

A Paradoxical Lens to Achieve Frontline Employees' Ambidexterity: The Roles of Paradoxical Leadership and Coordination Mechanisms

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ABSTRACT

As the microfoundations of organisational ambidexterity and performance, the individual ambidexterity of frontline employees has an ever-increasing demand to be learned. Drawing on a paradox lens on leadership, this research proposes a multilevel model of how and when supervisors' paradoxical leadership enhance frontline employees' ambidexterity. This process should be intervened or impacted by structural systems which can coordinate the context into individual behaviour. Combined with coordination mechanisms, this research proposes the impact of paradoxical leadership to be mediated by connectedness and moderated by formalisation and centralisation. An online survey with a cross-sectional design has been conducted, obtaining the data that composed of 429 responses from frontline employees in 23 firms in China, which were tested by hierarchical regression analysis. The findings indicate that paradoxical leadership has a positive direct impact on frontline employees' ambidexterity and a positive indirect impact on it via connectedness. Formalisation significantly and positively moderates the impact of connectedness on individual ambidexterity, but centralisation does not significantly interact with connectedness. Both formalisation and centralisation play a nonsignificant impact on the indirect relationship.

Keywords: Individual ambidexterity, frontline employees, paradox lens, paradoxical leadership, coordination mechanisms, hierarchical level.

INTRODUCTION

Ambidexterity – a phenomenon, capability, and behaviour that achieves exploration and exploitation simultaneously (Duncan, 1976; March, 1991). Exploitative activities utilise existing resources and capabilities to refine existing products, services, and processes (March, 1991). Explorative activities identify and develop new technologies and ideas to generate new products, services, and processes (March, 1991). Studies have found that ambidexterity is positively related to performance at the organisational (He & Wong, 2004), group (Jansen et al., 2006), and individual level (Mom et al., 2009). In the recent decade, individual ambidexterity has drawn scholars' attention as an important micro view of organisational ambidexterity and as a facilitator of performance (Mu et al., 2022).

Individual ambidexterity refers to individual capability or behaviour to resolve the conflicts between exploration and exploitation in order to achieve both simultaneously (Mom et al., 2007, 2009). Compared with the group and organisational level ambidexterity, the studies on individual-level ambidexterity is much limited, and a potential reason is that it lacks of classification (Mu et al., 2022). It has been suggested to conceptualise individual ambidexterity by hierarchical levels to have a fine-grained classification (Kassotaki et al., 2019; Swart et al., 2019; Zhou et al., 2022). The reason is that the paradoxical challenges from exploration–exploitation complex are differed at different hierarchical levels (Kassotaki et al., 2019). Kassotaki et al. (2019) identified three paradoxes at three hierarchical levels. At the senior level, the paradox is the goals between stable revenues and cost efficiency. At the middle management level, the paradox is between focusing on clearly set goals and using innovative ideas. At the frontline employees' level, the paradox is between discipline and creativity. Similarly, Swart et al. (2019) found that individuals at five hierarchical levels tend to adopt different actions to enable their ambidexterity. Additionally, existing studies has examined individual ambidexterity with samples from senior managers (e.g., Luo et al., 2018), middle managers (e.g., Mom et al., 2019), and frontline employees (e.g., Kauppila & Tempelaar, 2016) separately. These pieces of evidence suggests a three-hierarchical-level classification on individual ambidexterity, which is adopted by this research, i.e., senior management level, middle management level, and frontline employees' ambidexterity.

While the antecedents of senior and middle managers' ambidexterity have received significant emphasis (Mom et al., 2015; Rogan & Mors, 2014; Tempelaar & Rosenkranz, 2019; Torres et al., 2015), studies on achieving frontline employees' ambidexterity are still incomplete. Frontline employees occupy the lowest hierarchical level in organisations, which means they have less authority and self-determination to pursue personal goals proactively, fewer channels to receive information and resources, and are more likely to be affected by the surrounding environment within organisations (Williams, 2014). Within limited flexibility of frontline employees, they are more likely to be impacted by external environments created by the organisation. However, most existing papers focus on employees' individual characteristics and neglect macro-level antecedents (Kao & Chen, 2016; Yu et al., 2020). Therefore, we propose a configuration of leadership and coordination mechanisms to achieve ambidexterity.

First, leadership can create a context that affects frontline employees' behaviour (Adler et al., 1999; Gibson & Birkinshaw, 2004). Frontline employees face paradoxical challenges of achieving discipline and creativity simultaneously within limited authority and flexibility (Kassotaki et al., 2019), which highlights the role of leadership in regulating or inspiring their actions. To address the paradoxical challenges from exploration and exploitation activities, a paradox lens of leadership is desirable to enable frontline employees' ambidexterity, which is known as paradoxical leadership (Kauppila & Tempelaar, 2016). Second, coordination mechanisms reflect the characteristics of the organisational structure that influence frontline employees' activities (Jansen et al., 2006, 2009). Based on this requirement, this paper examines the role of informal (i.e., connectedness) and formal (i.e., formalisation and

centralisation) coordination mechanisms in the achieving frontline employees' ambidexterity (Mom et al., 2007, 2009).

Our research contributes to the literature on individual ambidexterity, leadership, and coordination mechanisms. We contribute to the conceptualisation of individual ambidexterity by focusing on frontline employees' ambidexterity and the content of their paradoxical challenges. We use a paradox lens to understand frontline employees' ambidexterity and identify paradoxical leadership as an appropriate antecedent. We extend the process from paradoxical leadership to individual ambidexterity by incorporating coordination mechanisms into this relationship, identifying the mediator connectedness and moderator formalisation. The new configuration of paradoxical leadership and coordination mechanisms provided by this process extends knowledge of achieving frontline employees' ambidexterity. In the following sections, this research conceptualises the research framework and proposes hypotheses in the Theory and Hypotheses section, conducts a quantitative research in the Methodology section, describes and analyses findings in the Results and Discussion sections respectively, and ends with a Conclusion section.

THEORY AND HYPOTHESES

Frontline Employees' Ambidexterity

Individual ambidexterity refers to the ability of an individual to complete both exploratory and exploitative activities (Mom et al., 2007). Exploration refers to creative behaviour and radical innovation on products, services, and processes. Exploitation means implementing strategy and incremental innovation such as completing previous tasks more efficiently (Hughes et al., 2018; March, 1991; Mom et al., 2007). While the unified definition on individual ambidexterity is that individuals need to achieve exploration and exploitation simultaneously (Mom et al., 2007, 2009), the detailed content of individual ambidexterity changes according to the individuals' roles and positions. As organisational members are located at different hierarchical levels (i.e., senior management, middle management, and frontline employees' levels), their paradoxical challenges coming from the exploration-exploitation complex differ. At the non-management level, Rosing and Zacher (2017) defined exploration as "experimentation, searching for alternative ways to accomplish a task, and learning from errors" and exploitation as "relying on previous experience, putting things into action, and incrementally improving well-learned actions" (p. 686).

Ambidextrous individuals gradually evolve from multi-strategy-makers to multitaskers from the senior management to frontline employees' level (Floyd & Lane, 2000; Schultz et al., 2013). Frontline employees face paradoxical challenges coming from discipline and creativity (Andriopoulos & Lewis, 2009). For example, Schultz et al. (2013) suggested that R&D employees' paradoxical challenge is pursuing innovation while completing operational tasks. To behave ambidextrously, R&D employees need to balance multitasks by reasonably and efficiently distributing their limited time. They are not only responsible to complete fundamental operations required by the organisational rules and direct managers in the short term, but also the frontline of the organisation to catch opportunities to contribute to the organisation's competitive advantage in the long term (Prieto-Pastor and Martin-Perez, 2015). The conflicts between the short- and long-term activities come from resource scarcity, access limitation to information and knowledge, and authority restriction (Cao et al., 2009; Chandrasekaran, 2009).

The antecedents of frontline employees have involved both macro and micro mechanisms and have been suggested to combine individual and organisational mechanisms (Zhou et al., 2022). At an individual level, frontline employees' personal characteristics such as their learning orientation, self-regulation, intrinsic motivation, and self-efficacy can improve

their ability to balance exploration and exploitation to behave ambidextrously. Various leadership behaviours reportedly enable frontline employees' ambidexterity: ambidextrous leadership (Zacher et al., 2016; Zacher & Wilden, 2014), paradoxical leadership (Kauppila & Tempelaar, 2016), management support (Prieto-Pastor & Martin-Perez, 2015), inspirational leadership (Salas Vallina et al., 2019), and transformational leadership (Yu et al., 2020). However, majority of these (i.e., management support, paradoxical leadership, and transformational leadership) have been studied as moderators rather than antecedents, and the leadership process need to be understood.

Skewed towards individual level antecedents, antecedents of frontline employee's ambidexterity have been indicated as self-motivated, but the organisational factors have been omitted, which is paramount to utilise organisational factors to enable the lower-level employees to manage their exploration and exploitation with limited resources, knowledge, information, support, and authority. The explored organisational-level mechanisms include organisational culture and various systems, which can transfer the information to frontline employees that whether their ambidexterity is encouraged. Therefore, research needs considerable extension to understand the mechanisms that could describe organisational context to enhance frontline employees' ambidexterity. The unexplored antecedents of frontline employees' ambidexterity can be observed from the literature. Since frontline employees face regulations on tasks and routines, their ambidexterity is considerably managed and influenced by organisational factors. Therefore, more organisational-level mechanisms need further research, such as coordination mechanisms. These mechanisms formulate the environment around frontline employees impact their behaviour.

Paradoxical Leadership

Individual ambidexterity is impacted by their direct managers' leadership style (Rosing et al., 2011). The lower hierarchical level an individual goes, the larger extent the individual is impacted by their direct managers' behaviour, and the more the individual needs a manager for his or her ambidextrous innovation (Åmo, 2006; Zhou et al., 2022). This emphasises the importance of an appropriate leadership style for frontline employees' ambidexterity.

To encourage employees' ambidextrous activities, scholars suggest that leadership needs to perceive behavioural complexity (Kauppila & Tempelaar, 2016), which means that leaders need to show multiple behaviours to respond to paradoxical demands from job requirements, so the followers will be motivated to engage in dual orientation activities simultaneously and solve the exploration-exploitation complex. Paradoxical leadership is such a leadership style, consisted of managerial support and performance expectations dimensions (Kauppila & Tempelaar, 2017).

Frontline employees' ambidexterity could be facilitated by their direct managers' paradoxical leadership from its two dimensions. First, by communicating with frontline employees to express high performance expectations on their behaviour and performance, supervisors can encourage frontline employees to understand their working objective accurately, completing short-term tasks especially routinised activities efficiently, and improve their work quality gradually. Hence, frontline employees' exploitative behaviour is elicited. Second, supervisors who build a supportive working context can benefit followers' explorative activities, as this context encourages frontline employees to experiment and shows a high tolerance for failure (Gibson & Birkinshaw, 2004; Kauppila & Tempelaar, 2016). Third, combining the two dimensions, paradoxical leadership shows a characteristic of behavioural complexity, which matches the demand from exploration-exploitation complex of individual ambidexterity (Hoojiberg, 1996; Smith & Lewis, 2012). Frontline employees, therefore, have more authority to handle conflict demands of exploration and exploitation, so achieve efficiency and flexibility simultaneously (Jansen et al., 2009; Lewis et al., 2014). In other words,

the supervisors' paradoxical leadership guide detailed working tasks of frontline employees to achieve a balance between explorative and exploitative activities. Therefore,

H1: Paradoxical leadership of frontline employees' supervisors is positively related to frontline employees' ambidexterity.

Informal Coordination Mechanism

As a manifestation of the organisational structure, coordination mechanisms can be divided into formal and informal aspects (Tsai, 2002). Formal coordination mechanisms integrate different activities through existing rules and systems, while informal coordination mechanisms refer to emerging connections that combine different activities across boundaries such as functional boundary or cross-level boundary (Tsai, 2002).

Informal coordination mechanisms refer to informal structural conditions, rules, and routines, which connect organisational members loosely while providing them with more knowledge and authority (Chang & Hughes, 2012; Jansen et al., 2006). An informal coordination mechanism has the potential to decrease the organisational restriction on frontline employees' access to authority and information (Gibson et al., 2019), which have the potential to further impact their ability to achieve ambidexterity (Jansen et al., 2006). As a main type of informal coordination mechanisms, connectedness refers to the size of direct personal contact from an individual with other organisational members across hierarchical levels and horizontal functions. It is described as the density of a network (Jaworski & Kohli, 1993; Sheremata, 2000) and is formed by various communication channels. While managers' instructions and behaviours can promote or impede communication and social integration in organisations, leadership behaviour is a potential antecedent of connectedness, but this lacks study. Meanwhile, scholars have found the extent of connectedness being positively related to ambidexterity at the organisational level (Chang & Hughes, 2012), unit level (Jansen et al., 2006), and individual level (middle managers' ambidexterity; Mom et al., 2009). However, the impact of connectedness focusing on frontline employees' individual ambidexterity remains unexplored.

While paradoxical leadership expresses high-performance expectations and strong management support, the relationship between supervisors and frontline employees is encouraged through various communication channels, indicating more opportunities for direct personal contact between frontline employees and supervisors. The flexible and frequent communication between supervisors and frontline employees decrease the extent of the distance across hierarchical levels. Therefore, the loosely coupled and informal systems are promoted vertically. Furthermore, the context created by supervisors promotes communication and coordination between frontline employees and peers, so the informal routines, relationships, and systems are facilitated at the frontline employees' level horizontally. Therefore, the network owned by frontline employees is enlarged vertically and horizontally within organisations. Thus,

H2: Paradoxical leadership of frontline employees' supervisors is positively related to connectedness from frontline employees to their organisations.

As an informal coordination mechanism, connectedness promotes the holism of the information in an organisation (Tsai, 2002). The larger size of direct networks an employee owns, the more information and ideas will be communicated and integrated to the employee. Individuals, therefore, can absorb knowledge refine existing techniques and skills (Chang & Hughes, 2012). Furthermore, a highly connected network can "increase the opportunity for feedback and error correction and for the synthesis of different points of view" (Tushman & Nadler, 1978, p.618). The feedback and error correction promotes employees to make fewer mistakes. Integrating different viewpoints and absorbing complimentary knowledge will

promote employees to be more comprehensive and considerate when complete tasks. These actions will increase their ability to implement exploitative activities.

Connectedness increases opportunities for informal knowledge sharing by exposing different knowledge sources in an organisation to a frontline employee through various interactive channels. Communication channels will be broadened with new ideas, information, and knowledge diffused among frontline employees (Tsai, 2002). Learning and combining different knowledge sources that might be irrelevant to each other, frontline employees have more opportunities to develop radical innovation (Jansen et al., 2006; March, 1991; Sheremata, 2000). A highly connected network for frontline employees also blurs the boundaries between the higher hierarchical levels' organisational members and frontline employees. Close relationships between employees and leaders, or employees and peers, encourage employees to develop their working style during daily tasks, thus benefits their explorative behaviour. Furthermore, a highly connected network around a frontline employee can increase the employee's ability to make high-quality trade-off decisions and synthesis exploitative and exploitative activities (Atuahene-Gima, 2005; Sheremata, 2000). Therefore,

H3: Connectedness is positively related to frontline employees' ambidexterity.

Previous studies suggested leadership has an indirect effect on organisational members' ambidextrous behaviour (Luo et al., 2018; Salas Vallina et al., 2019). Gibson and Birkinshaw (2004) argued that leadership creates a context (which could be various elements, systems, and structures) around individuals. Such a context, such as connectedness of organisational structure, can impact individual behaviour through encouraging communication and knowledge process. In other words, the consequences of paradoxical leadership on frontline employees' ambidexterity might be due to a structure of connectedness around the employees. However, without combining leadership that encourages communication and knowledge sharing, the connectedness around frontline employees cannot be formulated. A lack of connectedness can impede frontline employees to receive paradoxical leadership and generate individual ambidexterity. Therefore, this paper expects a connected structure at the frontline employees' level to affect individual ambidexterity by mediating the impact of supervisors' paradoxical leadership.

H4: Connectedness mediates the relationship between paradoxical leadership and frontline employees' ambidexterity.

Formal Coordination Mechanisms

While informal coordination mechanisms process resources and knowledge in loosely coupled systems, formal coordination mechanisms complement it with tightly coupled and routinised systems (Chang & Hughes, 2012; He & Wong, 2004). Some scholars suggested that formal and informal coordination need to co-exist to drive exploitative and explorative activities, with a possible routine that formal coordination mechanisms influence exploitative activities and informal coordination mechanisms influence explorative activities (Kang & Snell, 2009; Mom et al., 2009; Jansen et al., 2006). However, the results of their studies did not fully support their arguments. For example, Jansen et al. (2006) found that centralisation, a formal coordination mechanism, is not significantly relevant to exploitation, but Mom et al. (2009) found that decentralisation is positively related to ambidexterity (i.e., both exploration and exploitation). Actually, it has been argued that formal coordination mechanisms' influence on behaviour and performance is unavoidably impacted by informal coordination mechanisms (Chang & Hughes, 2012). These findings suggest us to view the relationship between the combined effect of formal and informal coordination mechanisms and individual ambidexterity directly. This paper explores formalisation and centralisation as two chief formal coordination mechanisms that moderate the relationship between connectedness and frontline employees' ambidexterity.

Formalisation means the extent of an organisation's standardised structures, processes, and regulations (Jansen et al., 2006). At the organisational level, the combination of formalisation and connectedness facilitates ambidexterity (Chang & Hughes, 2012). At the unit level, formalisation is positively related to exploitation, however, it has not significant relationship with exploration (Jansen et al., 2006). At the individual level, formalisation does not impact managers' ambidexterity (Mom et al., 2009). However, there has been no studies focusing on the complementing role of formalisation in the relationship between connectedness and individual ambidexterity of frontline employees.

Formalisation facilitates frontline employees' exploitative activities by refining existing skills and knowledge and improving the quality and efficiency existing activities (Kang & Snell, 2009). Meanwhile, formalisation does not prevent exploration (Chang & Hughes, 2012; Jansen et al., 2006; Mom et al., 2009). Even large organisations with high-level formalisation still can generate high-level exploration. Furthermore, formalisation plays a complementing role in connectedness to achieve better individual ambidexterity. While frontline employees' explorative and exploitative activities are facilitated by connectedness through random routines, they also are damaged by over-connectedness. Explorative activities are complicated to be integrated into existing activities, and exploitative activities are possibly impeded by an over-loose context (Mom et al., 2009). This situation is avoided by standardised routines and regulations which coordinate individual actions and process explorative and exploitative activities in well-organised forms. In other words, the combination of formalisation and connectedness can improve individual ambidexterity. Therefore,

H5a: Formalisation positively moderates the effect of connectedness on frontline employees' ambidexterity.

H5b: Formalisation positively moderates the strength of the indirect relationship between paradoxical leadership and frontline employees' ambidexterity via connectedness.

Centralisation is one of the fundamental manifestations of structural design (Tsai, 2002). It represents the control of decision-making authority that coordinates the relationship and processes from top to down (Jansen et al., 2006). Existing studies have found centralisation negatively impacts exploration but does not have a significant relationship with exploitation at the unit level (Jansen et al., 2006). However, the moderating role of centralisation on the relationship between centralisation and individual ambidexterity of frontline employees has not been explored.

Centralisation discourages knowledge sharing among individuals within an organisation (Tsai, 2002). It prevents individuals from being distracted by irrelevant knowledge, instead focusing on the requirements made by the higher-level authority. Therefore, working as a direct antecedent, centralisation might impede organisations, units, and individuals to achieve ambidexterity (Bidmon & Boe-Lillegraven, 2020). However, working as a moderator on the relationship between connectedness and frontline employees' ambidexterity, centralisation is complementary to connectedness by regulating and controlling the dispersed ideas, knowledge, and information. Accordingly, frontline employees' explorative activities which were facilitated by connectedness will be regulated and processed into existing activities to generate new products, services, and other manifestations of radical innovations. Meanwhile, frontline employees' exploitative activities will be improved and regulated upon by the centralisation to avoid the side-effect of over-connectedness on impeding efficiency (Mom et al., 2009). Therefore,

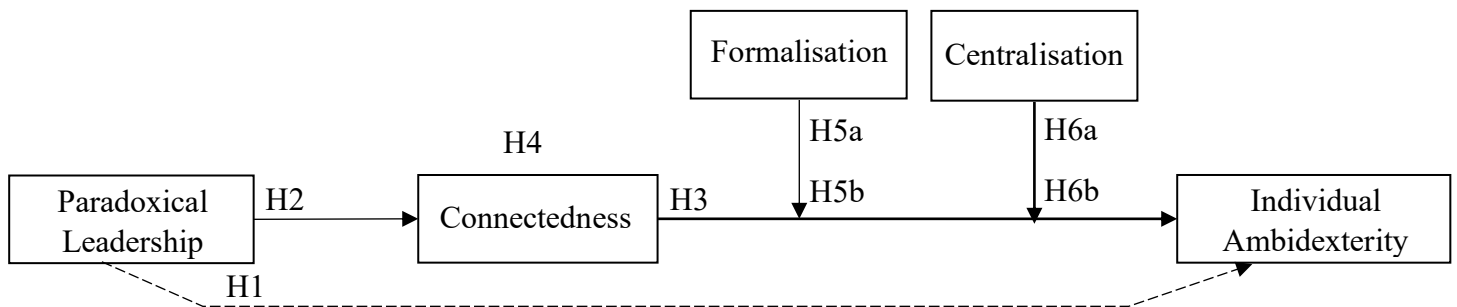
H6a: Centralisation positively moderates the effect of connectedness on frontline employees' ambidexterity.

Meanwhile, centralisation means less discretion of employees when completing working tasks, so the efficiency of knowledge transferring, such as instructions and

requirements from supervisors to employees, might be restricted, so as employees' exploitative and explorative behaviours (Poppo, 1995). This process amplifies the function of leadership behaviours (Tsai, 2002). The paradoxical leadership of supervisors thus plays an important role, as employees are hard to achieve ambidextrous behaviour unless their leadership require them to do so. Therefore,

H6b: Centralisation positively moderates the strength of the indirect relationship between paradoxical leadership and frontline employees' ambidexterity via connectedness.

Figure 1 Conceptual Model



METHODOLOGY

Data Collection and Samples

The target firms are collected from the Tianyancha website, a formal website containing the basic information of all the registered companies in China. The criteria include external environment (i.e., geography, economy, and industry), firm size, and the hierarchy number in the firm. A cover letter, a whole sample questionnaire and a form of the organisation's basic information to be filled were sent to senior managers to introduce this survey. If the senior manager has showed the willing to attend the survey, they distributed the questionnaires and encouraged to answer questions. Twenty-three firms showed their willingness to attend the survey, spreading across the cities located in the economically developed area, most of which in the coastal area, including Shanghai, Changzhou, Chongqing, Chengdu, Qingdao, Yantai, Dalian, and Changchun. Web-based survey was chosen as it can promote efficient data collection, provide cost effectiveness, and improve data privacy, and benefit real-time observation and analysis. We distributed questionnaires to 830 frontline employees, and received 448 back with a 54% response rate, which is a high response rate in the circumstance of respondents are organisational members (Cycyota & Harrison, 2002; Baruch & Holtom, 2008). After the data screening and imputation, 429 questionnaires are retained to be valid for data analysis. The following industries were represented in the final sample analysed (number of firms): manufacturing (8), consulting and business service (6), health care service (5), real estate (2), and educational services (2). Data from different industries benefits the study through improving the external validity.

Our of 429 employees, 211 (49.18%) are male and so as female. 7 people preferred not to say their gender. The average of the employees was 25.8 years. Their age mainly distributed in the section of below 39 (68.3%). 142 (33.10%) are below 30 years of age, 151 (35.20%) are between 30 and 39, 90 (20.98%) are between 40 and 49, and 46 (10.72%) are above 49. As for job tenure, 345 (80.42%) have 5 or less than 5 years' work experience on their position, 70 (16.32) have worked on their position 6 to 10 years, and 14 (3.26%) have more than 10 years

job tenure. The majority of the respondents are junior school (142; 33.1%), high school (91; 21.21%), and college (140; 32.63%). Only 56 employees have a graduate grade (13.05%).

Measurements

A five-point Likert scale ranging from a (strongly disagree) to 5 (strongly agree) was used to measure the constructs, because (1) five-point is more acceptable by respondents to give a high response; (2) five-point scale can be fully displayed on the phone interface without dragging the scrollbar; and (3) it is argued that the five-, seven-, and even ten-point Likert scale's data's means and variance are quite similar to each other (e.g., Krosnick & Presser, 2010, pp. 263-313). We used a translation-back-translation procedure to translate the original items from English to Chinese and then back to English (Brislin, 1970). As for the English version, most of the questions come from previous literature with robust and reasonable construct, so their wording has been pre-tested among scholars in the field. The English wording were reviewed by two academics in the relevant field who have experienced on designing questionnaires. The Chinese wording was checked by two Chinese bilingual researchers in the relevant field to meet the requirement of unambiguity, simple, concise, and eliminating social desirability. The translation process continued until the wording meet the requirement and the Chinese and English language versions essentially agree with each other.

Frontline employees' ambidexterity. We assessed frontline employees' ambidexterity using scales and the two-step procedures developed and validated by Mom et al. (2009). First, employees answered two seven-item scales of exploration and exploitation from Mom et al. (2009) to evaluate their behaviour in the past one year. We adapted five items from Mom et al. (2009) for exploration at the non-managerial level, which is related to routines, something new and totally new knowledge ($\alpha = .924$). We then adapted seven items for exploitation, which is related to experimentation and alternative methods to accomplish a task ($\alpha = .935$). Second, we calculated the multiplicative interaction between exploration and exploitation to measure individual ambidexterity as a second-order formative latent variable (Wang & Rafiq, 2014), which has been suggested as the most appropriate measure on ambidexterity (Cao et al., 2009; Mom et al., 2009).

Paradoxical leadership. Frontline employees, that is employees at the lowest hierarchical level in a firm, are the respondents of the measures of paradoxical leadership. They are asked to assess their supervisors or group managers. Three items were taken from Kaupila and Tempelaar (2016) to evaluate high performance expectation, which were adopted from Podsakoff et al. (1990). Sample items include 'My supervisor shows us that he/she expects a lot from us'. To measure managerial support, eight items were adopted from the perceived managerial-support scale created by Nifadkar et al. (2012) which was developed from the measure of the perceived organisational support by Eisenberger et al. (1986). Sample items include "my supervisor is willing to help me when I need a special favour". However, two reversed items were deducted (i.e., If given the opportunity, my supervisor would take advantage of me; My supervisor shows very little concern for me) as they had high factor loadings on a separate factor, forming an error factor, indicating a low consistency with the other items in the same dimension. Hence, six dimensions were remained for high performance expectation. The items in two dimensions formed a single factor in exploratory factor analysis (EFA) ($\alpha = .964$).

Connectedness. Connectedness is measured by a five-item scale adapted from Jaworski and Kohli (1993). The level of items is adapted from the unit level to the firm level and contribute to a unidimensional construct ($\alpha = 0.869$). One item was removed from the original six-item scale, which is "Junior managers in my department can easily schedule meetings with junior managers in other departments" because this item does not fit response from frontline employees. Another item (i.e., Managers discourage employees discussing work-related

matters with those who are not immediate superiors) was removed because it has a low correlation with the factor (factor loading < 0.5).

Formalisation. Formalisation is measured by five items developed by Deshpande and Zaltman (1982) and adopted by Jansen et al. (2006). Sample items include ‘whatever situation arises, written procedures are available for dealing with it’ ($\alpha = 0.873$). Formalisation’s measures were created into one factor construct. However, our initial EFA result shows that the five items formed two factors. The second factor is composed of two items – “Whatever situation arises, written procedures are available for dealing with it” and “Employees in our organisational unit are hardly checked for rule violations”, which can be treated as an error factor.

Centralisation. Centralisation is measured by the subconstruct of hierarchy of authority (Dewar et al., 1980; Jansen et al., 2006) with five items. Sample items including ‘there can be little action taken here until a supervisor approves a decision’ ($\alpha = 0.875$).

Control variables. To control for the characteristics of individual experience which might influence their work behaviour (Birkinshaw & Gibson, 2004), this research includes individual’s *age*, which are proposed to be positively related to individual ambidexterity (Tushman & O’Reilly, 1996). *Tenure in current job* is also included because an increasing level of a person’s job specification might negatively relate to his or her individual ambidexterity (Birkinshaw & Gibson, 2004). We also controlled for *educational effects* by including four choices, covering degrees from ‘below the bachelor’s level’ to ‘PhD or DBA’. Because the level of education is positively related to the person’s cognitive ability, the individual ambidexterity is suggested to be affected by educational effects (Adler et al., 1999; Mom et al., 2009).

To assess non-response bias, the research compared the answers of variables between response group (i.e., the first quarterly early respondents) and non-response group (i.e., the first quarterly late respondents) (Armstrong & Overton, 1977). The variables in the questionnaire were divided into two groups and tested by t-statistic, aiming to test difference in means between two groups. All the tests resulted into nonsignificant differences, suggesting that non-response bias is not a severe threat in this thesis. Convergent and discriminant validity were tested to promise the measures’ validity. To assess convergent validity, the researcher calculated the average variances (AVE) for each dimension. The results showed that all the constructs were higher than the minimum threshold of 0.5 (Fornell & Lacker, 1981), indicating acceptable convergent validity. Discriminant validity was assessed by the squared correlation between pairs of constructs and the AVEs of the constructs. All the squared correlations were lower than the AVEs, indicating sufficient discriminant validity. A Harman’s one-factor test is performed to test the common method bias (Podsakoff & Organ, 1986). The factors extracted by account for 76.788% of the variance explained, while the first factor only accounts for 46.989%. Therefore, a single-factor solution does not emerge at any level, and the first factor does not

RESULTS

This research used hierarchical linear regression in SPSS software (Version 27) to test the direct relationships among paradoxical leadership, coordination mechanisms, and individual ambidexterity. It also conducts bootstrapping to examine the mediated relationship and the conditional indirect effects of formalisation and centralisation.

Regression Analysis

Before testing the hypotheses, the descriptive statistics and correlations between variables are provided in Table 2. It shows that all four variables have significant correlations with the dependent variable individual ambidexterity, providing support for the following hypotheses test. Table 3 shows the regression analysis of the direct and moderated relationships. To prepare

the regression analysis, the variables to be included as interaction terms were mean-centred before calculating product terms to reduce multicollinearity. The variance inflation factor (VIF) was calculated for each model. The largest VIF is 3.185, which is below the threshold of 5, suggesting that multicollinearity is not a severe concern (O'Brien, 2007).

In Table 3, we first tested the direct effect of paradoxical leadership on connectedness. A positive and significant relationship is found ($\beta = 0.277, p < 0.001$), and hypothesis 2 is supported. The second dependent variable tested in Table 3 is frontline employees' ambidexterity. It was tested by hierarchical linear regression with six models. The control variables in model 1 illustrate that education level is positively and significantly related to frontline employees' ambidexterity ($\beta = 0.257, p < 0.001$), which means the higher the education level the employee has, the likelier the employee to achieve high-level individual ambidexterity. paradoxical leadership and connectedness were separately added into models 2 and 3. The results show that paradoxical leadership is positively and significantly related to the dependent variable ($\beta = 0.193, p < 0.001$), as hypothesised in H1. The R^2 increased from 0.053 to 0.5 in model 2, showing 44.7% of the variance of frontline employees' ambidexterity is accounted for by paradoxical leadership. The connectedness also has a positive and statistically significant coefficient to the dependent variable ($\beta = 0.488, p < 0.001$), providing support to hypothesis 16.

Table 2 Descriptive statistics and correlations of variables

Variables	Mean	S.D.	1	2	3	4	5	6	7	8
1. Individual ambidexterity	10.829	4.042	1							
2. Age	35.226	9.553	-0.026	1						
3. Job tenure ^a	3.611	3.607	0.050	0.319***	1					
4. Education	2.280	1.089	0.209***	-0.501***	-0.043	1				
5. Paradoxical leadership	3.284	0.951	0.430***	0.302***	0.824***	0.008	1			
6. Connectedness	3.640	0.736	0.499***	0.078	0.036	0.033	0.277***	1		
7. Formalisation	3.351	0.616	0.506***	0.030	0.060	-0.01	0.303***	0.484***	1	
8. Centralisation	3.251	0.548	0.484***	0.017	0.062	0.056	0.292***	0.604***	0.517***	1

Notes: N = 429. ^a An individual's number of years of tenure. *p<0.05, **p<0.01, ***p<0.001. Two-tailed test.

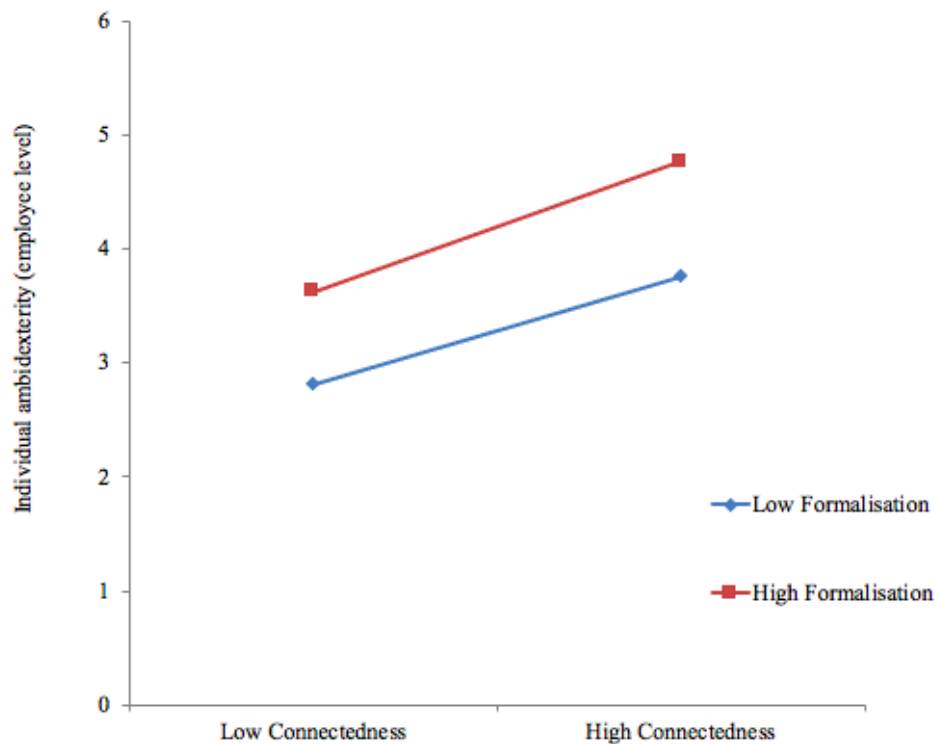
Table 3 Results of regression analysis

Variables	Connectedness (DV)	Frontline Employees' Ambidexterity (DV)					
		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Control Variables							
Age		0.093	-0.016	0.031	0.051	0.041	0.055
Job tenure		0.031	-0.921***	0.031	0.017	0.017	0.011
Education		0.257***	0.153***	0.211***	0.230***	0.204***	0.224***
Independent Variable							
H1&2: Paradoxical leadership	0.277***		1.193***				
H3: Connectedness (CON)				0.488***	0.350***	0.341***	0.270***
Interaction Effects							
Formalisation (FOR)					0.343***		0.293***
H5a: CON x FOR					0.108**		0.103
Centralisation (CEN)						0.275***	0.180***
H6a: CON x CEN						0.074	0.022
R-square	0.077	0.053	0.500	0.288	0.394	0.342	0.413
Adjusted R-square	0.075	0.046	0.495	0.281	0.385	0.333	0.402
Std. error estimate	0.708	3.948	2.872	3.427	3.169	3.303	3.127
Highest VIF	1.000	1.514	3.185	1.531	1.534	1.669	2.523

Notes: N = 429. Standardised regression coefficients are reported. *p < 0.05, **p < 0.01, ***p < 0.001. Two-tailed t test.

According to the results in model 4 which add an interaction term of connectedness and formalisation, formalisation positively moderates the relationship between connectedness and individual ambidexterity, and the moderating effect is statistically significant ($\beta = 0.108, p < 0.01$). Therefore, hypothesis 5a is supported. The interaction effects involving connectedness and formalisation are diagrammatically represented in Figure 2. The variables took the values of one standard deviation below (i.e., low level) and above (i.e., high level) the mean. Consistent with the regression result, Figure 2 shows a positive relationship between connectedness and frontline employees' ambidexterity with both low and high formalisation. Moreover, the slope of the low formalisation line (0.645) is smaller than the slope of the high formalisation line (0.778), indicating a positive moderating effect of formalisation. Holding the values of standardised connectedness at the mean, individual ambidexterity increased by 0.907 when the connectedness increased from low level to high level. These provide detailed evidence for hypothesis 5a. The findings in model 5 illustrate that the interaction term of connectedness and centralisation exhibit a positive coefficient but is statistically not significant ($\beta = 0.074, p > 0.05$). Hypothesis 6a, proposing that centralisation positively and significantly moderates the relationship between connectedness and individual ambidexterity, is thus not supported.

Figure 2 Interaction term of formalisation and connectedness to frontline employees' ambidexterity



Mediation Analysis

Hypothesis 4 predicts that connectedness mediates the relationship between paradoxical leadership and frontline employees' ambidexterity. To test this mediation, this research uses the bootstrapping mediation test (Hayes, 2017, pp. 94-107). The PROCESS macro for SPSS (model 4) with 10,000 bootstrapped samples identifies the presence of direct, indirect and total effects (see Table 4). Controlling for connectedness, the direct effect of the paradoxical leadership on individual ambidexterity is still significant ($\beta = 0.3166; t\text{-value} = 4.3854, p < 0.001$). The indirect path ($\beta = 0.1138$) had a 95 percent confidence interval that did not include 0 (0.2736, 0.7626). To conclude, these results support Hypothesis 4. Furthermore, since both

the direct and indirect effect of paradoxical leadership on individual ambidexterity is significant, connectedness partially mediates the relationship between paradoxical leadership and individual ambidexterity.

Table 4 Results of mediation analysis

Paradoxical leadership to Employees' IA

Effect path	Coeff.	SE	t	p	95% Confidence Intervals
Direct effect	0.317	0.307	4.3854	0.000	[0.7428, 1.9496]
Indirect effect	0.114	0.120			[0.2736, 0.7626]
Total effect	0.430	0.369	4.9646	0.000	[1.1054, 2.5544]

Notes: Bootstrap sample size = 10,000. Standardised regression coefficients are reported. Level of confidence interval = 95%. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Conditional Indirect Effects on Values of the Moderators

Hypotheses 5a and 6a predicted that formalisation and centralisation moderated the relationship between connectedness and frontline employees' ambidexterity. Looking through the whole model, which depicts a moderated mediation relationship, the mediated relationship via connectedness is moderated by formalisation and centralisation. Therefore, Hypothesis 5b and 6b predicted that formalisation and centralisation moderate the indirect relationship between paradoxical leadership and individual ambidexterity via connectedness. To test this conditional indirect path, this research used the PROCESS macro and SPSS software (Hayes, 2017; model 16). The two moderators' effects were tested concurrently.

The results (see Table 5) reveal that the indirect effect of paradoxical leadership on frontline employees' ambidexterity via connectedness was significant in general ($B = 3.78$, $p < 0.001$). However, the interactive effect of formalisation and connectedness on frontline employees' ambidexterity was not significant ($B = 0.6535$, $p > 0.5$). The interactive effect of centralisation and connectedness has a nonsignificant and positive coefficient to individual ambidexterity as well ($B = 0.015$, $p > 0.05$). Therefore, Hypotheses 5b and 6b are nonsignificant while tested concurrently.

To learn Hypotheses 5b and 6b in further detail, Table 6 tests the significance of the indirect effect while controlling the formalisation and centralisation at different values (i.e., low-, average-, and high-level values). Keeping formalisation at the low-level value (i.e., -1SD), the indirect effect is only significant when centralisation is at the low level of value. Keeping formalisation at the mean value (i.e., 0), the indirect effect is positive and significant, and the effect is increasing while the value of centralisation increases from low to high level (0.5522 to 0.5618). Keeping formalisation at the high-level value (i.e., +1SD), the indirect effect keeps being significant, and the effect increases from -0.5478 to 0.7977 with centralisation increasing from a low to a high level of value, showing a positive moderating effect. That is, the conditional indirect effect remains significant except when (1) formalisation is at the value of -1SD and centralisation is at the value of the mean, and (2) formalisation is at the value of -1SD and centralisation is at the value of +1SD. These results provide further information for this moderated mediation model, partially supporting Hypotheses 5b and 6b.

Table 5 Model coefficients for the moderated mediation model

Antecedent	Connectedness			Employees' IA		
	B	SE	t	B	SE	t
Age	0.004	0.004	1.054	-0.004	0.017	-0.227
Job tenure	-0.123	0.0189	-6.558***	-0.769	0.093	-8.277***
Education	0.020	0.036	0.552	0.600	0.146	4.120***
Paradoxical leadership	0.586	0.077	7.609***	3.780	0.372	10.166***
Connectedness (CON)				0.951	0.269	3.533***
Formalisation (FOR)				0.999	0.321	3.109**
CON x FOR				0.654	0.367	1.783
Centralisation (CEN)				0.752	0.380	1.978*
CON x CEN				0.015	0.401	0.037
Constant	-1.681	0.264	-6.372***	-0.181	1.209	-0.150
R-square	0.193			0.593		
F value	15.540			94.537		

Notes: Bootstrap sample size = 10,000. Unstandardised coefficient regressions are reported. Level of confidence interval = 95%. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 6 Conditional indirect effects at values of the moderators

Moderators		Conditional indirect effects at values of the moderators				
Formalisation	Centralisation	Effect	Boot SE	BootLLCI	BootULCI	Results
-1SD ^a	-1SD ^b	0.316	0.1623	0.0122	0.6639	significant
-1SD	Mean	0.321	0.2054	-0.0158	0.8087	nonsignificant
-1SD	+1SD	0.326	0.3097	-0.1634	1.0714	nonsignificant
Mean	-1SD	0.552	0.2245	0.1261	1.0097	significant
Mean	Mean	0.557	0.1708	0.2455	0.9168	significant
Mean	+1SD	0.562	0.214	0.2108	1.0554	significant
+1SD	-1SD	-0.548	0.7881	0.3426	0.1236	significant
+1SD	Mean	0.793	0.243	0.3432	1.2913	significant
+1SD	+1SD	0.798	0.1963	0.4368	1.207	significant

Notes: Bootstrap sample size = 10,000. Unstandardised coefficient regressions are reported. Level of confidence interval = 95%. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. ^a For the value of formalisation, -1SD = -0.6159, mean = 0, +1SD = 0.6159. ^b For the value of centralisation, -1SD = -0.5478, mean = 0, +1SD = 0.5478.

DISCUSSION

Theoretical Contributions

Our findings contribute to the literature on individual ambidexterity, leadership, and coordination mechanisms in several ways. First, this research contributes to the literature on individual ambidexterity by focusing on frontline employees' ambidexterity and learning the antecedents. While scholars appeal for a fine-grained classification of individual ambidexterity, current literature still conducts the examination based on its general definition. Responding to the classification by hierarchical levels with three types of individual ambidexterity (Swart et al., 2019; Zhou et al., 2022), this research focuses on the paradoxical challenges of frontline employees (i.e., discipline versus creativity within the limited authority and flexibility), enriching the conceptualisation of individual ambidexterity. Furthermore, this research developed a new routine to achieve frontline employees' ambidexterity. Recognising the paradox characteristics of individual ambidexterity and the authority limitation on frontline employees (Zhang et al., 2022; Gibson et al., 2019), we examined the cross-level impact of paradoxical leadership and the combined effect of formal and informal coordination mechanisms. The findings show that both paradoxical leadership and connectedness can drive frontline employees' ambidexterity directly, which is aligned with the literature's expectation and extend Mom et al.'s (2009) study from the middle management to frontline employees' level. This also supports the argument that paradoxical challenges faced by frontline employees need to be reconciled by mechanisms which formulate macro environments.

Second, this research suggests the effectiveness of leadership behaviour in encouraging frontline employees' ambidexterity. Examining supervisors' paradoxical leadership's direct leadership on individual ambidexterity, we found a positive relationship, consistent with the findings of Kauppila and Tempelaar (2016). However, previous studies tend to treat leadership behaviour as direct antecedents or moderators to impact individual ambidexterity (Kammerlander et al., 2015; Kauppila & Tempelaar, 2016; Zacher et al., 2016), but neglect that leadership behaviour might be an indirect mechanism to enable working behaviour (Luo et al., 2018). This paper proposed and found that paradoxical leadership indirectly impacts frontline employees' ambidexterity through connectedness, which depicts the details of paradoxical leadership's working process and expands the literature on the relationship between leadership behaviour and individual ambidexterity, indicating paradoxical leadership is an important facilitator for frontline employees' ambidexterity, directly and indirectly.

Third, this research enriches of understanding of coordination mechanisms by examining the mediating role of connectedness between paradoxical leadership and individual ambidexterity. researchers have suggested the links between supervisors' leadership and employees' behaviour are visible through multiple interactive and communication channels (Luo et al., 2018; Salas Vallina et al., 2019), but neglected the role of connectedness. The only relevant study on connectedness and individual ambidexterity is the direct relationship tested by Mom et al. (2009) at the middle management level. Furthermore, it has been pointed out there is scant attention on the combination of leadership and coordination mechanisms in the ambidexterity field, which has been learned towards organisational ambidexterity but remains a gap for individual ambidexterity (Chang & Hughes, 2012), especially for frontline employees' ambidexterity. Filling this gap emphasises the mediating role of connectedness and suggests supervisors tailor their impact to frontline employees through the channels provided by connectedness.

Fourth, this research extends the knowledge of antecedents of frontline employees by providing a configuration of formal and informal coordination mechanisms. It explores the moderating roles of formal coordination mechanisms by testing formalisation and centralisation as moderators of the relationship between connectedness and individual ambidexterity. Formalisation positively moderates the relationship, which is consistent with

previous studies at the middle management level (Mom et al., 2009) but inconsistent with previous studies at the unit level (Jansen et al., 2006), which found formalisation positively relates to exploitation but insignificantly related to exploration. These different results might be due to different configurations of coordination mechanisms (Chang & Hughes, 2012; Jansen et al., 2008, 2009). Centralisation does not work significantly, which is out of expectation and inconsistent with Mom et al.'s (2009) study. They found the interaction of decision-making authority (i.e., decentralisation) and connectedness plays a positive impact on middle managers' ambidexterity. An explanation is connectedness reconciles centralisation's impact as they have paradoxical working routines. While connectedness encourages employees to expand their network and acquire dispersed knowledge, centralisation emphasises formal communication channels and restricts employees' self-determination, which means employees only can work in regulated routines and process relevant knowledge. This suggests the interaction of formal and informal coordination mechanisms might become nonsignificant if their working routines conflict within the same event or objective.

Concurrently testing the moderating roles of centralisation and formalisation on the indirect relationship, this research found their moderating roles work significantly except (1) formalisation has a low-level value and centralisation has a mean value and (2) formalisation has a low-level value and centralisation has a high-level value. This suggests a low-level formalisation is difficult to benefit frontline employees' ambidexterity except configured with a low-level centralisation. These findings respond to the calls for more studies on different configurations of coordination mechanisms in ambidexterity literature (Chang & Hughes, 2012; Mom et al., 2009) and provide a valuable extension.

Managerial Implications

Our research offered several practical insights for practitioners. It contributes to develop a more appropriate and effective tool for successful change management. For frontline employees, achieving ambidexterity requires a leadership style that balance exploration and exploitation activities. Paradoxical leadership, where supervisors demonstrate both strong managerial support and high performance expectation, can help achieve this balance. Additionally, informal coordination and connectedness can facilitate this process.

To achieve paradoxical leadership, organisations should train and support supervisors to effectively balance exploration and exploitation activities (Kauppila & Tempelaar, 2016). This can be achieved through training programmes, performance criteria, and organisational context that emphasise the importance of balancing these two activities and encourage supervisors to demonstrate both strong support and high-performance expectations.

To facilitate informal coordination and connectedness, organisations should create opportunities for frontline employees to interact and share information, such as away-days and newsletters. These mechanisms can help build a sense of community and foster collaboration, which can enhance ambidexterity. Additionally, organisations should aim to strike the right balance between formalisation and centralisation, as overly rigid structures can stifle innovation and creativity. Meanwhile, organisations need to avoid concurrently low-level formalisation and centralisation, which will be another type of disaster – overly flexible working context and free working routines will harm employees' ambidexterity.

CONCLUSION

Achieving frontline employees' individual ambidexterity is essential to an organisation's innovation and performance. Facing the paradox between discipline and creativity as the barrier of achieving frontline employees' ambidexterity, this research applied a paradox lens to identify paradoxical leadership, formal and informal coordination mechanisms as antecedents and contingencies. The findings shows that paradoxical leadership can achieve individual ambidexterity directly and indirectly via connectedness, moderated by formalisation. The findings contribute to the conceptualisation of frontline employees' ambidexterity, the antecedents of individual ambidexterity from the configuration of paradoxical leadership and coordination mechanisms, and the process of paradoxical leadership to impact employees' behaviour and activities.

Limitation and Future Directions

This paper is limited in several ways. First, the calculation of individual ambidexterity so far does not have a unified method. Due to the conflicting relationship between exploration and exploitation, this paper views exploration and exploitation as two independent dimensions (He & Wong, 2004), calculating individual ambidexterity as a second-order formative latent variable by multiplying the value of the two dimensions. However, the multiplication measure is insensitive to the balance status of exploration and exploitation (Cao et al., 2009; Rosing & Zacher, 2017). Conversely, some scholars suggested a continuous measure treating exploration and exploitation as two opposing ends of a continuum (e.g., Gupta et al., 2006; Lavie et al., 2010). Different options provide more possibilities and uncertainty of the value of ambidexterity. Future research can consider a combined measure that contains the information of the balance status and the separate value of exploration and exploitation (Kauppila & Tempelaar, 2016), using techniques such as polynomial regression (Rosing & Zacher, 2017), which is suggested to be more comprehensive than difference, sum, and product terms.

Second, the cross-sectional design of the data generates the problem of causality (Yin, 2008). Although the theories applied in this paper suggest the causality relationship, it is possible that reciprocal relationship exist. Future research could use longitudinal or experimental design to create the insights of how the changes of paradoxical leadership and coordination mechanisms and the variation of individual ambidexterity causally relate to each other (Yin, 2008). Third, this paper faces the potential issue of common method bias, as dependent and independent variables were obtained from same sources (Podsakoff et al., 2003). To avoid common method bias, this research performed Harman's one-factor test on items involved in the data analysis (Podsakoff & Organ, 1986). Since a single factor did not emerge in the test, the common method bias is not a serious problem in our research. Future research can apply difference sources of data when conducts multilevel studies.

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