap of ecological fallacy (Molina-Azorin *et al.*, 2019; Lemoine *et al.*, 2025) and generalize that a relationship observed at the unit level also applies to individuals within that unit (e.g., each job is ambidextrous within ambidextrous units).

We propose that unit ambidexterity (e.g., customer teams responsible for both selling and servicing) can enhance employees' task performance. This unit-level paradox creates a context that promotes cognitive flexibility and broadens individuals' focus. For instance, cross-selling can motivate salespeople to enhance their sales efforts and increase customer value (Johnson and Friend, 2015). Similarly, delivering customer service ensures consistent quality and efficiency in work (Jasmand *et al.*, 2012). Together, unit adaptability and alignment provide leadership and resources, introduce process alternatives, and foster positive organizational behaviors (Jansen *et al.*, 2009). Consequently, employees working in ambidextrous units—even if they do not have ambidextrous tasks—should perform better if they begin perceiving exploration and exploitation as complementary (Miron-Spector *et al.*, 2011). They may find it easier to follow their ambidextrous managers and engage in contextual ambidexterity, enabling them to quickly adapt to shifting priorities and new task requirements while maintaining efficiency, ultimately improving task performance.

In ambidextrous roles, where customized service and standardized sales delivery pressures coexist, employees are more likely to perform at their best. Building on these psychological mechanisms and structural patterns (Jansen *et al.*, 2006), as well as acknowledging previous findings that demonstrate how ambidextrous leadership affects employees' task performance (Slåtten *et al.*, 2023), we propose the following hypothesis:

Hypothesis 1. Unit ambidexterity is positively related to task performance.

The mediating role of individual ambidexterity

In addition to capturing the cross-level direct effect of unit ambidexterity on task performance, we believe this influence also unfolds through a subtle cross-level indirect path. At the forefront, when organizational units consistently support both innovation and efficiency, an ambidextrous job setting is more likely to be cultivated. For salespeople, this means employees may be encouraged to practice ambidextrous behaviors as their customer teams adapt and align with one another. This cross-level isomorphism promotes a sense of consistency, as the design of tasks at the job level generally remains stable at the unit level.

Our systematic review shows that unit and individual ambidexterity are rarely studied together. For instance, Zhang *et al.* (2022b) and a few others introduced both levels of ambidexterity in their research. However, they did not analyze their causal relationship or report on their cross-level association. Nonetheless, we find early evidence supporting the cross-level ambidexterity link based on proxy measures. Shiue *et al.* (2021) suggested that sales teams with highly developed absorptive capacities may practice service-sales (individual) ambidexterity. Additionally, Slåtten *et al.* (2023) showed that ambidextrous leadership practiced by unit leaders plays a key role in fostering individual ambidexterity. Indeed, managers who effectively balance their explorative (innovation-focused) and exploitative (efficiency-focused) behaviors not only serve as role models (Zhang *et al.*, 2022a) but are also more likely to design dual-focused jobs, provide clear guidance, allocate resources efficiently, establish work group norms, and offer support that encourages employees to refine existing processes while exploring new opportunities and ideas. Furthermore, Pertusa-Ortega *et al.* (2021) indicated that employees are more likely to internalize and reflect on exploration and exploitation when their organizational units enable and reward ambidextrous behaviors.

Therefore, as Birkinshaw and Gupta (2013) do, we view ambidexterity as a nested concept. This notion is further supported by paradox theory and the work of Panayiotou *et al.* (2019), who argued that tensions at higher levels are passed down to lower levels. Specifically, when individuals are part of ambidextrous units, they are more likely to view exploration and exploitation as compatible rather than mutually exclusive (Miron-Spektor *et al.*, 2011). This contextual influence makes individual ambidexterity practically achievable and can serve as a foundation for fostering paradoxical thinking and action at the individual level. Thus, we propose the following:

Hypothesis 2. Unit ambidexterity is positively related to individual ambidexterity.

A positive relationship between ambidexterity and performance at the individual level has been recently established (e.g., Ceptureanu *et al.*, 2025). When employees demonstrate ambidextrous behavior, they are likely to perform their jobs effectively and achieve higher task performance. However, what remains unclear—and has yet to be empirically tested—is whether individual ambidexterity serves as a mediating variable that influences individual work outcomes initially affected by unit ambidexterity.

To the best of our knowledge, existing research has not examined how the interplay between work exploration and exploitation acts as a potential job design mechanism that converts unit ambidexterity into employees' task performance. However, a study by Slåtten *et al.* (2023)—though based on somewhat different independent (i.e., ambidextrous leadership) and dependent variables (i.e., creativity)—suggested that individual (i.e., employee) ambidexterity mediates the relationship. Motivated by their preliminary findings, we argue that a cross-level direct relationship between unit ambidexterity and task performance can be clarified and further improved by exploring the underlying individual-level ambidexterity mechanism.

Furthermore, building on similar ambidexterity studies (e.g., Schnellbacher *et al.*, 2019), we argue that social and cognitive mechanisms may act as mediators, translating structural intentions into individual actions. This investigation holds significant potential, as ambidextrous job design provides an excellent opportunity to further enhance the cross-level relationship between unit ambidexterity and individual performance. Our argument also relies on paradox theory, which posits that tensions (e.g., ambidexterity) should be managed concurrently across multiple levels (Smith and Lewis, 2011). This approach enables both ambidextrous unit structures and ambidextrous job designs to align their beneficial impact on employee work outcomes.

Creating an ambidextrous unit environment not only promotes structural efficiency but also establishes the psychological conditions needed for employees to develop ambidextrous behavior—the ability to switch dynamically between exploration and exploitation—to meet changing demands. Because unit ambidexterity operates as a collaborative, interdependent process (Jorgensen and Becker, 2017), each employee is expected to demonstrate ambidexterity within this structured setting, which will influence their individual contribution. Therefore, individual ambidexterity may serve as an important mediating mechanism through which unit ambidexterity can indirectly impact employees' task performance. Based on this rationale, we suggest the following:

Hypothesis 3. Individual ambidexterity mediates the positive relationship between unit ambidexterity and task performance.

The moderating effect of cross-training

Employees are primarily assigned and trained to perform their specific job functions. For example, sales development representatives create innovative strategies to generate sales and identify potential customers. In contrast, sales representatives are trained to negotiate prices

effectively, prepare sales contracts, and handle transactions. Both sales roles can enhance their performance by gaining a deeper understanding of the responsibilities of other team members involved in the customer process. Additionally, they may feel more motivated and engaged if they understand the order fulfillment process.

Kostopoulos *et al.* (2015) pioneered the study of HRM practices as potential cross-level boundary conditions for multilevel ambidexterity. Recent evidence indicates that ambidextrous HRM practices play a vital role and act as key antecedents of individual ambidexterity (Jyoti and Chaoudhary, 2024) and innovation performance (Zhang *et al.*, 2022a). We also highlight that cross-training (i.e., a type of team training that enables employees to develop skills and knowledge in performing tasks beyond their primary roles) may be important in ambidextrous team settings (Burkert and Grossrieder, 2025).

Cross-training fosters versatile behaviors by enabling employees to transition between exploratory and exploitative work activities, thereby enhancing adaptability and operational efficiency (Hopp and Van Oyen, 2004). It is expected to serve as a valuable job resource, with positive implications for work outcomes (Bakker *et al.*, 2023; Ellis and Pearsall, 2011), particularly when ambidextrous demands are high (Jyoti and Choudhary, 2024). It aligns with the principles of contextual ambidexterity (Gibson and Birkinshaw, 2004) and job demands–resources (JD–R) theory (Bakker *et al.*, 2023). Employees who must attain optimal performance by simultaneously engaging in high levels of both work exploration and exploitation may face conflicting task demands (Bledow *et al.*, 2009). However, if cross-trained, they can alleviate tensions or meet the increased demands for ambidexterity imposed by their managers.

Based on these perspectives, the present study suggests that cross-training serves as a contextual factor that moderates the positive relationship between unit ambidexterity and task performance, viewed through the lens of individual ambidexterity. Specifically, similar to Ellis and Pearsall (2011), we first assume that cross-training, as a unit-level resource, will enhance

the positive impact of unit ambidexterity on individual ambidexterity. In the highly demanding work environment of ambidextrous units, a cross-trained workforce provides essential flexibility and helps reduce uncertainty. Managers can pursue role integration (i.e., assigning ambidextrous tasks to any employee) rather than role segmentation (i.e., assigning specialized tasks only to a few employees), thereby increasing ambidexterity tensions across levels (Jarzabkowski et al., 2013). However, without cross-training, if employees in ambidextrous units are still expected to perform their formal job tasks, the potential for unit adaptability and improvisation decreases. In other words, not being cross-trained does not prevent employees from managing both exploratory and exploitative tasks. However, the opportunities to design individual ambidextrous task assignments for the entire workforce and achieve desirable unit-level flexibility gains are limited.

Furthermore, the positive relationship between unit and individual ambidexterity—especially when employees are cross-trained—should enhance task performance by enabling them to manage both exploratory and exploitative tasks. However, if an organizational unit fails to implement a cross-training program, employees may face an imbalance in job design. They will be required to handle high-stress jobs with excessive ambidexterity demands and limited training resources. Therefore, we hypothesize as follows:

Hypothesis 4. Cross-training moderates the positive relationship between unit ambidexterity and task performance, such that the indirect effect of individual ambidexterity is more substantial when employees are cross-trained.

Insert Figure 1 about here

METHOD

Sample

We collected nested and time-lagged responses from a multisector sample of Croatian organizations (20.9% manufacturing, 13.4% wholesale and retail, 11.9% information and communication, 10.4% transport and logistics, and 10.4% finance and insurance) using online questionnaires via SurveyMonkey. We used a snowball sampling strategy to gather a convenient sample of 259 managers, 816 employees, and 67 organizational representatives. Primary organizational contacts were asked to provide the email addresses of five department heads (i.e., managers) and five direct reports per unit (i.e., employees), without specifying hierarchical levels. We achieved acceptable response rates (Baruch and Holtom, 2008) of 80.8% at the unit level and 76.6% at the employee level.

After collecting the data, we used two specific inclusion criteria to ensure unbiased estimates (Hinds and Mortensen, 2005): (1) each organization must have at least two complete unit records; and (2) each organization needs to provide at least four complete records of manager–employee interactions. We also excluded employees who had been in their current roles for less than six months when analyzing the data. The independent-samples *t*-tests revealed no evidence of bias due to exclusion criteria (no significant differences were found between unit- or individual-level variables). Therefore, our final nested dataset included dyadic responses from 203 managers and 685 direct reports, with nearly two-thirds (65.2%) having between two and four employees per manager.

On average, we analyzed 5.529 units per organization ($SD = 3.709$), with a modal value of five. We covered both divisional (line) and corporate function (staff) units equally. Most units were positioned hierarchically one (53.0%) or two (28.9%) levels below the CEO. Employees, as individual-level respondents, came from diverse backgrounds. Nearly two-thirds of our sample were women (62.7%). We mainly collected data from individuals aged 35 to 45 ($M = 39.499$, $SD = 10.487$). Half of the employee respondents were university educated (50.9%) and

had nearly a decade of job experience ($M = 8.793$, $SD = 8.345$). Our individual-level respondents mainly worked as clerical staff (34.8%) or professionals (26.9%), but middle- and low-level managers also significantly participated in the research (26.4%). Detailed sample characteristics are shown in Table II.

Insert Table II. about here

Measures

Managers conducted unit-level survey assessments while employees filled out individual-level structured questionnaires to gather perceptual (self-report) data at three intervals spaced three months apart. The primary constructs of the study were examined at different analytical levels using multi-item, five-point Likert-type agreement scales (1 – strongly disagree; 5 – strongly agree) or frequency scales (1 – never; 5 – always). Before distributing the surveys, the measurement instruments were translated and back-translated into the respondents' native language. Data collection began with employees self-reporting their perceptions of individual ambidexterity (the mediating variable at Time 2). Three months later, managers completed the unit questionnaire, which included retrospective measures (independent variables at Time 1) and current metrics (dependent variable at Time 3). Retrospective measures were employed as an effective strategy for enhancing the research process and increasing the response rate (Miller et al., 1997). Our six-month time frame matches that used by Zhang *et al.* (2022a) in their multilevel ambidexterity research.

Ambidexterity. A two-step method (Gibson and Birkinshaw, 2004) was employed to assess ambidexterity constructs at both the unit and individual levels. Initially, exploration (innovation) and exploitation (efficiency) options were treated as orthogonal manifest variables,

which are opposing yet interdependent and complementary (He and Wong, 2004). In evaluating their unit characteristics, managers reflected on the prior six months (representing Time 1). They assessed unit ambidexterity, with each unit design type comprising three ordinal agreement items derived from Gibson and Birkinshaw (2004). An example of a unit adaptability item (exploration) is “The management systems in this organization evolve rapidly in response to shifts in our business priorities” ($\alpha = .686$; after item deleted). In contrast, an example of a unit alignment item (exploitation) is, “The management systems in this organization work coherently to support the overall objectives of our organizational unit” ($\alpha = .713$).

Unit-level confirmatory factor analysis (CFA) removed a questionable ordinal manifest item from the unit adaptability scale. Next, the remaining unit-level items were averaged and transformed into first-order continuous values to calculate the second-order latent continuous scores of unit ambidexterity, represented as the multiplicative interactions of adaptability and alignment (Kostopoulos *et al.*, 2015). This measurement approach builds on established practices from foundational research on unit ambidexterity (Gibson and Birkinshaw, 2004).

The same procedure was utilized to measure individual ambidexterity. In the individual questionnaire, employees self-assessed the frequency of innovative (i.e., work exploration) and routine (i.e., work exploitation) tasks in their job positions using four-item ordinal scales for each subdimension, as introduced by Schnellbacher *et al.* (2019). An example of a work exploration item is “I am involved in work activities requiring you to learn new skills or knowledge” ($\alpha = .645$). In contrast, an example item for work exploitation is, “I am involved in work activities of which it is clear to you how to conduct them” ($\alpha = .734$). Individual-level CFA confirmed adequate factor loadings (above .60) for each original ordinal manifest item, allowing us to establish the corresponding first- (i.e., work exploration and work exploitation) and second-order continuous latent variables (i.e., individual ambidexterity).

Cross-training. The increasing interest in team training to promote ambidexterity (Jorgensen and Becker, 2017) and the importance of cross-training for individual performance (Hernaus *et al.*, 2021) led us to investigate this effective work practice. Managers assessed the level of cross-training implemented within their units at Time 2. We modified a four-item scale from Cua *et al.* (2001) by slightly rephrasing the items to better fit the unit-level context. An example item is “My employees are cross-trained so they can fill in for others if necessary” ($\alpha = .674$). Unit-level CFA revealed a low factor loading for an ordinal reverse-scored manifest item, prompting us to remove it from the first-order latent construct. As a result, the scale’s reliability improved ($\alpha = .750$).

Task performance. The outcome variable represented a subjective evaluation of employees’ in-role performance, as assessed by their direct supervisors. At Time 3, managers rated each sampled employee’s task performance using a four-item scale developed by Liden *et al.* (1993). An example of an ordinal-scale manifest item is, “The overall level of performance that I have observed for this employee is outstanding” ($\alpha = .906$).

Control variables. The selection of covariates for the current multilevel research model was based on theoretical principles and aligned with best-practice guidelines (Bernerth and Aguinis, 2016). By default, unit- and individual-level controls were centered around the group mean in MLmed (Rockwood, 2019), allowing us to distinguish between unit- and within-unit effects. At the unit level, we assessed unit size (a single reverse five-point Likert-style agreement item: “The number of people in my team is too small for the work to be accomplished”) and unit level (measured using the following item: “Where is your unit positioned within the hierarchy?”). Additionally, team cohesion (i.e., a collective tendency to work together and stay united in pursuing common goals) was included. The first two covariates—size and hierarchical position—represent the most commonly utilized controls in previous ambidexterity–performance research (e.g., Jansen *et al.*, 2012). Team cohesion,

operationalized by adopting a 6-item Likert-type agreement scale (a sample item is “The members of my work group are cooperative with each other,” $\alpha = .929$) developed by Podsakoff and MacKenzie (1994), was selected as a noted precursor to team performance (Grossman *et al.*, 2022). The individual controls included education (with six educational categories), organizational tenure (the duration of employment within the organization), and paradox mindset (i.e., “a tendency to value, accept, and feel comfortable with tensions,” cf. Miron-Spector *et al.*, 2018, p. 34). The latter was measured using a 9-item Likert-type agreement scale created by Miron-Spektor *et al.* (2018). An example ordinal manifest item is: “I am comfortable dealing with conflicting demands at the same time” ($\alpha = .821$). However, we had to exclude one original item with a low factor loading after conducting individual-level CFA.

Analytical procedure

CFAs using the weighted least squares estimator in JASP version 0.16.3.0 were conducted to assess the validity and reliability of the measures. The proposed individual-level three-factor model (i.e., work exploration, work exploitation, and task performance) demonstrated a better fit ($\chi^2[N = 685, df = 51] = 291.446$, $\chi^2/df = 5.715$, TLI = .973, CFI = .979, RMSEA = .084, SRMR = .079) compared to the alternative models, including a two-factor model of individual ambidexterity and task performance ($\chi^2[N = 685, df = 53] = 705.060$, $\chi^2/df = 13.303$, TLI = .929, CFI = .943, RMSEA = .136, SRMR = .176) and a single-factor model ($\chi^2[N = 685, df = 54] = 1371.912$, $\chi^2/df = 25.406$, TLI = .859, CFI = .885, RMSEA = .191, SRMR = .360). Furthermore, the proposed unit-level three-factor model (i.e., unit adaptability, unit alignment, and cross-training) also exhibited a good fit ($\chi^2[N = 203, df = 17] = 55.398$, $\chi^2/df = 3.259$, TLI = .887, CFI = .932, RMSEA = .107, SRMR = .087) in comparison to the alternative models, which included a two-factor model of unit ambidexterity and cross-training ($\chi^2[N = 203, df = 19] = 109.788$, $\chi^2/df = 5.778$, TLI = .762, CFI = .838, RMSEA = .155, SRMR = .168) and a

single-factor model ($\chi^2[N = 203, df = 20] = 137.877$, $\chi^2/df = 6.894$, TLI = .706, CFI = .790, RMSEA = .173, SRMR = .188). The factor loadings for the assessed individual- and unit-level constructs (see Table III.) were all above the recommended threshold of .50 (Hair *et al.*, 2019). Moreover, the average variance extracted values were above .50, with an acceptable exception for the work exploitation measure (AVE = .462), which was compensated (see Fornell and Larcker, 1981) by a sufficiently high (> .60) composite reliability (McDonald's omega = .653). Thus, our data meet the minimal requirements of convergent validity.

 Insert Table III. about here

The nested observational data structure further required estimating variance partitioning between and within units. The ICC(1) values were .241 for work exploration, .270 for work exploitation, and .310 for task performance. Additionally, the ICC(2) values were .515 for work exploration, .554 for work exploitation, and .601 for task performance. All calculated ICC(1) and ICC(2) values fell within acceptable thresholds for multilevel organizational research (Biemann *et al.*, 2012).

To assess the proposed multilevel predictions, we utilized MLmed Beta 2 (Rockwood, 2019). This SPSS macro enabled us to progressively test our multilevel moderated mediation model using the maximum likelihood estimator. Initially, we evaluated a multilevel mediation model (2-1-1) without any control variables. Subsequently, we incorporated both unit- and individual-level covariates. Next, we added a first-stage unit-level moderator (cross-training) to the hierarchical linear modeling equation. Finally, we performed robustness checks for the multilevel conditional process model, employing an alternative operationalization of the second-order latent variables. Figure 2 summarizes the research process steps and methodological choices made in the present study.

Insert Figure 2 about here

RESULTS

Preliminary analysis

Table IV. presents the correlation matrix, along with the means and standard deviations. Notably, the relationship between unit adaptability and alignment (i.e., unit ambidexterity: $r = .287, p = .000$), as well as the product of work exploration and exploitation (i.e., individual ambidexterity: $r = .111, p = .004$), was positively linked to task performance. We also observed a positive cross-level correlation between unit and individual ambidexterity ($r = .155, p = .029$). Interestingly, unit adaptability and alignment were significantly positively related ($r = .447, p = .000$), whereas work exploration and exploitation were negatively related ($r = -.083, p = .030$). The level-2 boundary condition of cross-training was not significantly connected to individual ambidexterity ($r = .078, p = .272$). However, it showed a positive association with unit ambidexterity ($r = .469, p = .000$) and task performance ($r = .317, p = .000$).

Insert Table IV. about here

We found no signs of multicollinearity, with the highest variance inflation factor reported at 1.302. Harman's one-factor test revealed that a single factor accounted for 21.44% of the variance, suggesting that common method bias is unlikely. The Breusch–Pagan test also showed no evidence of heteroskedasticity ($p = .062$). Additionally, we used the correlated random effects approach (Antonakis *et al.*, 2021) to assess endogeneity in our multilevel research

model. The cluster-mean term for individual ambidexterity as a mediator was an insignificant predictor of task performance ($p = .723$), suggesting no signs of endogeneity.

A multilevel mediation model without control variables was initially tested using MLmed. Data analysis revealed that unit ambidexterity has a significant cross-level direct impact on both individual ambidexterity ($b = .078, p = .012, 95\% \text{ CI } [.018, .139]$) and task performance ($b = .041, p = .000, 95\% \text{ CI } [.022, .059]$). Moreover, individual ambidexterity has a positive single-level direct effect on task performance ($b = .050, p = .019, 95\% \text{ CI } [.008, .092]$). The between-indirect effect of individual ambidexterity in the relationship between unit ambidexterity and task performance was marginally significant. However, it achieved a 95% confidence interval for 10,000 bootstrap resamples (*indirect effect* = .004, $SE = .002, p = .096, 95\% \text{ CI } [.000, .009]$).

Hypothesis testing

Theoretical assumptions were tested using a multilevel conditional process analysis that integrated a unit-level moderator with unit- and individual-level control variables into the underlying multilevel mediation model. The first hypothesis proposed a positive relationship between unit ambidexterity and task performance. In the initial multilevel mediation model, which did not include cross-training, we found preliminary support for the hypothesized cross-level direct effect, which was reaffirmed in the multilevel moderated mediation model ($b = .046, SE = .009, p = .000, 95\% \text{ CI } [.027, .064]$). Therefore, we found support for Hypothesis 1.

Next, we examined the unit's contextual influence on individual ambidexterity. The first column (Model 1a in Table V.) presents individual ambidexterity as the outcome variable within a multilevel mediation model. Unit ambidexterity was not significantly associated with individual ambidexterity at the between-units level ($b = .057, SE = .033, p = .083, 95\% \text{ CI } [-.007, .121]$). However, after incorporating cross-training as a first-stage moderator, the

multilevel moderated mediation model testing provided positive and significant evidence ($b = .348, SE = .153, p = .024, 95\% CI [.047, .649]$), thus supporting Hypothesis 2.

To test the mediating role of individual ambidexterity, we initially examined and confirmed its positive association with task performance ($b = .055, SE = .021, p = .008, 95\% CI [.015, .096]$) at the between-units level (Model 2a in Table V.). The cross-level indirect effect of unit ambidexterity on task performance through individual ambidexterity was nonsignificant (*indirect effect* = .003, $SE = .002, p = .163, 95\% CI [-.000, .008]$) in the multilevel mediation model. However, we found marginal mediating evidence in the multilevel moderated mediation model (Model 2b in Table V.). Specifically, in addition to a significant cross-level direct effect of unit ambidexterity on task performance, the between-indirect effect was marginal (*conditional indirect effect* = .019, $SE = .011, p = .096, 95\% CI [.001, .046]$), indicating the possibility of partial multilevel mediation under certain boundary conditions. In other words, we conditionally accepted Hypothesis 3.

Insert Table V. about here

The final hypothesis suggested that cross-training moderates the cross-level indirect relationship between unit ambidexterity and task performance, with individual ambidexterity serving as an individual-level mediator. Model 2b in Table V. presented puzzling findings. When cross-training is introduced as a first-stage unit-level moderator in the multilevel mediation model, the direct effect of individual ambidexterity on task performance remains stable, as does the cross-level direct effect of unit ambidexterity on individual-level performance outcomes. Meanwhile, the between-index of moderated mediation—the boundary condition of cross-training on the relationship between unit and individual ambidexterity—appeared unexpectedly negative (*effect* = -.004, $95\% CI [-.011, -.001]$). Beyond indicating that

cross-training is a significant moderator, this raised the possibility of a compensatory effect between unit ambidexterity and cross-training (see Figure 3).

Further testing the complete multilevel conditional process model revealed that the indirect effect of unit ambidexterity on task performance, mediated by individual ambidexterity, was positive and marginally significant (*conditional indirect effect* = .019, *SE* = .012, *p* = .096, 95% CI [.001, .046]). For high values of cross-training (+ 1 SD), the conditional indirect effect was adverse and nonsignificant (*effect* = -.001, *SE* = .003, *p* = .725, 95% CI [-.007, .004]); for low values of cross-training (- 1 SD), the conditional indirect effect was nonsignificant in terms of *p*-value (*effect* = .005, *SE* = .003, *p* = .122, 95% CI [.000, .013]), even though zero was not within the 95% bootstrap confidence interval. However, these results were insufficient to support our claim and reinforce Hypothesis 4.

The unit and individual controls examined in our multilevel conditional process model were selectively relevant. Specifically, unit size and team cohesion significantly contributed to explaining task performance. Undersized units (*b* = .097, *SE* = .036, *p* = .008, 95% CI [.025, .169]) and cohesive teams (*b* = .203, *SE* = .088, *p* = .022, 95% CI [.030, .377]) were associated with higher task performance. Similar results were observed for educational level and organizational tenure. Highly educated (*b* = .189, *SE* = .058, *p* = .001, 95% CI [.075, .303]) and long-tenured (*b* = .013, *SE* = .006, *p* = .038, 95% CI [.001, .026]) employees appeared to be higher in-role performers.

Insert Figure 3 about here

Supplementary analysis

We conducted a post hoc analysis to verify the stability of our estimates when using an alternative operationalization of second-order latent variables. In addition to our original interaction-term approach ($A \times B$), ambidexterity constructs were calculated as additive measures ($A + B$), similar to the work of He and Wong (2004). The study findings (see Table V.) remained consistently significant (i.e., *the between-index of moderated mediation* = -.016, 95% CI [-.038, -.000]; *the conditional indirect effect* = .068, $SE = .041$, $p = .094$, 95% CI [.005, .163]), again confirming our hypotheses.

DISCUSSION

The current multilevel (multisource and three-wave) field research study found support for significant direct and indirect effects of ambidexterity on performance. The direct cross-level effect of unit ambidexterity on individual ambidexterity is positive. In contrast, the indirect effect of individual ambidexterity on the relationship between unit ambidexterity and task performance has diminished due to unintended negative consequences associated with cross-training within organizational units. These relevant and somewhat counterintuitive results are further examined from both theoretical and practical perspectives.

Theoretical implications

Our study outlines three significant contributions. First, we adopted an approach that examined ambidexterity from multiple levels, collecting survey data on exploration and exploitation from both managers and employees. The rigorous quantitative research design enabled us to gain new insights into whether unit ambidexterity boosts task performance and how individual ambidexterity may serve as an underlying mechanism for task design. The results indicated that the impact of unit ambidexterity on employees' task performance remained significant even after accounting for individual ambidexterity. In other words, we found that combining unit

alignment and adaptability with ambidextrous tasks enhances individual performance. This finding aligns with previous innovation management research demonstrating a positive cross-level relationship between organizational creativity and individual creativity (Bharadway and Menon, 2000), as well as studies showing that organizational ambidexterity mediates innovation–performance relationships under certain nonlinear conditions (Hwang *et al.*, 2021). However, the present work is unique in further validating the mediating role of individual ambidexterity, thereby enhancing the multilevel understanding of ambidexterity structures, mechanisms, and behaviors in organizations.

Second, we expanded the scope of the JD–R theory (Bakker *et al.*, 2023). To date, this flexible and widely accepted perspective on job design has not fully captured the complex nature of ambidexterity. Like Temerak *et al.* (2024), our multilevel study considers ambidexterity as a demand. A higher-level construct, consisting of unit adaptability and alignment, represents opposing strategies that require managers to organize—and employees to perform—a diverse set of exploratory and exploitative tasks (a lower-level construct). Following a contextual ambidexterity approach (Fourné *et al.*, 2019), this implies that each employee within an organizational unit is expected to manage multiple tasks of varying natures. These formal job requirements for performing exploratory (e.g., servicing) and exploitative tasks (e.g., selling) integratively define competing and intensified job demands that may lead to increased strain, role stress, and exhaustion (Gabler *et al.*, 2017).

However, in our study, unit ambidexterity demands (i.e., unit adaptability and alignment separately, as well as their multiplicative measure) were positively related to employees' task performance. Moreover, similar ambidexterity–performance relationships were found at the individual level, although some remained insignificant (i.e., work exploration and task performance). This empirical reality, to some extent, contrasts with our collective understanding of the negative performance consequences associated with similar work

stressors, such as role overload and role conflict (Gilboa *et al.*, 2008). Nevertheless, an alternative meta-analytic review (LePine *et al.*, 2005) is more favorable, suggesting that the positive effect of challenge stressors (e.g., job complexity, job scope) on individual-level performance is more likely to be observed. Therefore, we approached unit and individual ambidexterity as representing team- and job-demand challenges. Nonetheless, we also assert that further investigation into this choice is necessary, which falls outside the scope of this study.

Thirdly, we contributed to the application of JD–R in ambidexterity research by examining an underexplored contextual HRM antecedent of cross-training. Our initial stance was to classify training as a supportive condition that increases the likelihood of diverse resources emerging (Demerouti, 2025). Similar to Ellis and Pearsall (2011), we presented cross-training as a unit-level resource that was expected to positively impact employees' task performance. Building on their evidence, we assumed that cross-trained employees, as resourced individuals, would perform better in a highly demanding ambidextrous work environment. However, unexpectedly, we empirically uncovered the *negative* performance consequences of cross-training. Specifically, our data showed that highly cross-trained employees (a resourceful situation) who worked on ambidextrous tasks within ambidextrous units (a demanding situation) experienced declines in task performance. In contrast, in non-ambidextrous organizational units, cross-training practices compensated for limited departmental capabilities, leading to higher individual ambidexterity, which, in turn, resulted in higher task performance scores.

It is conceivable that sampled employees felt overwhelmed. Although a valuable job resource, cross-training required them to invest additional time and effort in learning “everything about everything,” which might lead to cognitive depletion and overload. Interestingly, a similar undermining effect has recently been showcased in several

organizational studies. For example, Gyensare *et al.* (2025) reported the unintended (adverse) boundary effect of training on the relationship between polychronicity and thriving at work through work engagement. Likewise, Yun *et al.* (2024) demonstrated in their research on creativity that providing excessive information (a proxy for training) can cognitively overload the recipient. In the aforementioned studies, including ours, a “too-much-of-a-good-thing effect” (Pierce and Aguinis, 2013) may have occurred, potentially hindering employees’ cognitive resources for managing excessively diverse tasks and ultimately impairing their performance scores.

Practical implications

The present research offers two novel recommendations for business decision-makers. First, introducing and managing ambidexterity in organizations foster the creation of a high-performing work environment. Specifically, the data indicate that employees tend to respond positively and exhibit higher in-role performance when their ambidextrous tasks are organized within ambidextrous units. Therefore, managers should be encouraged to integrate ambidexterity at various levels of analysis (i.e., unit and individual) to enhance employees’ task performance. Practically, this means that organizations can benefit the most if their customer teams incorporate distinct service and sales tasks (Jasmand *et al.*, 2012), with each salesperson regularly engaging in both task types as part of their role. However, we should be aware that such sales–service ambidexterity may increase felt stress (McClure *et al.*, 2024) and does not provide straightforward benefits (Gabler *et al.*, 2017). Instead, salespeople’s performance probably depends on whether they are overwhelmed by ambidexterity demands and whether they have access to sufficient (not excessive) information resources (Sok *et al.*, 2022).

The second piece of advice for contemporary organizations is to move beyond traditional on-the-job training and establish cross-training programs that align unit-level resources with

the demands of multilevel ambidexterity (Van der Borgh *et al.*, 2017). Following Burkert and Grossrieder (2025), we suggest investing in cross-training to enhance ambidexterity skills within organizational units. However, managers must be careful not to overdo it. For instance, if employees, such as salespeople, are required to participate in an extensive team training program to learn about ambidextrous selling and various servicing tasks—while also handling the responsibilities of executing highly demanding exploratory (e.g., providing ongoing post-sales service) and exploitative tasks (e.g., selling multiple-unit products daily)—they may encounter significant cognitive depletion and overload. This mental exhaustion, resulting from excessive demands on their cognitive resources, can impede individuals' ability to consistently perform formal tasks effectively.

Research limitations and future research

This study has its limitations. First, we did not control for occupations, job types, industries, sectors, or organizational characteristics such as centralization and size. Unfortunately, the total number of potential confounding variables in social science research models is nearly unreachable, so we must be aware of the impossibility of perfect measurement (Rucker *et al.*, 2011). Additionally, constrained by the MLmed macro functionality (i.e., which allows for the introduction of only three controls at each level of analysis), we followed the guidance on including the theoretically most meaningful controls (Bernerth and Aguinis, 2016) to ensure a minimally sufficient set of confounding variables required to identify causal effects (Hünermund and Louw, 2025). As a result, our findings and conclusions provide a novel yet limited understanding of the multilevel ambidexterity phenomenon.

Next, we found that individual ambidexterity serves as a partial mediator. This implies that other indirect effects exist (Rucker *et al.*, 2011) and likely drive the relationship between unit ambidexterity and task performance. Therefore, future research should validate and expand our

findings by examining additional structural, social, and psychological mechanisms as well as other relevant contingencies. Special attention should be directed toward exploring how work design characteristics—such as diverse profiles of job demands and resources—affect the successful implementation of contextual ambidexterity within an organization (e.g., Parker, 2014; Hoang and Lee, 2024). Likewise, it would be valuable to investigate whether and how various situational factors (beyond work design) and personal attributes (Dierdorff *et al.*, 2025) moderate, mediate, or control the ambidexterity–performance relationship. For instance, although our results indicated a significant confounding effect of the employee paradox mindset (i.e., it amplifies the unit’s influence on individual ambidexterity), we did not make it the focal point of our investigation. This, along with similar individual (e.g., ambidextrous skills), unit (e.g., ambidextrous leadership), and organizational attributes (e.g., ambidextrous culture, ambidextrous HRM), represents important areas for future investigation.

Furthermore, although our data include 203 organizational units (i.e., managers) and 685 nested individuals (i.e., employees) that meet the minimum sample size guidelines (Park and Yu, 2018) and exceed ICC thresholds (Biemann *et al.*, 2012), they still fall short of being ideal. A textbook example from educational research presents a 30/30 rule (Hox, 2010), which entails collecting at least 30 higher-level responses (e.g., classrooms) and 30 lower-level responses (e.g., students) nested within each classroom. However, this rule of thumb does not naturally apply in our case, as organizational units represent smaller collectives. Fortunately, multilevel sampling offers flexibility, as potentially biased estimates of the second-level standard errors are most likely to occur only when the higher-level sample size is 50 or fewer (Maas and Hox, 2005).

As part of the current research, we collected relatively few individual-level responses per unit. However, this shortcoming has been counterbalanced by an increase in the number of unit-level responses. Because organizational designs are consistently heterogeneous, we were

unfortunately unable to study the same business functions or divisions across the targeted organizations. Additionally, we did not meet our initial target of having at least five employees from the same organizational unit, which ultimately hindered our ability to conduct a multilevel CFA due to an error message in the R package lavaan (Kyriazos, 2019). Another sampling issue was that our unit-level data were nested within organizations (with an average of 4.46 units per organization), but we did not account for this. Future ambidexterity research should address these challenges and implement a highly complex three-level analysis to decompose sources of variance more effectively.

Moreover, the selected research method (i.e., multilevel moderated mediation) implicitly specifies the pathways and causal relationships among variables (Nguyen *et al.*, 2021). Although we developed and utilized a three-wave dataset, we cannot make strong causal inferences for several reasons. First, we employed a retrospective measure of unit ambidexterity, creating a Time 1 data point from managerial self-reports collected at Time 2, alongside a cross-training variable. Some authors have raised concerns about the validity of such retrospective assessments. We agree with critics that this method is questionable when examining psychological phenomena (Schwarz, 2012) or when using retrospective pretests (Hill, 2019). However, on the other hand, utilizing retrospective reports and reflective judgments is acceptable when researchers focus, as we and other ambidexterity scholars have done (e.g., Gibson and Birkinshaw, 2004; Jansen *et al.*, 2006), on organizational phenomena that are factual (Huber and Power, 1985), develop over time (Zimmermann *et al.*, 2018), or involve complex trade-offs (Hansen *et al.*, 2019). Second, we utilized nonexperimental data and did not introduce interventions, which represent the gold standard and the most powerful research design for establishing causality (Schmidt and Pohler, 2018). Third, Preacher (2015) argued that multilevel structural equation modeling should be the preferred approach, as it

avoids bias in the between-indirect effect that is often present when using a 2-1-1 hierarchical linear model.

Ultimately, selecting a dependent variable requires careful consideration. Sampled managers assessed the task performance of their direct reports. However, it is preferable to use objective performance metrics, though we must consider the appropriateness of each measure for addressing the topic of interest (Jordan *et al.*, 2024).

CONCLUSION

The significance of (multilevel) ambidexterity extends beyond being just another management trend; an organization's ability to explore and exploit simultaneously at different levels can be a vital differentiator in performance. Therefore, through the lens of contextual ambidexterity and paradox theory, we highlighted a top-down approach and confirmed the roles of unit and individual ambidexterity in enhancing employees' task performance. Importantly, although grounded in team- and individual-level data, our findings have broader organizational relevance: they inform how macro-level innovation systems can be supported through strategic HRM practices and structural ambidexterity. Furthermore, testing JD–R theory, we examined and revealed the intriguing (and counterintuitive) contextual nature of cross-training. This unit-level resource, offered within a highly demanding ambidextrous work environment, may lead to a “too much of a good thing” effect. As a result, managers should be cautious to avoid overwhelming their workforce with requests to be an ambidextrous jack of all trades.

CONFLICT OF INTEREST STATEMENT

The authors have no conflict of interest to declare.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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Table I. Summary of quantitative multilevel ambidexterity research studies

Authors	Research design	Sample and levels of analysis	Data analysis method	Ambidexterity measure	Main findings
Chang <i>et al.</i> (2016)	cross-sectional field survey	unit (N = 112 administrative heads) and individual (N = 522 faculty members)	multilevel mediation	multiplicative	Department ambidexterity is positively related to individual ambidexterity; both department and individual levels of research ambidexterity facilitate each departmental and individual commercial performance
Mom <i>et al.</i> (2019)	time-lagged field survey	organizational (N = 52) and individual (N = 467 operational managers)	multilevel SEM	a second-order formative latent variable	The bottom-up relationship between managerial and organizational ambidexterity is contingent on firm opportunity-enhancing HR practices
Zhang <i>et al.</i> (2022b)	two multi-wave field studies and an online cross-	Study 1: unit (N = 105) and individual (N = 562 employees); Study	multilevel path modelling	multiplicative	Paradoxical leadership has a positive indirect effect on team members' individual innovation through individual ambidexterity and a positive

	lagged panel study	2: unit (N = 93) and individual (N = 607 employees); Study 3: individual (N = 312)			indirect relationship with team innovation through team ambidexterity
Salas-Vallina <i>et al.</i> (2023)	cross-sectional field survey	unit (three-to-six team members) and individual (N = 168 students)	multilevel SEM	multiplicative	Individual ambidexterity has a positive (bottom-up) effect on team ambidexterity
Jyoti and Choudhary (2024)	cross-sectional field survey	unit (N = 176 managers) and individual (N = 212 employees)	single-level mediation and multi-group analysis	a second-order formative latent variable	Managers' ambidextrous orientation moderates the indirect relationship between ambidextrous HRM and employee performance through individual ambidexterity

Fernandez-Alles <i>et al.</i> (2025)	dyadic cross-sectional field survey	organizational (N = 39 managers) and individual (N = 39 employees)	linear regression	multiplicative, additive, and difference score	Organizational and individual ambidexterity both positively (although separately) influence the performance of university technology transfer offices
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Table II. Sample demographics

Unit demographics		Employee demographics	
<i>Unit type</i>		<i>Gender</i>	
Line units (e.g., divisional units)	52.2%	Male	37.3%
Staff units (e.g., corporate functions)	47.8%	Female	62.7%
<i>Unit level</i>		<i>Age</i>	
One level below the CEO	53.0%	29 and less	21.0%
Two levels below the CEO	28.9%	30-39	29.0%
Three or more levels below the CEO	18.1%	40-49	31.2%
<i>Number of units per organization</i>		50 and more	19.0%
One unit	9.2%	<i>Educational level</i>	
Two or three units	32.4%	Secondary	32.6%
Four or five units	46.2%	College	16.5%
Six or more units	12.2%	Bachelor degree	44.1%
<i>Number of respondents per unit</i>		MSc and PhD	6.8%
One employee	17.4%	<i>Job type</i>	
Two employees	19.3%	Managers	26.4%
Three employees	27.8%	Professionals	26.9%
Four employees	18.1%	Clerical staff	34.8%
Five or more employees	17.4%	Manual workers	12.0%
<i>Number of respondents per organization</i>		<i>Job tenure</i>	
Less than four employees	6.2%	Less than six months	3.4%
4 to 7 employees	21.6%	6-12 months	2.1%

8 to 11 employees	30.7%	One to five years	27.3%
12 to 15 employees	18.5%	Five to ten years	24.6%
16 to 19 employees	13.9%	Ten to fifteen years	11.5%
Twenty or more employees	9.0%	Fifteen or more years	24.33%

Note: Sample size includes 65 organizations, 259 managers, and 816 employees; * Relative unit size (A Likert-type agreement item: The number of employees in your organizational unit is too small to get the job done.)

Table III. Survey items and factor loadings

	Construct	Items	λ	α	AVE	CR
Unit-level	Unit alignment	The organization's management systems consistently support our organizational unit's overall goals.	.842	.713	.602	.724
		The management systems in this organization encourage employees in our organizational unit to spend resources on unproductive activities (R).	.758			
		People in our organizational unit often do contradictory things because management systems set conflicting goals (R).	.722			
	Unit adaptability	Management systems in this organization are flexible enough to allow employees in our organizational unit to respond quickly to market changes.	.707	.686	.573	.608
		The management systems in this organization evolve rapidly in response to changes in the business priorities of our organizational unit.	.804			
	Cross-training	Employees in your organizational unit have been trained to perform a variety of tasks.	.807	.750	.618	.750

Individual-level		Employees in your organizational unit are learning how to perform different tasks/jobs.	.812			
		Your employees have been cross-trained to substitute for one another if needed.	.737			
	Work exploration	I perform activities whose benefits or costs are currently unclear.	.661	.645	.462	.653
		I perform activities that require significant adaptation on my part.	.708			
		I perform activities that require me to learn new skills or knowledge.	.630			
		I perform activities that are (still) not part of a clear, existing organizational policy.	.715			
	Work exploitation	I perform activities with which I already have extensive experience.	.815	.734	.584	.742
		The activities I perform are routine.	.743			
		I perform activities for which it is clear how to execute them.	.764			
		I perform activities that I can adequately execute using my existing knowledge.	.732			
	Task performance	This employee is better than other employees I have previously supervised.	.836	.906	.845	.908

		The overall work performance of this employee is above average.	.943			
		My personal impression is that this employee is highly efficient.	.957			
		Overall, I believe this employee performs their roles and responsibilities effectively.	.936			

Note: λ – Factor loading; α – Cronbach’s alpha; AVE – average variance extracted; CR – Composite reliability (McDonald’s omega); R – reversed item

Table IV. Means, standard deviations and correlations

		Mean (SD)	1	2	3	4	5	6	7	8
Unit-level variables										
1	Unit adaptability	3.719 (.797)	-							
2	Unit alignment	3.834 (.724)	.447**	-						
3	<i>Unit ambidexterity</i>	14.514 (4.676)	.851**	.830**	-					
4	Cross-training	4.020 (.689)	.535**	.248**	.469**	-				
Individual-level variables										
5	Work exploration	2.880 (.679)	.066	.026	.063	.075	-			
6	Work exploitation	4.180 (.589)	.088	.261**	.191**	.030	-.083*	-		
7	<i>Individual ambidexterity</i>	12.005 (3.285)	.107	.156*	.155*	.078	.837**	.461**	-	
8	Task performance	3.997 (.846)	.217**	.233**	.287**	.317**	.081*	.068 ⁺	.111**	-

Note: N (pairwise) = 203 units and 685 employees; ⁺ p < .10, * p < .05, ** p < .01; shaded numbers represent cross-level correlations; Second-order latent variables are in italic

Table V. Multilevel (moderated) mediation results

Predictors/Outcomes	Product approach				Additive approach			
	Mediation		Moderated mediation		Mediation		Moderated mediation	
	Individual ambidexterity	Task performance	Individual ambidexterity	Task performance	Individual ambidexterity	Task performance	Individual ambidexterity	Task performance
	<i>Model 1a</i>	<i>Model 1b</i>	<i>Model 2a</i>	<i>Model 2b</i>	<i>Model 3a</i>	<i>Model 3b</i>	<i>Model 4a</i>	<i>Model 4b</i>
<i>Within-effects</i>								
Constant	6.389** (1.911)	1.270* (.552)	2.028 (2.699)	1.270* (.552)	5.298** (.512)	-.110 (.716)	3.235** (1.059)	-.110 (.716)
Education	-.118 (.187)	.012 (.038)	-.118 (.187)	.012 (.038)	-.012 (.049)	.012 (.038)	-.012 (.049)	.012 (.038)
Organizational tenure	.017 (.021)	-.003 (.004)	.017 (.021)	-.003 (.004)	.006 (.006)	-.003 (.004)	.006 (.006)	-.003 (.004)
Paradox mindset	.698** (.249)	.016 (.051)	.699** (.249)	.016 (.051)	.200** (.065)	.015 (.051)	.200** (.065)	.015 (.051)
Individual ambidexterity	-	.007 (.010)	-	.007 (.010)	-	.029 (.037)	-	.029 (.037)

<i>Between-effects</i>								
Education	-.292 (.201)	.189** (.058)	-.339 ⁺ (.199)	.189** (.058)	-.077 (.051)	.192** (.058)	-.089 ⁺ (.051)	.192** (.058)
Organizational tenure	-.022 (.023)	.013* (.006)	-.020 (.024)	.013* (.006)	-.003 (.006)	.012 ⁺ (.006)	-.002 (.006)	.012 ⁺ (.006)
Paradox mindset	-	-.062 (.122)	-	-.062 (.122)	.336** (.108)	-.056 (.123)	.345** (.107)	-.056 (.123)
Team cohesion	.186 (.304)	.203* (.088)	.153 (.303)	.203* (.088)	.058** (.077)	.208* (.089)	.047 (.077)	.208* (.089)
Unit size	.198 (.125)	.097** (.036)	.220 ⁺ (.124)	.097** (.036)	.053 ⁺ (.032)	.097** (.037)	.057 ⁺ (.031)	.097** (.037)
Unit level	.227 (.166)	.015 (.047)	.264 (.164)	.015 (.047)	.055 (.042)	.013 (.048)	.066 (.042)	.013 (.048)
Unit ambidexterity	.057 ⁺ (.033)	.046** (.009)	.348* (.153)	.046** (.009)	.059 ⁺ (.030)	.155** (.034)	.321* (.135)	.155** (.034)
Individual ambidexterity	-	.055** (.021)	-	.055** (.021)	-	.212* (.083)	-	.212* (.083)
Cross-training	-	-	1.187* (.521)	-	-	-	.584* (.248)	-

Cross-training x Unit ambidexterity	-	-	-.078* (.037)	-	-	-	-.073* (.034)	-
Model Fit (AIC)	4648.224		4647.078		2965.037		2963.371	
Model Fit (BIC)	4791.710		4800.812		3108.522		3117.105	

Note: † $p < .10$, * $p < .05$, ** $p < .01$; Standard errors are presented in brackets

Figure 1 Research model

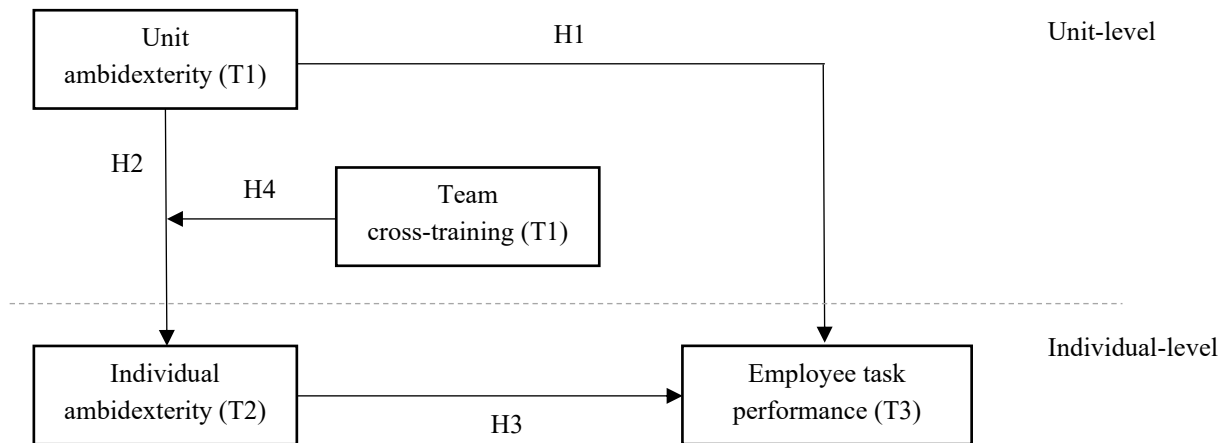


Figure 2 Research process diagram

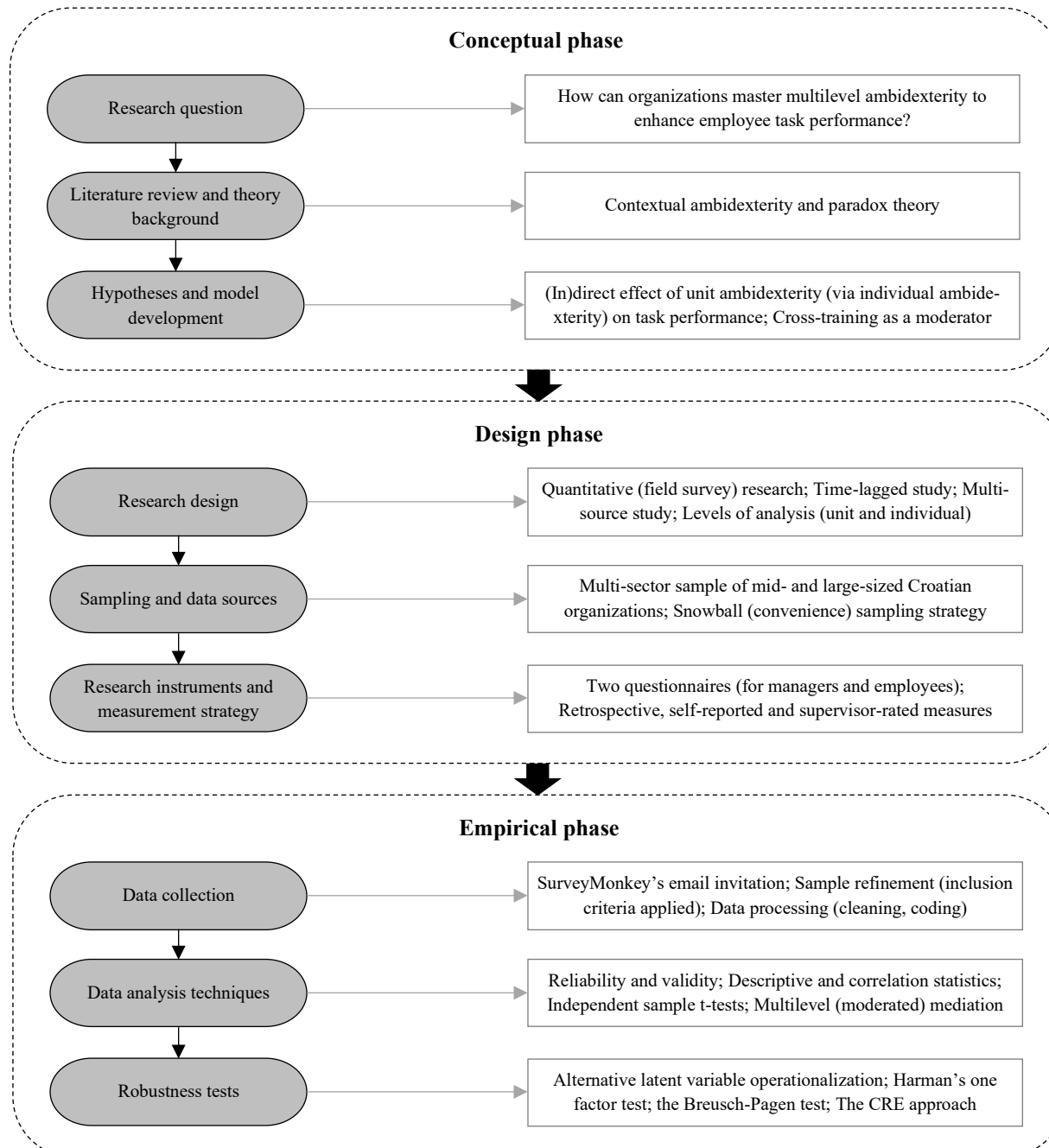


Figure 3 Cross-level interaction between unit ambidexterity, cross-training, and individual ambidexterity

