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Agile leadership in the light of efficiency of organizations and the health of employees

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Editorial: Agile leadership in the light of efficiency of organizations and the health of employees

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Editorial on the Research Topic
Agile leadership in the light of efficiency of organizations and the health of employees

The digital age is characterized by rapid progress and constantly changing framework conditions and presents companies with unique challenges that can be described by the acronym VUCA (Volatility, Uncertainty, Complexity, and Ambiguity, see Bennett and Lemoine, 2014; Millar et al., 2018). Organizations are increasingly confronted with sudden and unexpected changes and could cultivate agility as a core capability to navigate these challenges successfully. Key points of agile working can be found in work structures, processes, and ways of cooperation and communication (Crocitto and Youssef, 2003). In 2001, an agile manifesto was published that includes the main statements for agile work (Beck et al., 2001; Hohl et al., 2018). According to these statements, the goal of an agile way of working is to be able to constantly improve oneself and one's work by having constant interactions within the team, collaborating with customers, and being flexible to change.

Looking specifically at leadership in agile working, the role of the leader needs to move away from an instructing control authority to a person who can optimally support employees by giving them the appropriate work resources (Bregenzer and Jimenez, 2021). Leaders define and disseminate a guiding vision, which helps employees in making quick decisions and keeps them focused and inspired toward the desired goal (Parker et al., 2015). Agile leaders must be able to create an innovation-friendly environment where employees can act autonomously, and share knowledge and information to help and support each other (Sherehiy and Karwowski, 2014).

The lack of a standardized definition for agile working beyond the software industry poses a challenge when researching this crucial topic. One article in this Research Topic focuses on measuring agility independently of the work sector. The study of Petermann and Zacher identifies 10 dimensions of workforce agility that measure agility from the employees' point of view. These dimensions can help us better to understand the agility in a specific context or can be used to measure workforce agility in a more general term.

In this Research Topic, leadership behavior and its possible relationships with the agile work environment are highlighted in three articles.

During the present time of adversity, empowering employees is one important aspect that leaders should devote themselves to. Leaders that show empowering behavior toward their employees delegate the authority away from the leader back to the team and support their employees in their personal development and decision-making. Ye et al. showed that employees feel supported, attended, and encouraged by having a leader that offers empowering behavior and a stronger sense of belonging and loyalty.

The study of Kao et al. revealed that transformational leadership behavior and a supportive organization play a beneficial role in shaping the employees' altruistic behavior and organizational citizenship behavior. These behaviors are needed in an agile working environment, as self-initiative and commitment are essential for a good agile way of working.

An innovative approach toward how leadership behavior can be classified regarding today's challenges is presented in the article of Stoker et al., where leadership behavior can be categorized in three archetypes. These archetypes vary in terms of the time leaders spend with their employees and the leader's communication style. These two leadership dimensions are of high value in current challenging times.

Three articles on this special topic provide a more nuanced view of how certain leadership styles can have possible critical and beneficial effects on employee outcomes.

According to Chen and Haga, in the concept of differential leadership, leaders show different leadership behaviors within their team depending on how close their employees are to them. The closeness between leader and team member leads to a division between "insiders" and "outsiders."

In their meta-analysis, Lu et al. explore the relationships between three subdimensions of parental leadership (benevolent leadership, moral leadership, and authoritarian leadership) on the employees' innovation. In today's flexible and challenging work environment, leaders should adjust their weight on each aspect of paternalistic leadership to find the best combination that works in agile teams.

In So's study, the interesting aspect of the manager's overconfidence is investigated. Overconfident managers are overly optimistic and enthusiastic about future projects and prospects and underestimate market risks. In agile organizations, where it is necessary to react quickly and adequately to market changes, this leadership characteristic can have critical effects, therefore, special emphasis on enhancing self-reflection and self-learning among managers should be given.

Contextual factors (e.g., organizational culture, working conditions, diversity) strongly influence leadership behavior. Considering the contextual factors in which leaders can operate holds significant importance in leadership research (Oc, 2018). Four articles deal with the question of how the working environment should be designed to be prepared for today's challenges of the flexible working world.

Weirauch et al. discuss an interesting approach to structuring and managing an organization with the concept of holacracy. In holacratic companies, employees hold roles instead of titles and authority, and possibilities for decision-making are distributed throughout circles, an approach that fits the increasing agile work environment. In such companies, employees feel more appreciated and receive less illegitimate tasks. However, this approach might not fit every person, thus Weirauch et al. stress the importance of a person-organization fit to achieve the best outcomes.

For companies, with a strong focus on customers, where a high level of customer orientation is a priority, agility becomes a crucial resource. In the service sector, where the own emotions have to be regulated constantly and feelings and expressions have to be adjusted to fulfill the customer's needs and wishes, the organization has to give proper support to their employees to be able to deal well with this emotional component. The importance of organizational support especially in the difficult area of the hospitality industry, is highlighted in the study of Hu et al..

Another challenge in today's workplace concerns the issue of temporary employees, where employees are engaged only for a limited period. The study of Xia et al. shows that organizations need to ensure that temporary employees feel accepted and recognized. If that need of belonging is fulfilled, the need to look for another job elsewhere decreases.

Rožman and Milfelner address the important issue of age diversity in organizations. They are studying the relationship between intergenerational leadership and the employee engagement and burnout symptoms in different company sizes. In this study, intergenerational leadership practices have been found to be able to reduce physical burnout, particularly in larger companies.

Finally, one article is devoted to the question of what work attitudes employees should be able to work effectively in today's challenging working world. The study by Rizaie et al. investigated the behavior of employees in hospitals during the COVID-19 outbreak. They contribute to how employee performance can be sustained during these times, especially by exploring the role of organizational citizenship behavior and patriotism.

The articles in this Research Topic provide an in-depth view and give a comprehensive perspective of how the work environment should be designed and of how leaders through promoting agility, should adapt their leadership behavior to allow an innovative, efficient, but also health-promoting work behavior in light of the change of the current working world.

Author contributions

PJ: Writing—original draft. BM: Writing—original draft. AB: Writing—original draft.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Workforce Agility: Development and Validation of a Multidimensional Measure

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The concept of workforce agility has become increasingly popular in recent years as agile individuals are expected to be better able to handle change and uncertainty. However, agility has rarely been studied in a systematic way. Relations between agility and positive work outcomes, such as higher performance or increased well-being, have often been suggested but rarely been empirically tested. Furthermore, several different workforce agility measures are used in the literature which complicates the comparison of findings. Recognizing these gaps in the literature, we developed a new workforce agility measure, compared this measure to established workforce agility measures, and empirically tested the relations of workforce agility with work outcomes. For this purpose, we surveyed participants from two samples ($N_1 = 218$, $N_2 = 533$). In a first step, we used Sample 1 to examine the factor structure of the measure for item selection. In a second step, we used Sample 2 to confirm the 10-factor structure and to compare the predictive validity of our measure along with two other agility measures. Findings demonstrate predictive validity for all three workforce agility scales, especially in relation to innovative performance. Furthermore, workforce agility related positively to task and innovative performance, organizational citizenship behavior, job satisfaction, and well-being.

Keywords: workforce agility, performance, well-being, job satisfaction, agile project management

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INTRODUCTION

Increasingly, unpredictable and far reaching change is shifting the context organizations are currently operating in (Dyer and Shafer, 2003). Due to a soaring level of globalization, higher customer expectations, and an elevated tempo of innovation, markets are getting increasingly dynamic, competitive, and challenging (Breu et al., 2002). In an attempt to overcome these challenges, an increasing number of organizations tend to rely on agile workforces (Sherehiy and Karwowski, 2014), as these have been suggested to provide several benefits to the organization. Agile workforces have been described to be more responsive and competent, as well as to be better able to adapt to new surroundings and circumstances (Zhang and Sharifi, 2000; Breu et al., 2002). They are also expected to boost individual performance (Laanti, 2013; Braun et al., 2017), business growth in the events of unanticipated and constant change (Gehani, 1995), and increase productivity (Goldman et al., 1995). Along with this, it has been assumed that workforce agility has a positive impact on the individuals working in the organization. Employees are expected to have higher levels of well-being, less stress during their work (Laanti, 2013), and a greater overall job satisfaction (Melnik and Maurer, 2006). Consequently, it might be of great value to an organization to build up and foster an agile workforce.

Despite the impact workforce agility is expected to have on organizational functioning as well as the individual employee, it has rarely been studied empirically (Sherehiy and Karwowski, 2014; Muduli and Pandya, 2018). Workforce agility is most often described to consist of two factors: (a) the ability to properly respond to change and (b) the ability to exploit this change (Chonko and Jones, 2005; Alavi et al., 2014). Several workforce agility models and measures are currently used in the agility literature; however, they have often been criticized for their conceptual vagueness. Particularly, Sherehiy (2008) often used three-dimensional framework has been the target of critics as it did not show a good model fit in the original study. Other models such as the model of Petermann and Zacher (2021) lack a measurement and have not been empirically tested. Petermann and Zacher (2021) describe workforce agility as consisting of 10 different dimensions: (a) accept changes, (b) decision making, (c) create transparency, (d) collaboration, (e) reflection, (f) user centricity, (g) iteration, (h) testing, (i) self-organization, and (j) learning. Furthermore, the anticipated positive outcomes such as higher well-being, performance, or satisfaction have only rarely been the target of empirical research. Research so far largely focused on factors influencing agility (Alavi et al., 2014; Sherehiy and Karwowski, 2014; Muduli and Pandya, 2018) and the outcomes of agile methodologies such as scrum (Li et al., 2010; Moe et al., 2010; Laanti, 2013; Tripp et al., 2016; Tuomivaara et al., 2017). It is, therefore, fundamental to compare the different agility measures and to examine the outcomes of an agile workforce on the basis of an empirical study.

Recognizing the current discussion about workforce agility measures, we first aim to develop a new measure for workforce agility based on the model of Petermann and Zacher (2021). We will then compare the newly created measure to the two established workforce agility measures of Braun et al. (2017) and Cai et al. (2018) in regard to predictive validity and model fit. In a third step, we will examine the hypothesis that workforce agility has positive relationship with positive work-related outcomes. Especially the relation of workforce agility to performance (Plonka, 1997; Sherehiy and Karwowski, 2014; Braun et al., 2017) and well-being (Mannaro et al., 2004) was often suggested by the agility literature. Based on this, as well as self-determination theory (Ryan and Deci, 2000), the job characteristics model (Oldham et al., 1976), and the job demand-control model of Karasek (1979), we hypothesize that workforce agility has a positive relation to task performance, innovation performance, organizational citizenship behavior, employee well-being, and job satisfaction. We will test these hypotheses using structural equation modeling with the three workforce agility measures as independent variables and work-related outcomes as dependent variables (**Figure 1**).

Considering that agility and especially the development of an agile workforce is supposed to have a multitude of benefits for the organization as well as the individual employee, it is important that an increased amount of research focuses on this topic. We argue that research and practice will benefit from this study as it offers a new and more specified measurement of workforce agility and compares three workforce agility measures based on their predictive validity toward work-related outcomes. Combined with a clear discussion of the advantages and disadvantage of each scale, this might support future research and organizational practice in choosing the appropriate scale to measure agility in their context. Additionally, this research will increase the understanding of the outcomes of workforce agility in that it will give empirical insights into the proposed relationships of agility with employee well-being, job satisfaction, and performance factors such as task and innovative performance as well as organizational citizenship behavior. These relationships have often been suggested by research, however, have not yet been examined by quantitative research. A clear understanding of the outcomes of agility that can be attained by empirical research might be especially important since many organizations are currently changing their business model to incorporate a more agile way of working to profit from the suggested benefits. Consequently, the agility research is critical to the practitioners in organizations and should focus on explaining the underlying behaviors and structures as well as the outcomes of workforce agility. Our research is, hence, of great value for agility research as well as organizations which seek to understand these relationships better, as it offers them a first orientation about what to expect from a shift toward a more agile workforce.

Workforce Agility

Workforce agility is described by a multitude of different definitions, theories, and conceptualizations in the current literature. It has been described as an ability, as an attitude, and as a set of specific behaviors (Muduli and Pandya, 2018; Salmen and Festing, 2021). However, there seems to be some agreement to describe it as consisting of two main aspects: (a) the ability of a workforce to properly respond to change and (b) the ability to exploit changes to use them as opportunities (Chonko and Jones, 2005; Alavi et al., 2014). This section will provide a short overview over the different conceptualizations currently used in the agility literature.

Breu et al. (2002) described one of the first empirically tested models of workforce agility consisting of the five agile capabilities intelligence (interpret change and being responsive to customer and market needs), competencies (quickly developing new skills and gaining new information), collaboration (effectively cooperating across functional boundaries and projects), culture (empowerment of agility to make independent decisions), and information systems (support of IT infrastructure).

Other models described workforce agility from a behavioral perspective (Sherehiy and Karwowski, 2014) and defined agility as observable performance or behavior at work consisting of the three different dimensions proactivity, adaptability, and resilience. Proactivity consists of initiating behaviors (initiating

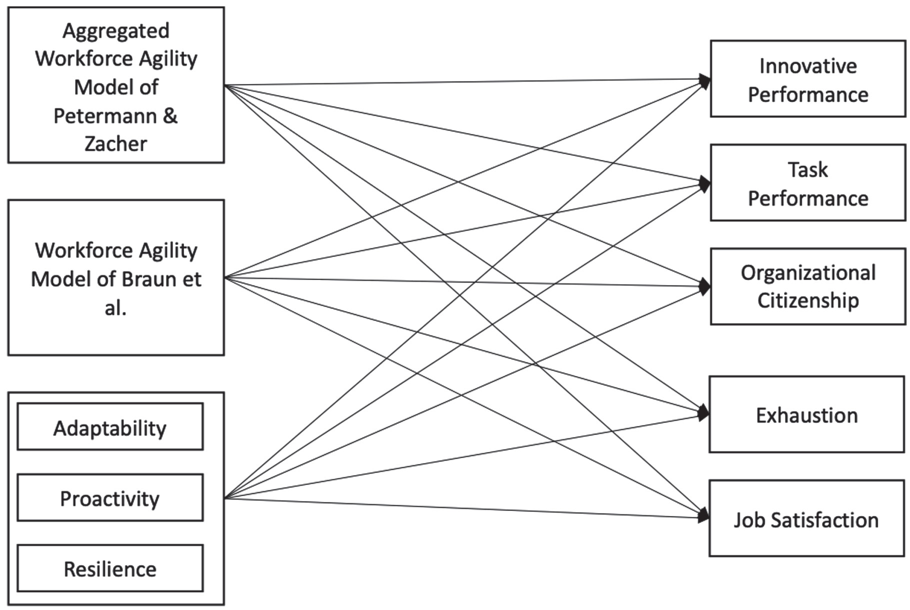

FIGURE 1 | Research model for sample 2.

activities that lead to a solution of a change-related problem) and anticipation behaviors (sensing and anticipating problems) and describes an individual's activities that have a positive impact on the environment. Adaptability consists of learning behaviors (constantly learning new tasks, skills, and procedures), interpersonal adaptability (being able to get along and work with individuals from different professions and backgrounds), and professional flexibility (assuming and changing different roles when needed) and describes an individual's modification to oneself to become a better fit to the environment (Griffin and Hesketh, 2003; Sherehiy and Karwowski, 2014). Lastly, resilience describes an individual's ability to cope in a changing environment and to function effectively in stressful situations. This model is currently very popular in the workforce agility literature and was widely adopted in different research projects (Alavi et al., 2014; Cai et al., 2018; Muduli and Pandya, 2018). Researchers like Alavi et al. (2014) showed that organizational learning, flat organizational structures, decentralization of decision making, as well as psychological availability, meaningfulness, and safety positively relate to workforce agility (Cai et al., 2018). Furthermore, they show that relationship conflict has a negative and task conflict a positive influence on workforce agility (Liu et al., 2015a).

However, there were some conceptual problems with the three-dimensional model which led to several other models of agility currently used in the literature. Muduli and Pandya (2018), for example, used an adapted model of Breu et al. (2002) and considered an agile workforce to be flexible, adaptive, proactive, and resilient but also, to have a positive attitude toward learning and change, to be good problem solvers, very innovative, and to be able adapt new responsibilities, and generate novel ideas. Following the approach of Muduli and Pandya (2018) to define workforce agility as consisting of proactive and adaptive dimensions, Braun et al. (2017) defined workforce agility as the skill of individuals to proactively overcome obstacles or create opportunities by rethinking usual approaches. They argued that agile individuals constantly monitor the environment to be able to anticipate and quickly respond to change. Based on this definition, they developed a five-item measurement of workforce agility. Similarly, recent research has provided evidence that workforce agility is a multidimensional construct that can be assessed *via* different dimensions of agility. They considered adaptability and proactivity as agile dimension but subcategorized these dimensions further into the subdimensions resilience, teamwork, coping with change, decisiveness, eagerness to learn, independence, and courage (Doeze Jager-van Vliet et al., 2019). Furthermore, Harsch and Festing (2020) defined agile talents as innovative, mobile, customer orientated, resilient, and adaptable people with a high willingness to learn and perform and who constantly question the status quo.

Recognizing this multitude of different definitions in the agility literature, Petermann and Zacher (2021) developed a taxonomy of the agile workforce. This taxonomy was developed based on concept mapping as well as the critical incident technique and consists of 10 different dimensions. These dimensions include as: (a) accept changes, (b) decision making, (c) create transparency, (d) collaboration, (e) reflection, (f) user centricity, (g) iteration, (h) testing, (i) self-organization, and (j) learning. For the exact definitions of the 10 dimensions, please see **Table 1**. All of these dimensions relate to a formative higher order factor workforce agility which will be the base of the conducted research. In contrast to reflective measures, the direction of the relationship in formative measures runs from the measure to the construct and not vice versa (Diamantopoulos et al., 2008). We used a formative higher

TABLE 1 | The workforce agility model of Petermann and Zacher (2021).

Dimensions	Description
Accept changes	This dimension concerns the revision of previous decisions due to other new information as well as the acceptance of different roles and situations. It further contains the ability to flexible, quickly and successfully adapt to changing circumstances.
Decision making	This dimension concerns the ability of people to tolerate risks, prioritize, react and decide quickly and proactively. It further contains the ability of people to take responsibility for their actions.
Create transparency	This dimension concerns quickly sharing information, admitting to mistakes, asking for help or information as well as direct communication preferably face to face.
Collaboration	This dimension concerns the creation of agreements as well as the adherence to these agreements and to rules. It further contains that remembers go along with decisions that were made by the team and trust each other. It suggests a collaboration that is cross functional, open, dynamic and works beyond team boarders. Lastly it concerns the deferment from egoistic behavior, the valuing of others and an empathic behavior.
Reflection	This dimension concerns questioning current behaviors, reflecting the collaboration and constantly looking for improvements in the work.
User centricity	This dimension concerns constantly integrating the customer in the project and collecting and including feedback of the customer. It further, puts the value for the customer in the center of attention and integrates them in the development process.
Iteration	This dimension concerns developing a project in a stepwise manner, make continuous improvements and to act in short adaptive cycles.
Testing	This dimension concerns the regular testing of a product as well as the building of a prototype, experimenting and trying out new things. It does not include the test of a method.
Self-organization	This dimension concerns the commitment of the team members and the willingness to manage structure and organize themselves.
Learning	This dimension contains the necessity for constant education as well as a good knowledge management and the possibility to learn from others.

order factor instead of a reflective factor as we suspect that the 10 dimensions are causes of workforce agility rather than caused by it. This means that we argue that workforce agility, or in other words the ability to correctly respond to and exploit change, is caused by behaviors such as quick decision making, cooperation, or reflection instead of the other way around.

Workforce Agility and Performance

Research has provided evidence that work performance consists of more than the direct fulfillment of one's job but also of, for example, driving change in the organization or cooperating with others (Welbourne et al., 1998). It can be investigated as a single higher order factor or as a multidimensional construct (Viswesvaran and Ones, 2000). In this research, we will use a multidimensional construct instead of one global factor as we want to examine the influence of workforce agility on the different performance dimensions. We expect workforce agility to be positively related to specific work performance factors such as innovative performance, task performance, and organizational citizenship behavior. For this, we will consider three different psychological theories: First, we will consider self-determination theory (Ryan and Deci, 2000), second, we will consider the job characteristics model of Oldham et al. (1976), and third, we will consider the job demand-control model of Karasek (1979).

Self-determination theory argues that humans possess three basic psychological needs: the need for autonomy, the need for competence, and the need for relatedness (Ryan and Deci, 2000). These needs have been shown to be positively related to several positive work outcomes such as performance (Gagne and Deci, 2005; Deci and Ryan, 2008). We argue that workforce agility is directly related to the psychological needs described by the self-determination theory and with that relate to employee performance. An example of this relation would be the agile behavioral dimensions of learning, reflection, or decision making that might be positively related to the need for competence.

Additionally, we argue that workforce agility relates to different dimensions of the job characteristics model of Oldham et al. (1976). The job characteristics model describes five core job dimensions: skill variety, task identity, task significance, autonomy, and feedback. These have also been associated with positive job outcomes such as performance, work satisfaction, or well-being (Oldham et al., 1976; Fried and Ferris, 1987). We argue that workforce agility enriches job tasks of employees, as agile work behaviors provide constant feedback from customers as well as team members through reflection practices and user inclusion. Furthermore, it grants a great amount of autonomy through self-organizing mechanisms and behaviors, highlights the significance of the individual tasks by constantly relating them back to the whole project, requires a great variability of tasks such as customer communication, project management, or product testing, and creates identifiable work pieces through short and stepwise work cycles. Subsequently, we propose that workforce agility relates to positive work outcomes such as performance, satisfaction, or well-being.

Finally, we will consider the job demand-control model of Karasek (1979). This model argues that psychological strain results from the joint effect of the job demand and the control, e.g., the decision-making freedom the worker has over the situation. The individuals control over the situation is the variable that distinguishes if a worker experiences high stress or if the worker experiences the work as an active job, when faced with high job demands. High control in the form of a high decision-making latitude has been related to a lower level of work stress and consequently a higher well-being of workers, but also to several other positive work outcomes such as performance, organizational commitment, or task enjoyment (Karasek, 1979; Bakker et al., 2010). We argue that workforce agility positively relates to the degree of control felt by the worker as different dimensions such as decentralized decision making or self-organization are continuously named as dimensions of agility. Similarly to our argumentation based on self-determination theory and the job characteristics model, the consideration of the job demand-control model leads us to the expectation that workforce agility has a positive relation to different work outcomes such as performance or well-being.

In line with the theoretical background, research has often proposed that workforce agility is related to different performance criteria. For instance, Liu et al. (2015b) who found a positive relation of team agility on task performance of teams. This is also supported by the finding of Braun et al. (2017), who found that individual agility significantly influences and predicts the supervisor rated performance of employees. In addition to task performance, workforce agility has often been related to innovative performance (Doeze Jager-van Vliet et al., 2019; Harsch and Festing, 2020). Individuals in an agile workforce have been described to be good problem solvers, to be able to quickly learn new skills, to be highly innovative, and to be better able to cope with new situations, setbacks, or uncertainty (Plonka, 1997; Sherehiy and Karwowski, 2014; Braun et al., 2017). In line with this description of an agile workforce, Abrishamkar et al. (2021) found that workforce agility positively relates to product innovation and consequently to a higher likelihood of an organization becoming a high-tech manufacturing firm. On an organizational level, McCann et al. (2009) found a significant positive relationship between organizational agility and performance. They argued that agility makes companies more competitive which in turn leads to an increase of profitability. Similarly, Pulakos et al. (2019) found the organizational characteristics stability, rightsized teamwork, and relentless course correction to be directly related to agility which in turn had a positive effect on the financial performance of a company. Lastly, research considering agile methodologies showed a relation between agility and performance. Laanti (2013) found that 64% of teams that were adapting to the agile methodologies scrum or Kanban felt that their performance did increase after taking the methodologies into use. Peeters et al. (2022) studied 97 agile teams and found that the agile way of working positively relates to team performance and engagement. Similarly, a case study by Mann and Maurer (2005) observed a higher subjective work quality as well as an increased customer satisfaction for teams working with the agile methodology scrum, over the course of 2 years. These results were also supported by a case study by Li et al. (2010), who found that the introduction of scum in an organizational setting led to a more efficient software development process as well as higher quality. Contrary to these findings, Annosi et al. (2015) found that time pressures that were induced by the implementation of agile methodologies, especially scrum methodology, can lead to less team engagement in learning and innovation activities.

Taken together, we expect agility to be positively related to the performance factors task performance, organizational citizenship behavior, and innovative performance. Task performance concerns the quality, quantity, and accuracy of work as well as the customer service. We expect workforce agility to positively relate to task performance as agile individuals have been seen to produce higher quality of work (Mann and Maurer, 2005) and have been found to be better able to observe, anticipate, and meet customer needs (Chonko and Jones, 2005). Organizational citizenship behavior concerns helping others and working for the overall good of the company. We argue that agility relates to organizational citizenship behavior as it was proposed that an agile workforce is better able to collaborate across functional, team, and department boarders to utilize all existing recourses (Sherehiy and Karwowski, 2014). Lastly, innovative performance concerns finding and implementing new ideas or new ways of working. We argue that workforce agility has a strong positive relationship with innovative performance as an agile workforce regularly reflects their processes and searches for improvements, continuously tests and experiments with new ideas, and acts in short iterations (Petermann and Zacher, 2021).

> *H1*: Workforce agility is positively related to (a) task performance, (b) organizational citizenship behavior, and (c) innovative performance.

Workforce Agility and Well-Being

Following our argumentation about workforce agility and its relation to self-determination theory, the job characteristics model, and the job demand-control model, we expect agility to be positively related to well-being and job satisfaction. All of these models have been linked to several positive work outcomes including an increased job satisfaction, lower emotional distress, and a lower likelihood to burn out (Karasek, 1979; Spector, 1986; Fried and Ferris, 1987; Schaufeli and Bakker, 2004; Deci and Ryan, 2008). This is also supported by the findings of Tripp et al. (2016), who found that agile methodology positively influences the job design criteria job autonomy, feedback, skill variety, task identity, and task significance. We, therefore, expect a positive relationship between workforce agility and well-being.

This is partially supported by the current literature. Whereas Braun et al. (2017) found an interaction effect of resilience and agility on stress and proposed that an increase of agility without a simultaneous increase of resilience might have a negative impact on employees stress level, other authors did not find any effect of agility on stress levels (Laanti, 2013) or observed a positive relationship between the use of agile methodology and well-being (Mannaro et al., 2004; Tuomivaara et al., 2017). Mannaro et al. (2004) found that the adoption of an agile method led to higher job satisfaction and to lower perceived stress of the employees. Furthermore, Tuomivaara et al. (2017) argued that agile teams were able to work in a more sustainable pace which led to better recovery times and to lower perceptions of stress in the end of working periods. In line with this, Mann and Maurer (2005) found that the amount of overtime decreased in projects that adopted an agile method as the new way of working and that the working mode shifted toward a more sustainable pace. Lastly, Rietze and Zacher (2022) found that agile work practices have a negative effect on emotional fatigue by lowering work demands and a positive effect on emotional engagement through higher job resources. As the current state of the literature is somewhat inconclusive, we will examine the relationship between workforce agility and well-being further in this research. Well-being at work has been indexed by a number of variables. For this study, we choose job satisfaction and job exhaustion.

H2: Workforce agility is positively related to (a) job satisfaction and negatively related to (b) job exhaustion.

MATERIALS AND METHODS

Participants and Procedure

We used two different samples for this research. The first sample was used for a first confirmatory factor analysis to test of our proposed workforce agility construct and adapt the measure on the basis of this test. The second sample was used to validate these adaptions and to examine the relations of workforce agility with the outcome performance, well-being, and job satisfaction.

Sample 1 consisted of 218 participants of which 77 were managers and 141 were employees that worked in the production of a big manufacturing company. The participants were invited to participate *via* an email link by the head of human resources, using the third-party survey provider "Interview." Participants were asked to fill the online survey on their work computers during their workday and answer a number of questions about themselves and their work. Please see **Table 2** for the demographic data. Due to data protection, reasons of the company questions about organizational tenure and gender were not asked in this survey.

Sample 2 consisted of 533 participants of which 160 were managers and 373 were employees that either worked in a big manufacturing company and were invited to participate *via* an email link by the head of human resources (412 participants) or were recruited *via* a free link in an online network for systemic coaches (121 participants). All participants were asked to fill in the online survey using the third-party survey provider "Interview" and answer a number of questions about themselves and their work. Please see **Table 2** for the demographic data. Due to data protection reasons of the manufacturing company, only the participants recruited from the systemic network were asked about their gender and their occupation. The occupational background was diverse with 36 different occupations named by the participants.

TABLE 2 | Demographic data.

	Sample 1 (%)	Sample 2 (%)
Age in years		
Under 25	2	3
25–34	17	20
35–44	20	22
45–54	31	30
55–60	22	20
Degree		
Doctoral	6	7
Master's	24	40
Bachelor's	11	21
High school	4	9
Middle school	17	17
General education	4	6
Gender		
Female	-	41
Male	-	59

Measures

All English items were translated into German by two native speakers using the translation retranslation method. This means one native speaker translated the item into German and the other translated this item back into English. This way we were able to check if the translation was correct.

Workforce Agility I

We used the 10 dimensions of the workforce agility model by Petermann and Zacher (2021) to design a measure for workforce agility. For each dimension, 5 to 9 items were generated by the first author on the basis of the exact definition and the subcategories in the model. The items were then checked by the second author. An exception to this was the measurement of self-organization. We used the self-organization scale of Rousseau and Aubé (2010) as it showed a good fit and high reliabilities in previous studies. The self-organization scale was adapted in order to fit an individual scale. This procedure resulted in a measure of 68 questions for the concept of workforce agility. The participants of the first sample were asked to rate these questions in regard to their daily work using a 5-point scale from 1 (seldom) to 5 (very often / always). We then proceeded to calculate the item intercorrelations, the correlations of each item with the average of the other items belonging to the scale, and we conducted a confirmatory factor analysis with Sample 1. Subsequently, we selected the three items with the best fit, taking intercorrelations, correlations with the scale score, and factor loadings of every dimension into account, choosing the highest score while checking that the score did not exceed 0.9. All intercorrelations were in the range between 0.27 and 0.83 with a mean of 0.51 and a SD of 0.16. Furthermore, we compared the results of several confirmatory factor analyses to test whether the 10 dimensions proposed by Petermann and Zacher (2021) are distinct dimensions of workforce agility. For this, we used several theoretically deduced models with nine or eight factors as well as a one-factor model (**Table 3**). The comparison of the different models showed that the proposed item structure with 10 factors was the best fit for the data [$\chi^2(360) = 546.291$; RMSEA = 0.049; CFI = 0.925; TLI = 0.909]. This was validated again *via* a second confirmatory factor analysis using the second sample of 533 employees that showed support for the 10 dimensional structure of workforce agility [$\chi^2(360) = 559.133$; RMSEA = 0.032; SRMR = 0.039 RCFI = 0.961; RTLI = 0.953].

We chose a model of workforce agility that was formative instead of reflective. Contrary to a reflective measure, in formative measurement, the direction of the relationship runs from the measure to the construct and not vice versa (Diamantopoulos et al., 2008). Hence, a change of any of the

TABLE 3 | Results confirmatory factor analysis sample 1.

	Test statistic	Df	P	RMSEA	CFI	TLI
One-factorial model	1737.937	405	<0.001	0.123	0.452	0.411
Nine factorial model (iteration and test one factor)	687.803	369	<0.001	0.063	0.871	0.847
Nine factorial model (decision and user one factor)	646.733	369	<0.001	0.059	0.887	0.886
Eight factorial model (iteration and test/learning and transparency one factor)	738.234	377	<0.001	0.066	0.853	0.831
Nine factorial model (transparency and learning one factor)	596.699	369	<0.001	0.053	0.908	0.891
Nine factorial model (collaboration and self-organization one factor)	630.606	369	<0.001	0.057	0.894	0.875
Nine factorial model (learning and self-organization one factor)	581.709	369	<0.001	0.051	0.914	0.898
Ten factorial model	546.291	360	<0.001	0.049	0.925	0.909

dimensions changes the overall construct (Diamantopoulos and Siguaw, 2006). As we assumed that the theoretical construct of workforce agility is defined by a combination of the 10 observable behaviors and a change in one of these measures would result in a change of the overall construct and not vice versa, we decided to use a formative construct. We, therefore, aggregated the 10 dimensions into one overall score of workforce agility to avoid committing a Type I error due to the large number of statistical tests (Diamantopoulos and Siguaw, 2006). To aggregate the dimensions, we followed the approach of Edwards (2001) and added all dimensions up to create one aggregated causal construct of workforce agility. This led to an overall construct consisting of the sum of 10 dimensions described in the model of Petermann and Zacher (2021) measured by 3 items each (please see **Table 4** for the complete scale). As it is not appropriate to compute internal consistency estimates for constructs with formative measures, we did not compute Cronbach's alpha values (Edwards, 2001). However, we computed Cronbach's alpha values, standard deviations, and means for the 10 dimensions of workforce agility. These are depicted in **Table 5**.

Workforce Agility II

Furthermore, we used the workforce agility scale from Cai et al. (2018) as a second measure of workforce agility. This scale is the latest version of the most popular scale in workforce agility research, which was originally developed by Sherehiy (2008). According to a recent literature review, adaptions of Sherehiy's scale have been used in 13 out of 31 studies examining agility (Salmen and Festing, 2021). The scale uses a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree) and consists of 15 items divided in the three dimensions proactivity, adaptivity, and resilience. Examples of the items are "I am trying to find out more effective ways to perform my job," "In my work, I can accept critical feedback," and "I am able to perform my job efficiently in difficult or stressful situations." Cronbach's alpha for the dimension proactivity 0.61, for the dimension adaptivity 0.80, and for resilience 0.68.

Workforce Agility III

Additionally, we used the workforce agility scale from Braun et al. (2017). This scale has also been shown to have a good reliability and validity. It consists of 5 items and is measured on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Examples for these items include as: "I am always thinking about what we need to do differently to meet upcoming change" or "In the last month, I have proposed a change about our work to my leader." Cronbach's alpha for this study is 0.86.

Job Performance Scale

We use the performance scale of Welbourne et al. (1998). This performance scale divides performance into different roles: (a) the task role, concerning the quality, quantity, customer service, and accuracy of work, (b) the organization role, concerning promoting the company, helping others, and work for the overall good of the company, and (c) the innovator role, coming up with and implementing new ideas, finding new ways of doing things, and creating better processes and routines. The scale provides a good fit for our study since it is based on theory, has been shown to be a reliable and valid measure, is relatively short, and has a good face value. Due to our hypotheses, we only used three of the dimensions of performance: (a) Task performance (4 items, e.g., "Accuracy of work"), (b) innovator performance (4 items, e.g., "Coming up with new ideas"), and (c) organizational citizenship behavior (4 items, e.g., "Working for the overall good of the company"). The response scale was a 5-point scale from 1 (needs much improvement) to 5 (excellent). Cronbach's alpha in this study was 0.85 for task performance, 0.92 for innovator performance, and 0.90 for organizational citizenship behavior.

Job Satisfaction

Job satisfaction was evaluated using a one item scale by Wanous et al. (1997). It has been shown that a single item measure for job satisfaction is an acceptable alternative for a multiple item measure. The item we used was "How satisfied are you with your job as a whole?" and was measured on a 7-point scale ranging from 1 (very dissatisfied) to 7 (very satisfied).

Job Exhaustion

Job exhaustion was evaluated using three items from the Maslach burnout inventory (Maslach and Jackson, 1981). The items used were "I feel emotionally drained from my work," I feel fatigued when I get up in the morning and have to face another day in the job," and "I feel burned out from my work" and were measured on a 7-point scale ranging from 1 (never) to 7 (every day). Cronbach's alpha in this study was 0.87.

TABLE 4 | Dimensions and items of the workforce agility scale.

Dimensions	Items	Factor loadings sample (1/2)
Accept changes	1. At work I can quickly adapt to different situations. 2. I am able to assume different roles in my work. 3. If necessary, I find it easy to react to changes.	(0.654 / 0.711) (0.741 / 0.621) (0.713 / 0.697)
Decision making	1. I often delay important decisions longer. (Inverted) 2. I am already making decisions that lead to solutions for the problems of the future. 3. I like to take responsibility for topics at work.	(0.398 / 0.340) (0.568 / 0.547) (0.639 / 0.692)
Create Transparency	1. I actively share all information I have. 2. When I have a question I often go directly to the relevant person. 3. I ask colleagues outside my immediate environment for new information.	(0.624 / 0.457) (0.417 / 0.543) (0.423 / 0.465)
Collaboration	1. I regularly show my appreciation for others. 2. I can respond well to the feelings and emotions of others. 3. I enjoy working together with others.	(0.739 / 0.713) (0.676 / 0.657) (0.695 / 0.607)
Reflection	1. At work I think about how things could be done differently. 2. I question how we could improve our cooperation. 3. I am looking for new possibilities and tools to improve my procedures and processes.	(0.818 / 0.789) (0.748 / 0.798) (0.818 / 0.759)
User centricity	1. Customer feedback is one of the most important things to improve our product. 2. The customer is an important part of our project. 3. The customer perspective is actively included in our decision-making processes.	(0.750 / 0.705) (0.882 / 0.826) (0.767 / 0.771)
Iteration	1. We constantly question our product in order to improve it. 2. We try to develop the product step by step, so that we can always assess whether we are still on the right track. 3. In unserem Entwicklungsprozess wechseln sich kurzzyklisch Entwicklung und Evaluation ab.	(0.814 / 0.802) (0.689 / 0.622) (0.689 / 0.660)
Testing	1. We test every product before we make it public. 2. Without testing a product, we do not let it go on the market. 3. Product tests are an integral part of our development process.	(0.913 / 0.892) (0.891 / 0.805) (0.859 / 0.819)
Self-organization	1. I monitor the results of my work. 2. I am looking for better ways to do my job. 3. I introduce new methods to do my work.	(0.418 / 0.431) (0.727 / 0.802) (0.744 / 0.781)
Learning	1. I place great value on always learning new things. 2. I am constantly expanding my skills. 3. It is important for me to expand my knowledge.	(0.656 / 0.816) (0.821 / 0.655) (0.645 / 0.700)

Analysis

We applied structural equation modeling with latent and manifest variables using the RStudio package lavaan to test our hypotheses. Structural equation modeling (SEM) was considered appropriate for our model since we wanted to test a complex model that contains several latent and mediating variables. SEM is a theory-driven method and an effective way to explain the relationship between multiple variables when the model that is tested is a path analytic model that consists of several latent constructs and mediating variables which are measured by multiple indicators (Tabachnick and Fidell, 2014). This analytic approach enabled us to examine the effects in relation to each other. Furthermore, it enabled us to show the complete model with all dependent and independent variables in one model. We used robust maximum likelihood (MLR) as estimator in our model, given that we saw some deviations from the normality criterion, and this estimator is relatively robust against nonnormality. The variables innovation performance, task performance, organizational citizenship behavior (four indicator variables each), and job exhaustion (three indicators) were added as latent variables to the model, job satisfaction was added as observed variable. We used the scale of Petermann and Zacher (2021) as independent variable for workforce agility and added it to the model as an observed variable that was constructed using the sum of all 10 dimensions of the workforce agility construct (Edwards, 2001). In a first step, we used confirmatory factor

TABLE 5 | Means, standard deviations, and Cronbach's alpha in sample 2.

	Mean	SD	Cronbach's alpha
Accepting changes	4.22	0.52	0.71
Decision making	3.79	0.59	0.52
Creating Transparency	4.02	0.50	0.49
Collaboration	4.14	0.57	0.69
Reflection	4.05	0.65	0.82
User centricity	4.04	0.77	0.81
Iteration	3.43	0.73	0.74
Testing	3.88	1.01	0.88
Self-organization	4.05	0.61	0.70
Learning	4.34	0.54	0.76

analysis to determine the fit of the aggregated scale. This was done by adding only the aggregated factor of agility and the outcome variables to the model and comparing this model to a model using all 10 workforce agility dimensions as independent variables. In a second step, we computed a full model adding the workforce agility construct of Braun et al. (2017) and the three-dimensional construct of Cai et al. (2018) as measure for workforce agility. For this, we added the dimensions of Braun et al. (2017; 5 indicators) and of Cai et al. (2018; proactivity 5 indicators, adaptability 6 indicators, and resilience 4 indicators) as latent variables to the model. Latent variables in all the models were allowed to correlate. The fit of our model was evaluated using the chi-square statistic, root square error of approximation (RMSEA) below 0.06 (Hu and Bentler, 1999), the comparative fit index (CFI) above 0.95, the standardized root mean squared residual (SRMR) below 0.08, and the Tucker-Lewis Index (TLI) above 0.95 (Bentler and Bonett, 1980).

RESULTS

The aggregated construct for workforce agility correlated highly with the dimensions of the workforce agility scale of Cai et al. (2018; proactivity $r = 0.59$, $p < 0.001$, adaptability $r = 0.62$, $p < 0.001$, and resilience $r = 0.48$, $p < 0.001$) and the workforce agility scale of Braun et al. (2017; $r = 0.62$, $p < 0.001$). **Table 6** presents descriptive statistics and the correlation matrix for all variables used in the regression model.

The model examines relation of workforce agility on five different outcome variables. We hypothesized that workforce agility is directly related to the job-related factors innovative performance, task performance, organizational citizenship behavior, job exhaustion, and job satisfaction. The first model using only the aggregated factor of workforce agility as independent variable indicated a good fit [$\chi^2(106) = 270.469$; RMSEA = 0.058; SRMR = 0.033; RCFI = 0.966; TLI = 0.957]. We then compared this model to a model in which we placed all 10 workforce agility dimensions as independent variables [$\chi^2(885) = 1450.567$; RMSEA = 0.036; SRMR = 0.043; CFI = 0.946; TLI = 0.937]. The comparison of the models using a chi-square difference test shows that the model with the aggregated indicator of workforce agility shows the better fit [$\chi^2(779) = 1171.7$, $p < 0.001$]. This is in line with our prediction that workforce agility is a multidimensional construct and we proceeded to use the aggregated workforce agility construct to calculate the full model. The full model using all three workforce agility measures did only show a marginal fit [$\chi^2(590) = 15414.945$; RMSEA = 0.055; SRMR = 0.101; RCFI = 0.895; RTLI = 0.881; **Table 7**]. This was expected in the design since we used three scales measuring the same construct. We will proceed to use the values from the full model to gain a direct comparison of the three measures in terms of their predictive validity. We will, however, shortly mention if each measure taken separately is significantly related to the outcome of every hypothesis. To get an exact depiction of the beta values and

TABLE 6 | Means, standard deviations, correlations, and Cronbach's alphas for Sample 2.

	Mean	*SD*	1	2	3	4	5	6	7	8	9	10
1. Workforce agility (based on Petermann and Zacher, 2021)	40.1	3.80	-									
2. Innovative performance	3.88	0.71	0.44**	(0.92)								
3. Task performance	4.15	0.56	0.30**	0.63**	(0.85)							
4. Organizational citizenship behavior	4.15	0.60	0.35**	0.67**	0.65**	(0.90)						
5. Job exhaustion	2.65	1.15	−0.15**	−0.18**	−0.11*	−0.21**	(0.87)					
6. Job satisfaction	5.55	1.16	0.16**	0.23**	0.16**	0.20**	−0.23**	-				
7. Workforce agility (Braun et al., 2017)	3.49	0.75	0.62**	0.42**	0.24**	0.27**	−0.13	0.12**	(0.86)			
8. Proactivity	4.21	0.45	0.59**	0.33**	0.25**	0.29**	−0.23**	0.11**	0.46**	(0.61)		
9. Adaptability	4.15	0.46	0.62**	0.38**	0.37**	0.36**	−0.19**	0.11**	0.43**	0.54**	(0.80)	
10. Resilience	3.93	0.51	0.48**	0.31**	0.26**	0.26**	−0.16**	0.06	0.35**	0.45**	0.58**	(0.68)

SD is used to represent standard deviation. Proactivity, adaptability, and resilience were measured with the workforce agility scale by Cai et al. (2018).
$*p<0.05$; $**p<0.01$.

TABLE 7 | Model fits for the CFA with sample 1 and sample 2 and the regression analysis.

	Test Statistic	Df	*P*	RMSEA	CFI	TLI
CFA Sample 1 Workforce agility	546.291	360	< 0.001	0.050	0.925	0.909
CFA Sample 2 Workforce agility	559.133	360	< 0.001	0.032	0.961	0.953
CFA Sample 2 Regression Analysis	1541.945	590	< 0.001	0.058	0.895	0.881

significance levels for each model, please see **Tables A1–A3** in the **Appendix**.

Hypothesis 1 predicted that workforce agility is significantly related to the performance dimensions (a) task performance, (b) organizational citizenship behavior, and (c) innovative performance. All three workforce agility measures were significantly related to all three performance dimensions when taken separately. When added in the same model only the adaptability ($B = 0.553$, $SE = 0.193$, $\beta = 0.355$, $z = 2.865$, $p = 0.004$) and the resilience ($B = 0.153$, $SE = 0.077$, $\beta = 0.154$, $z = 2.002$, $p = 0.045$) dimension of the model of Cai et al. (2018) significantly related to task performance. The adaptability dimension of Cai et al. (2018; $B = 0.485$, $SE = 0.195$, $\beta = 0.315$, $z = 2.488$, $p = 0.013$) and the measure of Petermann and Zacher (2021; $B = 0.027$, $SE = 0.011$, $\beta = 0.178$, $z = 2.564$, $p = 0.010$) significantly related to organizational citizenship behavior, and only the workforce measure of Petermann and Zacher (2021; $B = 0.030$, $SE = 0.011$, $\beta = 0.169$, $z = 2.719$, $p = 0.007$) and of Braun et al. (2017; $B = 0.302$, $SE = 0.079$, $\beta = 0.262$, $z = 3.797$, $p < 0.001$) significantly related to innovative performance.

According to Hypothesis 2, workforce agility is positively related to (a) job satisfaction and negatively related to (b) job exhaustion. When taken separately, the measure of Petermann and Zacher (2021) and the measure of Braun et al. (2017) were positively related to job satisfaction and the measure of Petermann and Zacher (2021) and the resilience dimension of the measure of Cai et al. (2018) were significantly related to job exhaustion. When added in the same model, no measure significantly related to job satisfaction and only the resilience component of the model of Cai et al. (2018) significantly related to job exhaustion ($B = -0.327$, $SE = 0.143$, $\beta = -0.178$, $z = -2.286$, $p = 0.022$) (**Table 8**).

DISCUSSION

The aim of this study was to develop a new measurement of workforce agility based on the model of Petermann and Zacher (2021), compare this model to two established workforce agility measures of Braun et al. (2017) and Cai et al. (2018) in regard to their predictive validity and model fit, and to examine the hypothesis that workforce agility has positive relationship with work-related outcomes. The literature to date has suggested several factors that are related to workforce agility, but empirical testing has been sparse. Our findings support the previous literature about workforce agility in that they provide empirical evidence for the suggested relations of workforce agility with work-related outcomes. As hypothesized innovative performance, organizational citizenship behavior, task performance, job satisfaction, and job exhaustion were all found to be related to workforce agility.

The construction and validation of the measurement for workforce agility add to the previous literature in that it provides a specific measurement based on 10 different dimensions that shows a good model fit and high predictive validity toward work-related outcomes. An advantage of the new model is that it was constructed based on an open and integrating approach presenting an opportunity to integrate several models and conceptualizations. It, thus, answers the call of Sherehiy (2008) that asked for a model and measure with several specified dimensions instead of three more global ones. In contrast to other measures, this measurement is based on 10 specific behaviors which might offer new insights into the exact components of workforce agility that influence certain outcomes and could, therefore, allow for more detailed inferences about the relations of single dimensions with different outcome variables in the future. At the same time, the measure provides an aggregated factor that strongly correlates with previously validated measures of workforce agility and can, thus, be used to measure workforce agility in a more general term.

The comparison of the new measure with the two established workforce agility scales of Braun et al. (2017) and Cai et al. (2018) showed mixed results. All three measures correlated highly with each other and showed significant relations with the outcome variables when considered separately. When compared in the same model, however, different strength and weaknesses became apparent. Arguably, the most important outcome of agile workforce behavior innovative performance was, for example, only significantly related to the scale of Petermann and Zacher (2021) and the scale of Braun et al. (2017), whereas task performance and job exhaustion only related to the model of Cai et al. (2018). In general, the model of Cai et al. (2018) seemed to be the best predictor for most of the chosen outcome variables with the exception of innovative performance. All the scales showed a good model fit in the separate models. We want to note, however, that the confirmatory factor analysis of the model of Cai et al. (2018) did not show a good fit. This fit could be improved by deleting the two inverted items of the proactivity dimensions as well as item four of the resilience dimension. Furthermore,

TABLE 8 | Results of regression analyses.

Variables	*B*	*SE*	*β*	*z*	*p*	R^2
Innovative performance						0.209
Proactivity	−0.004	0.165	−0.003	−0.027	0.978	
Adaptability	0.194	0.216	0.106	0.901	0.368	
Resilience	0.167	0.096	0.143	1.730	0.084	
Workforce agility (Braun et al., 2017)	0.302	0.079	0.262	3.797	< 0.001	
Workforce agility (Petermann and Zacher, 2021)	0.030	0.011	0.169	2.719	0.007	
Task performance						0.175
Proactivity	−0.224	0.139	−0.179	−1.606	0.108	
Adaptability	0.553	0.193	0.335	2.865	0.004	
Resilience	0.153	0.077	0.154	2.002	0.045	
Workforce agility (Braun et al., 2017)	0.099	0.067	0.101	1.480	0.139	
Workforce agility (Petermann and Zacher, 2021)	0.009	0.010	0.059	0.876	0.381	
Organizational citizenship						0.138
Proactivity	−0.236	0.146	−0.191	−1.621	0.105	
Adaptability	0.485	0.195	0.315	2.488	0.013	
Resilience	0.079	0.075	0.081	1.054	0.292	
Workforce agility (Braun et al., 2017)	0.120	0.069	0.124	1.738	0.082	
Workforce agility (Petermann and Zacher, 2021)	0.027	0.011	0.178	2.564	0.010	
Exhaustion						0.060
Proactivity	−0.079	0.245	−0.034	−0.322	0.747	
Adaptability	−0.292	0.315	−0.101	−0.930	0.352	
Resilience	−0.327	0.143	−0.178	−2.286	0.022	
Workforce agility (Braun et al., 2017)	0.223	0.143	0.122	1.560	0.119	
Workforce agility (Petermann and Zacher, 2021)	−0.016	0.021	−0.055	−0.734	0.463	
Work satisfaction						0.021
Proactivity	0.332	0.291	0.119	1.140	0.254	
Adaptability	−0.091	0.345	−0.026	−0.265	0.791	
Resilience	−0.006	0.165	−0.002	−0.034	0.973	
Workforce agility (Braun et al., 2017)	−0.030	0.176	−0.014	−0.172	0.864	
Workforce agility (Petermann and Zacher, 2021)	0.039	0.024	0.114	1.629	0.103	

Proactivity, adaptability, and resilience were measured with the workforce agility scale by Cai et al. (2018).

it should be noted that the length of the scales differed significantly.

Additionally, this research now provides insights into the relation of three different performance factors with workforce agility. Particularly, a positive relation with innovative performance has often been hypothesized due to an agile workforces ability to cope well with new situations, master uncertainty, learn and acquire new skills quickly, and find good solutions for new problems (Braun et al., 2017; Doeze Jager-van Vliet, 2017; Harsch and Festing, 2020). The results of our study support this hypothesis and show that there is a strong positive relation between workforce agility and innovative performance. We also found a positive relation of workforce agility with task performance and organizational citizenship behavior. This is also in line with previous research that suggested that an agile workforce produces higher quality of work (Mann and Maurer, 2005), is better able to observe, anticipate, and meet the need of a customer (Chonko and Jones, 2005), and collaborates better across functional, team, and department boarders to utilize all existing resources (Sherehiy and Karwowski, 2014).

Other positive work outcomes that were found to be related to workforce agility included job exhaustion and work satisfaction. Job exhaustion was found to be negatively, and job satisfaction positively related to workforce agility. These relations, however, were much weaker than the relations of workforce agility with the performance dimension and, in the case of job satisfaction, vanished when all three workforce agility measures were added in the same model. Our findings are in line with the hypothesis that workforce agility positively relates to well-being (Mannaro et al., 2004; Tuomivaara et al., 2017). However, as the effects are small and the literature to date is somewhat ambiguous more research is needed to gain a better understanding.

Theoretical Implications

The results of this study may have implications for further theory development in three ways. First, the newly proposed measure integrates a more general approach into a very specific measurement and can be applied in diverse settings and for different research questions. Taken together with a good model fit and a good predictive validity, we suggest that this scale could be good alternative for measuring workforce agility. Second, we argue that this research adds to the literature in that it tests and expands the agility theories of Sherehiy (2008) and Braun et al. (2017). Even though agility theories have often been criticized for their model fit as well as their conceptual vagueness, the measures showed a good fit and predicted the proposed outcome variables well. They often criticized three-dimensional model, tested with the measure of Cai et al. (2018), and did show some problems with model fit; however, these problems could be resolved by deleting three items from the scale. Adapting this measure might be a valuable next step in the agility literature since these adaptions seem to fix issues with model fit that did arise in previous studies. This might be especially beneficial since it appeared to be the best predictor of the outcome variables with the exception of innovative performance.

Third, we argue that the concept of workforce agility should be included in future conceptualizations of criteria of performance and especially innovative performance at work. As predicted workforce agility was related to the three considered performance dimensions of the performance model of Welbourne et al. (1998), task performance, innovative performance, and organizational citizenship behavior. We suggest future research could advance the understanding of the relation between agility and performance further by considering performance and especially innovative performance as an outcome of workforce agility. At the same time, our research adds to the innovation literature in that it provides evidence for the proposed relation between workforce agility and innovative performance. Research on team innovation has identified the two main factors that promote a climate for innovation: support for innovation and a climate for excellence (West et al., 2003; Eisenbeiss et al., 2008). We argue that an agile workforce actively creates a climate of innovation in which employees feel free to take initiative, explore, and develop new ideas, as well as regularly test and adapt their products. Thus, workforce agility could be seen as an underlying factor supporting a climate of innovation.

Practical Implications

Our research has might have valuable consequences for organizational practice in two main ways. Organizations can use the measurement to specifically access their current level of agility and organizations can adapt their training and development processes to increase workforce agility to foster positive work outcomes such as a better performance or a higher job satisfaction.

The workforce agility scale constructed and validated by this research could be used in the organizational context in several ways. It could be used in organizational development to assess the level of workforce agility in the organization or in single departments. An assessment based on the specific dimensions of the validated measurement will give an organization an exact depiction of their current workforce agility level in each dimension. This way organizations or departments could tailor development processes exactly to their current agility level and increase the coherence with their agility needs. Modular training could be developed to strengthen the skills of employees in single workforce agility dimensions and increase their overall agility. Moreover, structures and processes could be introduced in order to strengthen single dimensions of workforce agility. An example for this could be to integrate a personalized decision process to improve and speed up decisions. Furthermore, the workforce agility measure might be used by companies during the recruitment process to assess the level of workforce agility for job applicants. This way organizations will be able to select candidates that show a high level of workforce agility and, therefore, show a good fit to or even increase the agility level of the selected position. This could be especially effective if the agility need of the position is assessed before the recruitment process and the agility level of the applicant can be compared to this need.

Limitations and Future Research

This study has a number of limitations which mandate a certain degree of caution when interpreting the results. The first limitation is the cross-sectional design of the study that does not allow for an investigation of the relationship between workforce agility and the outcome variables over time. To tackle this limitation, for at least the validation of the measurement, we compared the results of the confirmatory factor analysis between the two samples. Nevertheless, future research should use longitudinal or experimental study design to investigate the relations between workforce agility and performance, job satisfaction, and job exhaustion. Another limitation concerns the items of the newly created measure. The items measuring the concepts "decision making" and "creating transparency" had low Cronbach's alpha values. It might be fruitful for future research to revise these items to strengthen internal consistency. Lastly, the study is limited by the composition of the sample. The greatest part of the participants came from one manufacturing company in Germany. It might therefore be interesting to validate our findings with a more diverse sample and in other countries.

As the workforce agility literature is still in its early stages, there are several aspects that should be considered by future research. First, contrary to previous conceptualizations, this research defines agility as formative instead of reflective construct. This means that we expect the causality to run from the dimensions toward the agility construct and not vice versa. Together with the fact that we define agility as a multidimensional behavioral taxonomy consisting of 10 behaviors, this approach could initiate a discussion about the causal effects of workforce agility. Future research should further examine the nature and causal effects of the agility construct.

Second, we expect self-determination theory to mediate the relationship between workforce agility and performance as well as its relationship to well-being. Future research examining this question could provide a better understanding of the causality of the effects that were found by this research. It would also be interesting to use an experimental design to look at different agility interventions and their influence on performance and well-being over time. Different interventions could be used to examine their influence on agility and, consequently, the output factors.

Third, future research could further explore the relation between workforce agility and innovation. We suggest that an agile workforce actively creates a climate of innovation which in turn leads to higher innovative performance. Examining this question could lead to a better understanding of the relation between agility and innovative performance and add to the current innovation literature.

Fourth, future research could also look at targeted training and interventions to examine the individual influence of the interventions on agility dimensions as well as on the outcome factors. This could be paired with an experimental study design in which different dimensions are manipulated to compare their impact on agility and organizational functioning. We believe that this study provides a good basis for further investigations in the field of workforce agility. It contributes to the literature by comparing different models and measures of workforce agility and by linking it to performance and well-being.

CONCLUSION

In conclusion, these findings expand previous literature in that they provide empirically measured evidence of the relationship between workforce agility and positive work outcomes. Especially the positive relationship between workforce agility and innovative performance was previously often suggested and could be confirmed by this research. This finding might be particularly important for practitioners who are currently restructuring their organization to become more agile. It may also have implications for the scientific practice as it shows that agility could be included into future conceptualizations of innovative performance. Additionally, this study developed a new multidimensional measure of workforce agility. In a second step, this research compared the new model to different workforce agility measures on the basis of their fit and their predictive validity and discussed how to develop the scales further. We argue that this research could be a good basis for future research in the field of workforce agility as it offers a clear comparison of different agility measures and provides empirical evidence of the relation between workforce agility and positive work outcomes.

DATA AVAILABILITY STATEMENT

The data is only available on request and under individual consideration.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the responsible board at the Daimler AG (Betriebsrat Untertürkheim). The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

MP and HZ contributed to the conception and design of the research. MP conducted the research and statistical analysis, wrote the first draft of the manuscript, and revised the manuscript following feedback. HZ provided feedback and revised the first draft and subsequent versions of the manuscript. All authors contributed to the article and approved the submitted version.

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Conflict of Interest: MP was employed by the company Daimler AG.

The remaining authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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APPENDIX

A1 | Results of the regression analyses using only the scale of Petermann and Zacher (2021).

Variables	*B*	*SE*	*β*	*z*	*p*	R^2
Innovative performance						0.202
Workforce agility (Petermann and Zacher, 2021)	0.085	0.009	0.450	9.197	< 0.001	
Task performance						0.094
Workforce agility (Petermann and Zacher, 2021)	0.047	0.008	0.306	5.754	< 0.001	
Organizational citizenship						0.131
Workforce agility (Petermann and Zacher, 2021)	0.056	0.008	0.361	6.952	< 0.001	
Exhaustion						0.024
Workforce agility (Petermann and Zacher, 2021)	−0.044	0.013	−0.154	−3.284	0.001	
Work satisfaction						0.027
Workforce agility (Petermann and Zacher, 2021)	0.056	0.015	0.163	3.691	< 0.001	

A2 | Results of the regression analyses using only the scale of Braun et al. (2017).

Variables	*B*	*SE*	*β*	*z*	*p*	R^2
Innovative performance						0.221
Workforce agility (Braun et al., 2017)	0.574	0.068	0.479	8.498	< 0.001	
Task performance						0.073
Workforce agility (Braun et al., 2017)	0.270	0.057	0.271	4.731	< 0.001	
Organizational citizenship						0.096
Workforce agility (Braun et al., 2017)	0.312	0.057	0.310	5.428	<0.001	
Exhaustion						0.005
Workforce agility (Braun et al., 2017)	−0.124	0.093	−0.068	−1.338	0.181	
Work satisfaction						0.016
Workforce agility (Braun et al., 2017)	0.285	0.111	0.128	2.561	0.010	

A3 | Results of the regression analyses using only the scale of Cai et al. (2018).

Variables	*B*	*SE*	*β*	*z*	*p*	R^2
Innovative performance						0.227
Proactivity	0.306	0.144	0.198	2.125	0.034	
Adaptability	0.337	0.220	0.175	1.531	0.126	
Resilience	0.209	0.100	0.172	2.100	0.036	
Task performance						0.196
Proactivity	−0.135	0.120	−0.106	−1.129	0.259	
Adaptability	0.602	0.192	0.379	3.128	0.002	
Resilience	0.171	0.076	0.170	1.332	0.025	
Organizational citizenship						0.172
Proactivity	−0.082	0.122	−0.064	−0.674	0.500	
Adaptability	0.611	0.197	0.383	3.107	0.002	
Resilience	0.101	0.076	0.101	1.332	0.183	
Exhaustion						0.067
Proactivity	0.098	0.202	0.042	0.486	0.627	
Adaptability	−0.371	0.301	−0.127	−1.233	0.217	
Resilience	−0.333	0.140	0.181	−2.382	0.017	
Work satisfaction						0.027
Proactivity	0.413	0.225	0.146	1.838	0.066	
Adaptability	0.054	0.338	0.015	0.160	0.873	
Resilience	0.029	0.164	0.013	0.174	0.862	

Proactivity, adaptability, and resilience were measured with the workforce agility scale by Cai et al. (2018).

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The Importance of Intergenerational Leadership Praxes and Availability of Key Information for Older Employee Burnout and Engagement in the Context of Firm Size

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The main aim of this study was to analyze the effects of availability of key information and intergenerational leadership on burnout divided into physical symptoms of burnout and emotional symptoms of burnout and work engagement regarding the firm size during the coronavirus disease 2019 (COVID-19). The empirical study included 583 older employees in Slovenia who participated in the survey during the COVID-19 pandemic. Structural equation modeling was used to explore the effects between constructs. We analyzed structural paths for the entire sample and for the two groups (small and large companies). According to the results concerning both groups, the impact of the availability of key information on emotional burnout is negative only for small companies. Contrary to that the negative impact of intergenerational leadership on emotional burnout is much stronger in large companies. Concerning the impact of physical burnout on emotional burnout, the positive impact of physical burnout exists in both types of companies but is stronger in small companies. The findings will contribute to a clearer picture and the adoption of further measures to prevent burnout in the workplace and increase work engagement concerning the firm size, especially during the COVID-19 pandemic.

Keywords: leadership, burnout, work engagement, older employees, firm size

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INTRODUCTION

Creating an appropriate work environment contributes to employees' wellbeing, health, and work motivation (Bakker et al., 2014). Therefore, companies need to consider demographic change and create jobs to adapt to an aging workforce (Parker, 2014). Companies need to be aware that older employees in good health and wellbeing are more engaged and more motivated to continue working (Ekoh, 2021). Some authors identify three age groups of older employees: the first group is younger aging employees, aged from 45 to 54; the second group is medium aging employees, aged from 55 to 65; and the third group includes older aging employees, aged more than 65 (Tew, 2004). In most cases, the lower age limit defining older employees is 45 years (Brooke, 2003) or 50 years (Ilmarinen, 2001). Ghosheh et al. (2006) argued that the term "older employees" includes workers between 40 and 50 years of age. Older employees who work in organizations that support demographic changes, human resource practices tailored to their needs and values, and support a positive development climate are more engaged in the workplace (Adisa et al., 2021). Older employees who do not have opportunities for growth and development in the workplace, autonomy, and social support are less engaged to continue working (Lichtenthaler and Fischbach, 2016a). Hence, appropriate job design contributes to employees' wellbeing, health, and work engagement (Bakker et al., 2014). Therefore, companies need to constantly design jobs to adapt jobs to an aging workforce (Adisa et al., 2021), which is particularly important during the coronavirus disease 2019 (COVID)-19 pandemic (Ekoh, 2021).

According to Eurobarometer data, in 2019, 92% of respondents in Slovenia were satisfied with their lives, which is more than the EU average (84%). At the time of COVID-19 and restrictive measures, Slovenia's average assessment of life satisfaction was slightly lower than the EU average (Institute of Macroeconomic Analysis and Development, 2020a). The COVID-19 pandemic has brought indescribable changes to our daily routine. Many companies and organizations were temporarily or permanently closed during this time, and employees are shifting to remote and virtual work environments (Ratten, 2021). Many occupations that work from home were not previously envisaged had to adapt to change. Such a situation has a significant and negligible impact on employees' wellbeing, thinking, and health (Pataki-Bittó and Kapusy, 2021).

The increase in mental health problems is typical of all developed countries due to fast-paced lifestyles, high expectations of the individual, unhealthy lifestyles, growing inequalities, disadvantages, and loneliness of the elderly. During the COVID-19 epidemic, the situation worsened. The COVID-19 epidemic directly impacts people's stress and anxiety (Institute of Macroeconomic Analysis and Development, 2020b). Changed lifestyles (social isolation and loneliness, distance learning, work at home), reduced opportunities for a healthy lifestyle, concerns about employment and income, and additional overburdening of the health system can affect people's mental and physical health during the COVID-19 epidemic (Kaptangil, 2021). Restrictive measures to curb COVID-19 have led to unexpected job closures worldwide and thus to changed forms of work, and the cessation of economic activity has threatened many jobs (Lamprinou et al., 2021). The pandemic has accelerated the process and forced many companies to be more agile and decentralized and agile leadership is becoming more important (McCombs and Williams, 2021). The benefit of such praxes is shown in the ability to be calm in the face of pressure, open to innovation, and able to keep teams grounded and on the right track (Attar and Abdul-Kareem, 2020).

During this time, business arrangements are changing in light of the global pandemic of COVID-19. Employee engagement is an attitude that makes all employees commit to their organization's goals and values (Chanana and Sangeeta, 2020). Vogelgesang et al. (2013) and Guérin-Marion et al. (2018) found that appropriate leadership positively impacts work engagement among employees and proper administration reduces burnout among employees. According to Sarangi and Nayak (2016), the availability of key information, trust, and good communication between the company and employees are essential. This unification between the employee and the company is a necessity as both can achieve the best business results. Chandani et al. (2016) reported that work engagement is based on reliability, belief, commitment, communication, and key information between a company and its adherents. The companies can increase work engagement by improving senior leadership's decision-making, responsibility, and transparency. Furthermore, Garg et al. (2017) found that a higher level of employee engagement leads to less absenteeism, emotional burnout symptoms, physical burnout symptoms, better health, and wellbeing. Moreover, a study shows that employees' work engagement has an effect on a company's bottom line and is strongly related to business performance (Saks, 2017). However, there is still rare evidence of how older employees have adapted to the challenges of new working practices during the COVID-19 epidemic and how the agile leadership practices could potentially lower the risk of burnout and increase the work engagement of older employees. In addition, the concepts of leadership (key information), burnout, and engagement have rarely been explored in the elderly population during the COVID-19.

During the epidemic, high-quality reconciliation of work and family responsibilities is a major challenge for employees. Workers who do their paid work as usual during this time are more concerned about their health exposed to stress. However, when performing work at home, which in normal circumstances could help to facilitate the reconciliation of professional and family obligations, workers in these situations may be burdened with challenges such as the absence of network connections or the performance of tasks in a concise time (McCombs and Williams, 2021). Regardless of the way of working, workers in private life face additional burdens due to custody obligations and distance schooling of children. The results of the all-Slovenia COVID-19 research insight were mainly focused on specific demographic groups and show that 40% of parents rated distance learning as stressful. They spent an average of 140 min a day helping their youngest primary school pupil complete school obligations, and 74% estimated that they spent more time helping pupils complete school obligations than before the outbreak of COVID-19. Single parents can be even more challenged, especially when they do not have the possibility of informal childcare (European Institute for Gender Equality, 2020).

Several studies have examined leadership (Cong and Thu, 2021), employees' wellbeing (Gregersen et al., 2016), motivation, creativity, engagement (Bojadziev et al., 2019; Knezović and Drkić, 2021), and stress (Bean, 2018) from the viewpoint of the firm size. But according to our knowledge, the studies have not yet explored how the specific agile leadership practices from the perspective of providing the key information to employees can influence the presence of burnout and work engagement specifically for older employees during the COVID-19 pandemic, also considering the mediation role of the company size. This variable could potentially be important since the employees of smaller companies seldom benefit from strong wellbeing programs targeted at specific groups of employees simply because of a lack of capital or because of their organizational systems (Baron and Markman, 2003).

Structural equation modeling using group comparisons has been proven to help examine the effects between constructs; therefore, this methodology is used in our study. The multidimensional model includes burnout divided into physical and emotional symptoms, availability of key information, intergenerational leadership, and work engagement, whereas the firm size was used as the mediating variable.

LITERATURE REVIEW AND HYPOTHESES

Burnout and Symptoms of Burnout of Employees During the COVID-19 Pandemic

Work is one of the most critical areas in our lives as it provides an individual with existential security, perfects him, provides a social network, and provides self-esteem and self-confidence, but it can be a source of dissatisfaction and negative influences (such as work burnout) (Mustafa, 2015). Burnout causes exhaustion and overwork in the workplace and consists of three components: a tendency to depersonalize others, emotional exhaustion, and weakened perceptions of achievement in the workplace (Maslach et al., 2001). According to Ruotsalainen et al. (2015), emotional exhaustion means feeling a lack of energy and awareness due to unbalanced demands. World Health Organisation (2019) defined job burnout as a syndrome resultant from prolonged workplace stress, with symptoms including exhaustion, reduced work efficiency, increased mental distance from work, and negative feelings or cynicism associated with the workplace (World Health Organisation, 2019). Burnout may cause physical, emotional, and behavioral illnesses for employees. Physical symptoms of burnout are associated with headaches, chronic fatigue, sleeping problems, increased blood pressure, stomach pain, tiredness, exhaustion, increased risk of cardiovascular diseases, and musculoskeletal pains (Rod and Ashill, 2009). Emotional symptoms of burnout are associated with depression, anxiety, sadness, suicidal ideation, and hypersensitivity, whereas behavioral symptoms of burnout are related to lack of concentration, avoidance of activities, insomnia, reduced working capacity, lack of willingness to work, and lack of socializing with coworkers (Mosadeghrad, 2014). On the organizational level, different symptoms of burnout are linked to employee engagement and satisfaction (Schneider et al., 2017), especially during the COVID-19 pandemic (Adisa et al., 2021). Before the COVID-19, in October 2019, the World Economic Forum found out that the sheer pace and depth of transformational change in the workplace was the greatest threat to workforce health and wellbeing and driving rising levels of anxiety and declining levels of engagement (World Economic Forum, 2019). Prescient companies were already concerned about the impacts on an employee's mental health and the potential impact on productivity and work satisfaction. The COVID-19 pandemic acted as an accelerant, making a bad situation worse (Felstead and Reuschke, 2021). Shatte' (2021) found that between December 2019 and June 2020, the risk for burnout had increased by 9% whereas motivation and engagement were decreased by 29%. Heading off these downturns in productivity and wellbeing, a priority prior to the global pandemic, became critical. Physical symptoms of burnout have a positive impact on emotional symptoms of burnout among older employees (Pluta and Rudawska, 2021), which have a negative effect on an employee's wellbeing, quality of worklife, health, productivity, and performance (Lichtenthaler and Fischbach, 2016a; Haar, 2021). Physical burnout symptoms, manifested in lack of energy or chronic fatigue, have a positive effect on emotional burnout symptoms, which could be manifested in depression. This has a negative impact on the work engagement of older employees (Frins et al., 2016). According to Henkens and Leenders (2010), older employees report higher burnout symptoms. They report that an increased workload, heavy physical work, lack of challenge, autonomy, and social support from colleagues and managers are related to burnout complaints. On the contrary, in favorable psychological conditions and suitable job characteristics, work engagement, and efficiency of older employees grow (Lichtenthaler and Fischbach, 2016a). Therefore, the following hypothesis is proposed:

H1: *Older employees' physical burnout symptoms positively impact their emotional burnout symptoms.*

Burnout and Work Engagement of Older Employees

Burnout in the workplace is a factor that should be improved to prevent the loss of quality of work, productivity, morale, and older employees' mental or physical health (Ekoh, 2021). According to Eriksson and Lindström (2006), a sense of coherence is promoting older employee health; therefore, Vogt et al. (2013) stated that there is a negative relationship between burnout and a sense of coherence. Burnout syndrome is currently the most important work-related stress, which causes significant social and economic losses (Ekoh, 2021). Burnout in the workplace negatively affects the health of older employees and their work engagement as it can lead to many diseases such as heart disease, diabetes, headaches, and migraines (Lichtenthaler and Fischbach, 2016b). Older employees burned in the workplace are physically and emotionally exhausted and are less engaged to continue their work (Ekoh, 2021). Emotional exhaustion and a lack of work resources negatively affect employees' energy level and health, which lead to a lower level of work engagement (Schaufeli and Bakker, 2004; Frins et al., 2016). According to this, the following two hypotheses are proposed:

H2: *Older employees' physical burnout symptoms negatively impact their work engagement.*

H3: *Older employees' emotional burnout symptoms negatively impact their work engagement.*

Availability of Key Information and Intergenerational Leadership

The field of information technology is evolving with incredible speed (Santana, 2021). A rapidly changing work environment requires constant innovation and the formation of employees with greater flexibility, efficiency, and faster decision-making (Lamprinou et al., 2021). Traditional leadership is based on strict methodology, oversight, reporting, hierarchy, delegation, and bureaucracy; the agile way is focused on trusting team members and their competencies, working with clients, results, and responding to change (Oruh et al., 2021). Parveen and Adeinat (2019) summarized that the critical task of leaders is to improve the work environment and to be more open to the feedback of their employees. Engaged employees and communication with them are essential for the success of an agile approach. This, in turn, leads to a reduction in employee burnout. According to the studies by Giorgi et al. (2017) and Parveen and Adeinat (2019), leader support reduces work stressors such as role overload, which influences emotional exhaustion. Therefore, the availability of key information reduces burnout's physical and emotional symptoms (Giorgi et al., 2017). Hence, the following two hypotheses are proposed:

H4: Availability of key information negatively impacts older employees' physical burnout symptoms.

H5: Availability of key information negatively impacts older employees' emotional burnout symptoms.

An effective leader enables age-diverse employees to achieve strategic goals. By acknowledging and responding to the needs of each generation, leaders can maximize the potential of age-diverse employees (Lee et al., 2021). Leaders must consider the differences in attitudes, values, and needs between younger and older employees. By considering the differences between age-diverse employees, leaders with individual measures can increase work engagement and work achievements of older employees (Andel et al., 2012). Intergenerational leadership is becoming an increasingly important factor in the success of companies (Ekoh, 2021). It involves understanding the effects of diversity and introducing behaviors, work practices, and policies that respond to the diversity of the organization (Hsu, 2018). Due to the increasing age diversity in organizations, there is a growing possibility of stereotypes that negatively affect the emotions and behavior of employees, making it difficult for employees to work to their potential and affecting their work efficiency (D'Addio et al., 2010). With the right approach to age diversity, leaders can create an organization in which diverse employees will contribute to success and better results in the workplace (Robson and Hansson, 2007). According to the study by Gill et al. (2010), there is a relationship between leadership style and burnout among older employees. Poor leadership and unclear direction are two main reasons for such burnout (Lee et al., 2021). Accordingly, introducing the appropriate leadership praxes to consider older employees should help prevent different kinds of employee burnout. Therefore, the following two hypotheses are proposed:

H6: Intergenerational leadership praxes negatively impact older employees' physical burnout symptoms.

H7: Intergenerational leadership praxes negatively impact older employees' emotional burnout symptoms.

Leaders who provide essential information about work can better communicate key tasks and intentions for employee actions. Through consistency, they can build better understanding, leading to higher engagement of employees (Avolio and Walumbwa, 2006). Receiving transparent information should reduce the discrepancies between the actual and desired work outcomes. When these are in line, Vogelgesang et al. (2013) reported a positive relationship between leader communication transparency and engagement. This relationship is mediated by follower perceptions of leader behavioral integrity, meaning that concepts' availability of information, leadership, and engagement are somehow related.

H8: Availability of key information positively impacts older employees' work engagement.

The leader's stereotypical beliefs or discrimination lead to a lack of opportunities or support for older employees to participate in specific tasks or development activities in the company (Parveen and Adeinat, 2019). Thus, good leadership is a prominent antecedent in companies that facilitate individual and collective efforts to accomplish shared objectives and improve performance through adaptation and innovation (Yukl and Lepsinger, 2006). According to Modesta and Auksë (2016), appropriate leadership reduces employees' burnout and creates favorable conditions for their professional and personal development. Proper leadership inspires their followers to go beyond self-interest by aligning their values with those of the organization and motivates them to go beyond what is expected of them (Bosak et al., 2021), leading to work engagement among employees (Adisa et al., 2021). Work engagement is defined as a positive and energetic connection with work where engaged employees have a high level of energy, are enthusiastic about their work, and strive to improve the company's efficiency (Schaufeli et al., 2002). Engaged employees do their job with passion and contribute to the long-term success and improvement of the company. Engaged employees work harder, are more successful, offer better service, and contribute more to profit margins (Schaufeli et al., 2002; Villavicencio-Ayub et al., 2015). They also experience positive emotions such as happiness, joy, and enthusiasm (Demerouti et al., 2015), are in better health, more motivated, and are more creative (Chang et al., 2013). Therefore, the following hypothesis is proposed:

H9: Intergenerational leadership praxes positively impact older employees' work engagement.

Leadership in Firms of Different Size

New business times require new approaches and ways of leading (Bojadziev et al., 2019). The desire for greater efficiency and competitiveness is the main reason for introducing agile leadership, especially during these challenging times (Attar and Abdul-Kareem, 2020). An agile work environment is characterized by teamwork, a high level of communication, and a low degree of standardization and formalization (Attar and Abdul-Kareem, 2020; McCombs and Williams, 2021). It is almost impossible for companies to grow and expand without effective leadership, as is imperative in an ever-changing market (Bojadziev et al., 2019). While large corporations can survive for a short time without appropriate leadership, the opposite is often true for small businesses (Cong and Thu, 2021). Small companies usually consist of only a few employees and could fail if their leadership structure is compromised (Anning-Dorson, 2021).

Small business owners and employers have the power to impact their employees' mental health in a big way by helping people feel safe, heard, and valued (Cong and Thu, 2021). Accurately providing information about work and changes in a small business leads to the better mental wellbeing of older employees (Bojadziev et al., 2019). Prioritizing mental health keeps employees engaged and increases productivity. Gregersen et al. (2016) found that leaders play a key role in improving the wellbeing of their employees by reducing emotional exhaustion. Communication and leadership become exponentially more important as a company gets larger (Knezović and Drkić, 2021). According to Bojadziev et al. (2019), the democratic style is typical for SMEs. It focuses on group relationships and the sensibility of employees in the company. This leadership style promotes professional competence and the team members take responsibility for their behaviors. The leaders are patient, confident, and friendly (Bojadziev et al., 2019). They guide the members within the group, in which they are part and allow the exchange of ideas from other group members. Such leaders encourage the team members to get involved in the decision-making process (Khan et al., 2015). This results in greater employee satisfaction, motivation, innovation, creativity, and engagement (Bojadziev et al., 2019; Knezović and Drkić, 2021). Also, Bean (2018) found out that employees in smaller companies are less stressed than employees in larger companies. Employees in larger companies reveal that they experience moderate to high levels of work-related stress several times per week. Therefore, the following hypothesis is proposed:

H10: Firm size moderates the relationships proposed in hypotheses from H1 to H9.

According to the above hypothesis, the conceptual model presented in **Figure 1** was proposed. Moderating impacts of the firm size are marked with the dotted arrows.

MATERIALS AND METHODS

Sample Type and Data Collection

In this study, a combination of judgmental and quota samples was used. In the first phase, the researchers selected several companies from the representative industries. In the second phase, the quotas were set for employees regarding their age (employees aged from 50 to 55 years, employees aged from 56 to 61 years, and employees aged over 62 years), industry (manufacturing; trade, maintenance, and repair of motor vehicles; financial and insurance activities; professional, scientific and technical activities; information and communication activities; health and social care; real estate business; and catering and other diversified business activities), and company size (small, medium-sized, and large companies). The online questionnaire was addressed to the company's owner/manager, and the request for data collection was sent *via* e-mail. The owner/manager of the company was asked to distribute a questionnaire among older employees. The response rate of companies prepared to participate in the study was 83%.

Sample Characteristics

In the survey during the COVID-19 pandemic, 583 older employees participated. The survey included 40.0% of employees aged from 50 to 55 years, 43.0% of employees aged from 56 to 61 years, and 17.0% of employees aged over 62 years. Regarding gender, 53.9% of women and 46.1% of men were involved. The largest share of companies in which older employees are employed was in the large companies (59.2%). Small and medium-sized companies (SMEs) employed 40.8% of employees in our sample. The companies in which older employees are employed were from manufacturing (25.9%); trade, maintenance, and repair of motor vehicles (17.8%); financial and insurance activities (16.6%); professional, scientific, and technical activities (14.1%); information and communication activities (10.2%); health and social care (5.6%); real estate business (4.1%); other diversified business activities (2.3%); catering (2.1%); and other activities (1.3%).

Measurement Instrument

For measuring the proposed concepts, the Likert-type scale from 1 (strongly disagree) to 5 (strongly agree) was used. Items for the work engagement were adopted from Robinson et al. (2004) and Gallup (2006). Items for the physical and emotional burnout symptoms were adopted from Mosadeghrad (2014). Items for intergenerational leadership were adopted from Naegele and Walker (2006) and Agrawal (2012). Items for the availability of key information were self-generated and partially adapted from Barrett (2006).

Reliability and Validity of the Scales

Confirmatory factor analysis (CFA) was performed to test the reliability and validity of the scales. Results of the measurement model are presented in **Table 1**. All standardized indicator loadings ranged from 0.69 to 0.97 and exceeded the suggested threshold of 0.6. Composite reliabilities ranged from 0.94 to 0.96 and are inside the suggested intervals, indicating the adequate reliability of the scales. Average variance extracted (AVE) values varied between 0.71 and 0.93, also showing convergent validity of the scales. Next, the HTMT matrix (Henseler et al., 2015) was used to test the discriminant validity of the scales, and all ratios of correlation between latent variables, except the one between leadership and engagement, are lower than the suggested threshold of 0.85 (**Table 2**). An additional Fornell and Larcker (1981) test shows that all AVE's square root calculations were higher than correlations between the constructs.

RESULTS

Two models were tested in this study. First, a general structural model including the whole sample was proposed, not differentiating between the groups according to the firm size. Then, the participants were divided into two groups, and group analysis was performed.

The structural equation modeling was performed with the maximum likelihood (ML) estimation using the AMOS 27 software. An overall fit assessment resulted in a significant

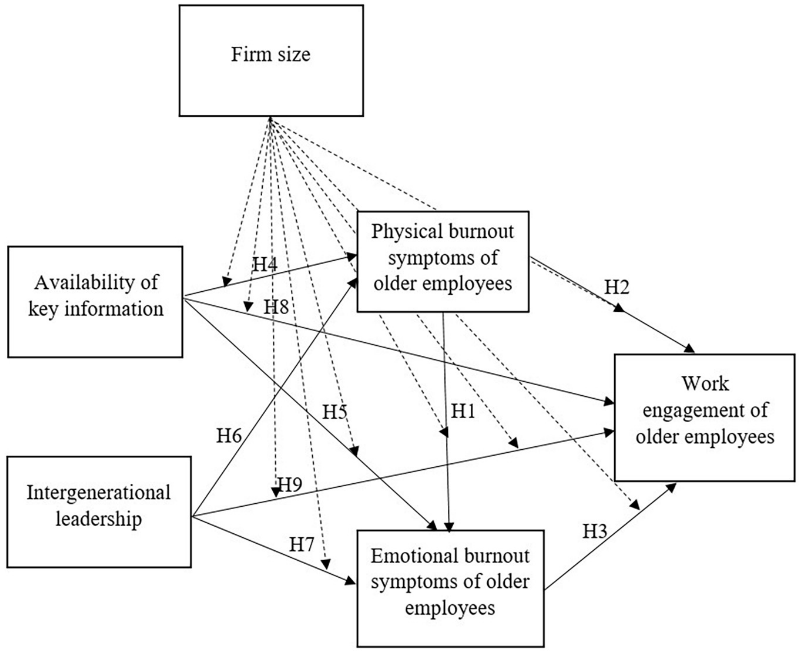

FIGURE 1 | Conceptual model and hypotheses.

chi-square value [$\chi^2(200) = 73{,}137$; $p < 0.001$], which indicates a non-perfect fit. According to Bollen (1989), χ^2 may be an inappropriate standard when dealing with the complex model and the large sample size, as in our study. Therefore, other fit indices should be used. Accordingly, the following indices were calculated for the general model: root mean square error of approximation (RMSEA) = 0.068, comparative fit index (CFI) = 0.968, tucker lewis index (TLI) = 0.963, and incremental fit index (IFI) = 0.968. All indices were within the accepted boundaries of RMSEA < 0.08, CFI > 0.90, TLI > 0.90, and IFI > 0.90 as proposed by representative authors in the field (MacCallum, 1986; Byrne, 1994; Hu and Bentler, 1999).

The structural model results are presented in **Table 3** under "All." Physical burnout positively influenced emotional burnout ($\beta_1 = 0.468$; $p < 0.001$). Therefore, H1 was supported. Only emotional burnout had a statistically significant negative impact on employee engagement ($\beta_2 = -0.223$; $p < 0.001$). In contrast, the path from physical burnout to engagement was not significant and therefore abandoned in the final model; hence H3 was supported, and H2 was rejected. Both paths leading to physical burnout from the availability of key information ($\beta_3 = -0.280$) and intergenerational leadership ($\beta_4 = -0.413$) were negative and statistically significant at $p < 0.001$, implying that hypotheses H4 and H6 can be supported. In addition, there was a negative and statistically significant impact of the availability of key information ($\beta_5 = -0.111$, $p < 0.05$) and intergenerational leadership ($\beta_6 = -0.381$; $p < 0.001$) on emotional burnout, therefore also H5 and H7 were supported. Both intergenerational leadership ($\beta_7 = 0.579$) and the availability of key information ($\beta_8 = 0.166$) directly positively influence employee engagement at $p < 0.001$. Hence, H8 and H9 were supported.

Next in line was the testing for the differences between the groups according to the firm size. Following the recommended practices in the literature (e.g., Steenkamp and Baumgartner, 1998; Vanderberg and Lance, 2000), we tested the measurement invariance across the two groups of large and small companies. This was first used in the measurement and then in the structural model. First, a test of configural invariance or a test of weak factorial invariance was deployed (Horn and McArdle, 1992), where factor loadings were allowed to be free for each of the two groups. All fit indices suggested a good fit of the configural invariance model (**Table 4**). To test the path differences or path invariance, at least metric equivalence had to be established (Vanderberg and Lance, 2000). Therefore, in the second step, metric invariance or a test of strong factorial invariance was performed to establish whether these factor loadings were invariant across groups.

The full metric invariance was assessed by constraining all factor loadings across the three groups to be equal. The results in **Table 3** indicate that the difference in $\Delta\chi^2$/df for configural invariance model and full metric invariance model was not statistically significant at $p < 0.05$, implying that full metric equivalence was achieved. Since at least partial metric invariance must be established for subsequent tests to be meaningful (Steenkamp and Baumgartner, 1998; Vanderberg and Lance, 2000), one factor loading constraint was removed. The path from burnout to "I feel panic" was not invariant across the small and large groups. As can be observed from the invariance table, the partial metric invariance model exhibits an even better fit to the data than the full metric invariance model. The difference in $\Delta\chi^2$/df between configural invariance and partial metric invariance models is non-significant.

TABLE 1 | Indicators means, standard deviations, loadings, and latent variables composite reliabilities and average variances extracted.

Latent and manifest variables	Mean	Std. dev	Lambda	CR	AVE
Physical burnout					
My blood pressure varies	2.36	0.994	0.917	0.952	0.869
I'm sweating	2.24	0.996	0.929		
I have vertigo	2.22	0.963	0.950		
Emotional burnout					
I am sad	2.24	1.042	0.890	0.944	0.707
I am afraid of losing the job or not finishing the work on schedule	2.54	1.018	0.793		
I feel panic	2.17	0.957	0.891		
I am tense	3.22	1.040	0.695		
I have depressive feelings	2.25	1.047	0.874		
I am emotionally exhausted	2.51	1.133	0.879		
I am quarrelsome	2.24	0.995	0.844		
Engagement					
I believe in the successful development and operation of our company	4.07	0.879	0.926	0.958	0.819
I am proud to be employed in this company	3.81	1.037	0.934		
I trust in my colleagues and the manager	4.04	0.914	0.907		
I am aware of the importance of innovation for our company and I am helping to develop the company	4.03	0.923	0.913		
I do my work with passion	3.57	1.033	0.841		
Intergenerational leadership					
The leader in our company fosters good relationships between employees	3.60	0.999	0.946	0.970	0.865
The leader in our company fosters good relationships between employees and superiors	3.72	1.000	0.935		
The leader emphasizes and encourages employee motivation in the workplace	3.44	1.029	0.934		
The leader in the company cares that older employees do not feel the negative impact of stereotypes about older employees	3.45	1.029	0.921		
The leader ensures the work satisfaction and wellbeing of employees	3.51	1.078	0.915		
The availability of key information					
I have all necessary information to perform my work	4.01	0.889	0.972	0.962	0.926
I have everything I need to carry out my work tasks	4.03	0.866	0.953		

Fit indices for the measurement model: $\chi^2(199) = 731.00; p < 0.001; RMSEA = 0.068; NFI = 0.956; IFI = 0.968; TLI = 0.962; CFI = 0.968.$

TABLE 2 | HTMT ratio of correlations.

	1	2	3	4
1. Physical burnout				
2. Emotional burnout	0.773			
3. Engagement	0.663	0.804		
4. Intergenerational leadership	0.647	0.786	0.901	
5. The availability of key information	0.624	0.721	0.818	0.841

The same tests were also applied to the structural models. As for the model of unconstrained paths between groups, the model fits the data well. When all paths were constrained to be equal across the groups, the $\Delta\chi^2$/df between both models was statistically significant, implying that the constraint path model was not as good as the unconstrained model. In a search for a more valid model with partially constrained paths, the following paths were unconstrained: (a) the path from information to emotional burnout, (b) the path from intergenerational leadership to emotional burnout, and (c) the path from physical burnout to emotional burnout. The final model with partially constrained paths exhibits a better fit than the alternative constrained path model and the same fit as the unconstrained model, with the following fit indices: $\chi^2(420) = 1{,}050.298$ ($p < 0.001$), RMSEA = 0.051, CFI = 0.962, TLI = 0.958, and IFI = 0.962.

Bold values in **Table 3** indicate the relationships where the differences between both groups exist. According to the results concerning both groups, the impact of the availability of key information on emotional burnout is negative only for small companies, since this path is statistically insignificant for large companies. In contrast, the negative impact of intergenerational leadership on emotional burnout is much stronger in large companies. Concerning the impact of physical burnout on emotional burnout, the positive impact of physical burnout exists in both types of companies but is stronger in small companies. Since only these three relationships were different across the groups, H10 could only be partially supported.

DISCUSSION

Theoretical Implications

The COVID-19 pandemic has dramatically increased stress and burnout among older employees (Shipman et al., 2021). Stress and burnout involve both physiological and psychological

TABLE 3 | Structural paths for the entire sample and the two groups (small and large companies).

	All	Sig.	Small	Sig.	Large	Sig.	Hypothesis testing
H1: Physical burnout - > Emotional burnout	**0.468**	$p < 0.001$	**0.633**	$\boldsymbol{p < 0.001}$	**0.370**	$\boldsymbol{p < 0.001}$	Supported
H2: Physical burnout - > Engagement			Non-significant in the initial model				Not supported
H3: Emotional burnout - > Engagement	**−0.223**	$p < 0.001$	−0.228	$p < 0.001$	−0.216	$p < 0.001$	Supported
H4: The availability of key information - > Physical burnout	**−0.280**	$p < 0.001$	−0.405	$p < 0.001$	−0.197	$p < 0.05$	Supported
H5: The availability of key information - > Emotional burnout	**−0.111**	$p < 0.05$	**−0.152**	$\boldsymbol{p < 0.05}$	**−0.032**	**n.s.**	Supported
H6: Intergenerational leadership - > Physical burnout	**−0.413**	$p < 0.001$	−0.329	$p < 0.001$	−0.468	$p < 0.001$	Supported
H7: Intergenerational leadership - > Emotional burnout	**−0.381**	$p < 0.001$	**−0.184**	$\boldsymbol{p < 0.01}$	**−0.553**	$\boldsymbol{p < 0.001}$	Supported
H8: The availability of key information - > Engagement	**0.166**	$p < 0.001$	0.181	$p < 0.01$	0.161	$p < 0.01$	Supported
H9: Intergenerational leadership - > Engagement	**0.579**	$p < 0.001$	0.572	$p < 0.001$	0.582	$p < 0.001$	Supported
H10: Moderating impacts			Moderating impacts for relationships proposed in H1, H5, H7				Partially supported

TABLE 4 | Invariance test results.

Model	χ^2	df	$\Delta\chi^2$/df sig.	NFI	IFI	TLI	CFI	RMSEA
Measurement model								
Configural invariance	1027.96	398		0.940	0.962	0.956	0.962	0.052
Full metric invariance	1047.88	414	0.224	0.938	0.962	0.957	0.962	0.051
Partial metric invariance	1043.97	413	0.381	0.939	0.962	0.957	0.962	0.051
Structural model								
Unconstrained paths	1045.508	415		0.939	0.962	0.958	0.962	0.052
Constrained paths	1073.532	423	0.000	0.937	0.961	0.957	0.961	0.051
Partially constrained paths	1050.298	420	0.442	0.938	0.962	0.958	0.962	0.051

responses to environmental stressors. This affects the functioning of the autonomic nervous system, which is the primary response system for regulating the body's physiological reaction to stress (Haar, 2021).

Based on the research, we found that older employees' physical burnout symptoms positively impact their emotional burnout symptoms, which means that increasing physical burnout symptoms increases emotional burnout symptoms. Moreover, we found that the positive impact of physical burnout symptoms on emotional burnout symptoms of older employees exists in both types of companies but is stronger in small companies, which is in line with Lichtenthaler and Fischbach (2016a,b), Ekoh (2021), and Lee (2021). In addition, Wallo and Kock (2018) emphasized that employees in SME companies may even be more stressed than those who work in other environments. Stress arises in SME company settings from primary sources, namely, overload, uncertainty, understaffing, role conflict, lack of a clear job description, lack of sufficient experience, and personal problems. According to Christian et al. (2011), symptoms of burnout lead to less work engagement among employees. Thus, we found that older employees' physical burnout symptoms and older employees' emotional burnout symptoms negatively impact their work engagement. Work engagement is related to the decision and optimal functioning of the wellbeing perceived in the workplace (Christian et al., 2011); therefore, higher levels of stress or burnout of older employees reduce work engagement (Junça Silva and Lopes, 2021).

The availability of key information has a negative impact on older employees' burnout symptoms, which is evident in large and small companies. Still, especially emotional burnout could be higher in SME companies if key information is not forwarded to older employees. Additionally, agile leadership praxes seems to be more critical for larger companies to prevent burnout due to organizational and occupational hazards of older employees. This could be attributed to the rigidity of large organizations that sometimes forget about the different needs of employees belonging to different generations.

Another implication from our study is that intergenerational leadership praxes negatively impact older employees' physical burnout symptoms. Intergenerational leadership praxes negatively impact older employees' emotional burnout symptoms, but this impact is much stronger in large companies. This is in line with Haar's (2021) claim that employees working in larger-sized firms will report higher levels of burnout risk and that the firm size could be a determinant of burnout rates, reflecting that larger-sized firms operate in more competitive environments, which can create additional pressure on employees.

Managerial Implications

Therefore, we recommend that companies, especially SMEs, focus on open communication with all employees, which helps to inform better, transfer company goals to employees, improve motivation at work, increase a sense of belonging to the company, encourage employees to express opinions and ideas, and obtain feedback on employees' wellbeing and management efficiency. In addition, we recommend that companies organize regular meetings (in the case of larger companies, at the level of working groups) where employees are acquainted with work performance, the performance appraisal, the reward system, and plans for the future. At the evaluation meetings, employees can present their opinions, problems, and suggestions for improving the wellbeing and organization of work in the team. We also recommend rotation of employees within the work process, which helps to reduce monotonous and repetitive work that can lead to alienation from work. In this way, employees supplement their knowledge and skills and maintain a higher level of work engagement.

Due to globalization and competitiveness, almost every company changes its infrastructure (Junça Silva and Lopes, 2021). When the authority of any company attempts to change the partial or complete structure, the employees suffer from stress or burnout (Kim et al., 2017). In addition, unclear instructions and expectations, poor listening skills, unreliable data, and lack of collaboration among employees lead to physical and emotional burnout symptoms in older employees and a lower level of work engagement for older employees (Lichtenthaler and Fischbach, 2016a). From this point of view, the availability of information in the company is very important because employees have all the necessary information to perform their work and are constantly informed about changes in the company, which allows them to more easily adapt to changes in the company, especially in SMEs (Bojadziev et al., 2019; Anning-Dorson, 2021). This increases work engagement among older employees (Haley et al., 2013). Additionally, we found that the availability of key information positively impacts older employees' work engagement. Good information is essential for effective operation and decision-making at all levels of business. Therefore, we recommend that companies of all sizes organize training workshops for leaders where they acquire special knowledge in human resource management such as communication skills, prevention and resolution of interpersonal conflicts, organization of work and distribution of responsibilities, expressing formal and informal praises, and criticisms. In addition, companies should organize work in small groups, which enables the better organization of work, greater transparency in the division of work tasks and responsibilities, and a greater sense of the individual's information, efficiency, independence, and control over their work. Companies also should use modern communication channels and tools. Using various intelligence systems, managers can communicate quickly and easily with employees. Digitization and reorganization of departments can provide employees with a simplified way of communication, access to documents, information, and superiors.

We discovered that in large companies, employers take care of appropriate leadership because this reduces the emotional symptoms of burnout among older employees (Guérin-Marion et al., 2018; Scheuer and Loughlin, 2021). Ignoring the needs of any age group of employees will likely result in lower productivity and work engagement. According to our study, intergenerational leadership praxes positively impact older employees' work engagement. As intergenerational workforces dominate today's labor market, it is more important than ever for leaders to pay special attention to the needs and desires of the different generations in their company to increase employee engagement and business performance (Guérin-Marion et al., 2018). A commitment to understanding the needs of individual employees remains a sound approach to leadership that creates a productive and positive work environment (Hoch, 2014; Guérin-Marion et al., 2018). Diversity is essential for growth in companies, creativity, and innovation because it may be tough to obtain innovative ideas from homogeneous teams who have the same mindset and similar ways of working (Yadav and Lenka, 2020). Demographic change and active aging in the workplace contribute to the creation of new leadership, strategies, and business processes throughout the management of age-diverse employees, especially during the COVID-19 pandemic.

Limitations and Further Research

This study was only limited to five constructs: physical burnout symptoms, emotional burnout symptoms, work engagement, the availability of key information, and intergenerational leadership. In addition, our research is limited to the time during the COVID-19 pandemic and had a cross-sectional design. The possible pre- and post-COVID-19 analysis would give even more insight into the research constructs and their relationships. Additionally, we would recommend analyzing the differences between older and younger employees. In addition, non-random sampling can present a limitation of our research as well as same-source bias and common method bias. Although some procedural strategies to minimize such biases were deployed, the cause could still be because the respondents evaluated the independent and dependent constructs simultaneously and since the data sources for predictor and criterion variables were the same.

Our research is the first survey in Slovenia that examines physical burnout symptoms, emotional burnout symptoms, work engagement, the availability of key information, and intergenerational leadership among older employees during the COVID-19 pandemic. In addition, our findings highlight the importance of intergenerational leadership and the availability of key information, particularly as teams tend to grow more diverse in current work settings. More and more employees are exposed to various symptoms of burnout, so our research highlights the multiple suggestions about reducing burnout, improving leadership, and increasing work engagement among older employees. The study highlights the importance of agile leadership, diversity in the workplace, work engagement, and information that is increasingly important in today's business and should be considered. The practical relevance of the study motivates the leaders and academics to promote diversity management practices and increase work engagement in all sizes of companies, especially during the COVID-19 pandemic.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

AUTHOR CONTRIBUTIONS

BM and MR contributed to conception and design of the study, organized the database, and wrote the first draft of the manuscript and sections of the manuscript. BM performed the statistical analysis. Both authors contributed to manuscript revision, read, and approved the submitted version.

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Relationship Between Paternalistic Leadership and Employee Innovation: A Meta-Analysis Among Chinese Samples

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The meta-analysis was conducted to examine the relationships between three dimensions of paternalistic leadership and employee innovation in Chinese enterprises. There exists over a decade of empirical research on the influence of paternalistic leadership on employee innovation in China, but the findings from the various studies are not consistent. Sixty-nine studies from 2009 to 2021 were included in the meta-analysis, and 154 effect sizes were examined. The study found that two dimensions of paternalistic leadership (benevolent leadership $r = 0.396$ and moral leadership $r = 0.329$) were positively associated with employee innovation. In contrast, the dimension of authoritarian leadership was negatively associated with innovation ($r = -0.151$). Moderator analyses found that gender, the education level of employees, time, and the type of evaluation served as meaningful moderators. The moderating effects of outcome measure, the type of data collection method, and the type of publication were not significant. We discuss our limitations, implications for future studies, and practical implications for organizational management.

Keywords: paternalistic leadership, meta-analysis, innovation, Chinese sample, moderation effect

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INTRODUCTION

Paternalistic leadership, a widespread and deep-rooted leadership style in oriental organizations, is one of the most widely cited factors of influence on employees' behaviors in the Chinese context. Amidst the increasing interest of enterprises and researchers in innovation, whether paternalistic leadership promotes or impedes employees' innovation in China has raised broad concern (Wang and Cheng, 2010; Cheng, 2020; Nazir et al., 2021). The body of research on the subject is extensive, but discrepancies in the findings mark the literature. Authors such as Jin et al. (2016), Wang Y. W. et al. (2021), and Xia et al. (2021) concluded that one of the dimensions of paternalism (authoritarian leadership, AL) was positively associated with employee innovation, while other researchers (e.g., Du and Wang, 2020; Liang, 2020; Li and Wang, 2021) found a negative correlation between them. Wu (2018) and Cheng (2020) found strong positive relationships between the two other dimensions of paternalism (benevolent leadership, BL and moral leadership, ML) and employee innovation. However, the results of other studies (Feng, 2009; Li et al., 2014; Chen and Hou, 2016; Wang, 2019) found that benevolent and moral leadership were weakly or even negatively correlated with innovation.

Empirical studies may reach different conclusions due to sampling or other factors (Hunter and Schmidt, 2004). Meta-analysis can correct statistical errors based on large samples and reach a more general conclusion. Therefore, it is necessary to conduct a meta-analysis of the relationship between paternalistic leadership and Chinese employee innovation. A meta-analysis already involves the relationship between paternalistic leadership and employees' innovation (Hiller et al., 2019). However, (1) it mixed Chinese samples with the samples from other countries and did not report the results based on Chinese samples; (2) the inclusion of Chinese samples was not comprehensive enough (i.e., the included Chinese samples were only retrieved from Chinese Social Science Citation Index, while many studies from other databases were neglected); (3) it only involved innovation as one of the indicators of employee performance, and there was no specific and detailed investigation into the relationship between paternalistic leadership and employees' innovation.

Based on the reasons mentioned above, to clarify the relationship between paternalistic leadership and employee innovation in the Chinese context, a meta-analysis exclusively focusing on Chinese employees' innovation (not overall performance) is needed. Drawing upon the insights from the employee creativity formation mechanism model (Wang et al., 2010) and self-determination theory (Deci and Ryan, 1985), we examine the associations of the three aspects of paternalistic (BL, ML, and AL) with Chinese employees' innovation. And we explore the potential moderators in the associations, including methodological moderators (e.g., type of innovation evaluation), demographical moderators (e.g., employee gender and education level), and a macro moderator (i.e., era background). Our findings provide evidence from China on how paternalistic leaders promote or impede employee innovation. Our limitations, theoretical implications, and practical implications are discussed.

LITERATURE REVIEW AND HYPOTHESES

Paternalistic Leadership

To a large extent, paternalistic leadership reflects Chinese Confucian culture and family values. In traditional Confucian culture, the patrilineal family is the primary institutional unit of society. According to Confucianism's notion of the five relationships that form the basis of society, the father–son relationship is second only to the monarch–subject relationship. The father is considered the family's core and has absolute authority. The Chinese generalize the experience learned from the family to other organizations. A paternalistic leader of an organization tends to play a role similar to a father in the patrilineal family, and the subordinates play the role of "offspring." The leader must have the majesty of a father, while the subordinates must have "son-like" loyalty and obedience (Farh and Cheng, 2000). In addition, Confucian culture places great emphasis on personal morality. And people often place higher moral expectations on those with higher social status. In the Confucian context, leaders must have a high moral quality. Otherwise, they will not be genuinely venerated by their subordinates. Finally, paternalism also emphasizes the responsibility of the father to protect and care for the family members, which transformed into the benevolence of the superior to the inferior in enterprises and other organizations (Zhou and Long, 2005).

Paternalistic Leadership is a notion similar to a traditional Chinese "fatherly Leadership." Paternalistic leaders not only show the image of a "strict father" who maintains strict discipline and rules but also show kindness and care to subordinates. At the same time, they also set a good moral example for subordinates (Farh and Cheng, 2000; Zhu et al., 2022). Paternalistic Leadership consists of three sub-leadership styles, benevolent leadership (BL), moral leadership (ML), and authoritarian leadership (AL). BL refers to the behaviors that involve long-term concerns and support for the followers' work, life, and welfare (Ren et al., 2021). ML involves the leader's virtue, self-discipline, and selflessness. AL emphasizes the leader's absolute authority and control over subordinates and requires subordinates to accept the assignment and obey the leader unconditionally (Farh and Cheng, 2000; Aycan, 2006; Pizzolitto et al., 2022). The three substyles may lead to different reactions and outcomes of subordinates. Benevolent leaders may be responded with the followers' gratitude and reciprocation, and ML may increase the followers' respect for and identification with the leader. However, on the other hand, AL can lead to subordinates' obedience to, dependency on, and fear of the leader (Cheng et al., 2004; Farh et al., 2006; Niu et al., 2009; Chen et al., 2014).

Employee Innovation

Scott and Bruce (1994) defined innovation as the process by which individuals or teams generate new ideas and put them into practice to improve performance. Specifically, individual innovation is divided into three stages: (1) discovering problems and generating new ideas to solve problems, (2) examining the ideas and seeking support, and (3) putting the ideas into practice (Janssen, 2000).

At present, the measurement tools for employee innovation mainly include innovative behavior scales and creativity scales developed by Scott and Bruce (1994), Zhou and George (2001), Janssen (2000), and Criscuolo et al. (2014). To understand innovation among Chinese employees, researchers localized the adaptations of these scales (Lu and Zhang, 2007). They also conceptualize innovation as a process including idea generation, promotion, and execution. Based on the conceptualization and measurement of Chinese employee innovation (Kim et al., 2018; Lee et al., 2020a,b; Watts et al., 2020; Lin et al., 2022), this study takes both innovative behavior and creativity as the indicators of employee innovation. To ensure the rigor of our research, we examine whether the associations of the three aspects of paternalistic leadership with innovation vary over different measurement tools in moderator analyses.

Relationship Between Paternalistic Leadership and Innovation

According to the employee creativity formation mechanism model (Wang et al., 2010), employees' intrinsic motivation at work plays a crucial role in the relationship between leadership and innovation. Scott and Bruce (1994) first suggested that intrinsic motivation is the core of innovation. Shin and Zhou (2003), Shalley et al. (2009), Wang et al. (2010), and Siyal et al. (2021) suggested that leadership affects employee innovation by influencing employees' intrinsic motivation.

Self-determination theory (SDT) believes that people generally have three basic psychological needs: autonomy, competence, and relatedness, which lie at the heart of individual intrinsic motivation. Autonomy refers to an individual's voluntary choice to engage in certain activities according to their inner will and desire. People with a satisfied need for autonomy tend to engage in behaviors with intrinsic interest and motivation. The need for competence refers to an individual to experience that they are capable of performing an activity. Relatedness is the individual's need to obtain the care and understanding of others in the external social environment to experience a sense of belonging to the group (Deci and Ryan, 1985, 2000). Benevolent leaders focus on mobilizing resources to support subordinates to complete tasks and achieve career development and care for subordinates' wellbeing (Wang and Cheng, 2010). Care from a benevolent leader can satisfy the relatedness needs of subordinates, enhance employees' intrinsic motivation at work, and promote their initiative at work, which may, as a result, promote employees' innovation. For example, employees with a higher intrinsic motivation at work are more likely to go the extra mile to solve problems creatively.

An enduring emphasis in innovation research has been on the influence of positive or negative leader behaviors, such as supportive (Madjar et al., 2002) or abusive (Aryee et al., 2007) leader behaviors. Leaders who create a supportive environment not only allow their subordinates to have the freedom to experiment with innovation (Amabile, 1988; Siyal et al., 2021) but also provide positive and constructive feedback at work and encourage employees to find and solve problems by themselves, which is conducive to improving employees' intrinsic motivation and promoting employees' innovation (George and Zhou, 2007; Su et al., 2022). Authoritarian leaders, on the other hand, closely monitor employees and require them to follow the rules and orders strictly. They do not allow employees to participate in decision-making. As a result, the lack of autonomy under AL will reduce employees' intrinsic motivation (George and Zhou, 2001; Zhou and George, 2003; Gu et al., 2020) and impede their creative thinking. In addition, authoritarian leaders rarely encourage or support followers to develop or realize their ideas, restricting employees' innovative behavior.

According to the analysis above, we propose Hypothesis 1 and 2:

H1: Benevolent leadership is positively associated with Chinese employees' innovation.

H2: Authoritarian leadership is negatively related to Chinese employees' innovation.

ML displays qualities such as honesty, integrity, equity, and selflessness, which can win the trust of subordinates (Brown and Treviño, 2006; Niu et al., 2009), and enhance subordinates' psychological safety. Because innovation usually takes risks, subordinates under a trusted leader will be more willing to propose and apply their ideas and challenge the status quo without the fear of unfair punishment. A high level of psychological safety will improve employees' "psychological freedom," fostering their innovative activities (Walumbwa and Schaubroeck, 2009). Therefore, moral leadership may promote employee innovation by improving subordinates' trust in the leader and psychological safety. We propose Hypothesis 3:

H3: Moral leadership is positively associated with Chinese employees' innovation.

Moderators of the Relationship Between Paternalistic Leadership and Employee Innovation

Gender

According to role congruity theory, female and male employees have different preferences for leadership (Eagly and Karau, 2002). Compared with male workers, females are more inclined to work under more humanistic and relationship-oriented supervision (Boatwright and Forrest, 2000). Benevolent leadership and moral leadership emphasize leaders' concern for the followers and moral example, which might have a greater positive impact on female workers' motivation and initiative by creating a caring atmosphere and fulfilling female workers' needs, and then further promoting females' performance, including innovation. In addition, females' relationship orientation might make it easier for females to settle when they are under authoritarian leadership and reduces the negative impact of authority on females' innovation. Gender role, on the other hand, demands males to be more competitive and more power-oriented (Eagly et al., 2000). This might lead to more dissatisfaction, conflicts, or even counter-productive behaviors among the male subordinates under authoritarian leadership because they are less willing to obey the authoritarian leader (Brandt and Henry, 2012; Liu et al., 2021), which might even further enhance the negative impact of authoritarian leadership on male workers' innovation. Thus, the percentage of female employees in the samples can probably enhance the positive effects of BL and ML on innovation and reduce the negative impact of AL on innovation. We develop Hypothesis 4:

H4: The percentage of female respondents can positively moderate the relationships between the three aspects of paternalistic leadership and innovation.

Education Level

It has been revealed that employees with higher education levels relatively value autonomy, respect, and emotional incentive more at work (Oldham and Cummings, 1996; Shalley et al., 2004). For employees with higher education levels, the role of leaders is no longer to give specific guidance to their work but to help them set goals and provide support (Shalley and Gilson, 2004). Benevolent leaders support and care for the work and life of subordinates, which can meet the emotional needs of educated workers. As a result, subordinates with higher education levels might engage in their work with a higher level of intrinsic motivation and initiative, which are exactly what innovation demands. We also expect that education level has a similar effect on the relationship between moral leadership and innovation.

On the contrary, authoritarian leadership that emphasizes strict control over subordinates and requires unconditional obedience might have a worse impact on educated workers' inner motivation than less-educated workers. Thus, we develop Hypotheses 5 and 6:

H5: The percentage of employees with higher education levels (college diploma or above) positively moderates the associations of benevolent leadership and moral leadership with employee innovation.

H6: The percentage of employees with higher education levels (college diploma or above) negatively moderates the relationship between authoritarian leadership and employee innovation.

Outcome Measure

Original studies included in this meta-analysis adopted different questionnaires or scales to assess employee innovation. Although some innovation scales focus more on innovative behavior and other scales are inclined to measure creativity, the difference among these innovation scales is tiny conceptually because behaviors are also used as the primary indicator in creativity assessment. That said, the different outcome measurement tools may still affect the robustness of our research results. Therefore, the outcome measure is examined as a potential moderator. Instead of putting forward a certain hypothesis, we examine an exploratory research question assessing if there is considerable variation in the effect sizes caused by the different innovation scales.

Type of Evaluation and Data Collection

To examine whether common method bias affected previous studies' results, we test the moderating effect of the evaluation method of innovation: supervisor-evaluation (leaders' rating of each subordinate's innovation) vs. self-evaluation (employees' self-reported innovation). And we also examine the difference between different data collection methods (cross-sectional and longitudinal). When the prediction variables and the outcome variables come from the same evaluator or the data is captured at the same time point, it often leads to common method bias and more significant coefficients (Podsakoff et al., 2003). Previous meta-analyses in other research areas have revealed this phenomenon (Lee et al., 2020a,b). We develop Hypothesis 7 and 8:

H7: Supervisor-evaluation yields weaker associations between three aspects of paternalistic leadership and Chinese employees' innovation than self-evaluation.

H8: Longitudinal data yields weaker associations between three aspects of paternalistic leadership and Chinese employees' innovation than cross-sectional data.

Time

Era background may moderate the relationship between paternalistic leadership and employee innovation in China. As China has been opening up to the outside world for a few decades (since 1979) and the economy has been developing rapidly, people's attitudes and values are also gradually changing, which may weaken the cultural soil of traditional ideas, including paternalism.

Since 2010, China's total GDP surpassed Japan's to become the world's second-largest economy. According to the theory of value change (Inkeles, 1969; Inglehart, 1997), people tend to emphasize freedom and self-expression in an advanced industrial society. The popularity of authoritarianism, which emphasizes absolute obedience, might be wearing off in Chinese society and organizations (Zheng et al., 2020). Therefore, authoritarian leadership might have a greater negative effect on employees' intrinsic motivation since it is getting less accepted by current employees and impedes employee innovation. Meanwhile, the effects of BL and ML on employee innovation might also be influenced by era background but in the opposite direction. We propose Hypothesis 9 and 10:

H9: The year of publication positively moderates the relationship between benevolent leadership and moral leadership and Chinese employees' innovation.

H10: The year of publication negatively moderates the relationship between authoritarian leadership and Chinese employees' innovation.

Type of Publication

Generally, studies with significant results are easier to get published, making a meta-analysis overestimate the real effect size between variables (Sterne et al., 2000). To avoid this bias, this meta-analysis includes not only journal articles but also theses, dissertations, and conference papers, assessing the difference in the results between published journal articles and other studies (unpublished studies).

Summary

This meta-analysis aims to address the abovementioned questions about the associations between the three aspects of paternalistic leadership and employee innovation. We examine the strength and direction of the associations of BL, ML, and AL with employee innovation in China. We expect BL and ML to correlate positively with innovation, but we are still curious about the possible difference in the size of these two associations. And we expect AL to relate negatively to innovation. We examine whether the size of the associations depends on sample features (the percentage of female employees and the percentage of employees with a college diploma or above) and methodological features (outcome measure, the type of evaluation, and the type of data collection method). We also test whether the strength and directions of the associations change over time (through the year of publication). Finally, the moderating effect of the type of publication is assessed as a supplement to the publication bias test.

METHODS

Literature Search and Inclusion Criteria

Three searching strategies were used to find relevant studies. First, we searched online databases EBSCO, Elsevier Science

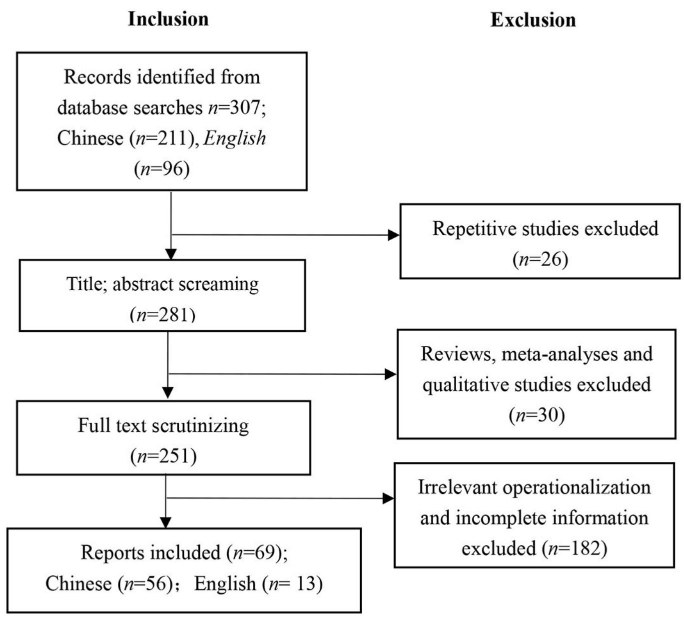

FIGURE 1 | Literature search and inclusion diagram.

Direct, PsycINFO, ProQuest, Springer, SAGE, Wiley, Summon, and Google Scholar, using a set of search terms including paternalistic leadership, benevolence leadership, morality leadership, authoritarian leadership, innovation, creativity, creative behavior, China, and Chinese to collect studies published in English. Studies published in Chinese were collected by searching Chinese online databases CNKI, Wanfang Data, VPCS, Taiwan Academic Literature Database, Superstar Discovery, and Baidu Scholar, using a set of Chinese search terms translated from the English search terms above. Second, we carried out ancestor searches according to the reference lists of review articles and reports we obtained. Third, we contacted some scholars in this area to find out if there was any unpublished work they had conducted. Databases were searched up to January 2022.

Studies included in this meta-analysis had to meet the following criteria: First, they had to be quantitative studies, and reviews and qualitative studies were excluded. Second, studies should report the measures. Third, studies had to adopt the measures of paternalistic leadership, which are relevant to the conceptualization proposed by Farh and Cheng (2000). Fourth, the information needed to calculate the overall effect sizes should be fully reported, including the sample size and *r*, or *t* value, *F*-value, or χ^2 that can be converted into *r*. Fifth, the selected samples must be independent of each other. If multiple studies are retrieved from the same sample, only one of them would be included. The procedures for inclusion and exclusion are presented in **Figure 1**. Sixth, only studies among Chinese employees (including employees from mainland China, Hong Kong, Macao, and Taiwan) were included in the analysis.

Finally, 69 studies (13 English articles and 56 Chinese articles) were included in this study. The literature screening process is shown in **Figure 1**.

Coding of Studies

For each study/independent sample, we coded (1) author and year of publication, (2) sample size, (3) effect size (*r*), (4) percent female respondents, (5) outcome measure, (6) type of publication (published and unpublished), (7) percent of employees with a college diploma or above, (8) type of data collection method (cross-sectional and longitudinal), and (9) type of evaluation method (supervisor- and self-evaluation). According to the coding standards proposed by Lipsey and Wilson (2001), Independent samples were used as the coding unit, and each independent sample was coded once. If there were multiple independent samples in a study, they were coded separately. The coding result is presented in **Table 1**. Sample characteristic is presented in **Table 2**.

Data Analysis

Effect Size

Data were analyzed using Comprehensive Meta-Analysis software (CMA) 3.0. CMA uses Hedges–Olkin method (Hedges and Olkin, 1985; Borenstein et al., 2011) to transform and aggregate the correlation coefficients. This study used correlation coefficients to summarize the relationships between the three dimensions of paternalistic leadership and employees' innovation. Correlations were first transformed to Fisher's z to stabilize the variance. $\mathbf{Z_i} = \mathbf{0.5} \ln [(\mathbf{1}-\mathbf{r_i})/(\mathbf{1}+\mathbf{r_i})]$. The z-value was then weighted and transformed back to *r*, the overall effect sizes. $\mathbf{r} = (\mathbf{e^{2z}} - \mathbf{1})/(\mathbf{e^{2z}}+\mathbf{1})$.

Model Selection

To examine whether the random-effects model or fixed-effect model should be selected to obtain the overall effect size, we used Cochran's Q statistic and I^2 statistic as two indicators of the heterogeneity test. $Q >$ critical value and $p < 0.05$ indicate

TABLE 1 | Sample information.

References	*n*	Type of publication	% College	% Female	Type of evaluation	Data collection	Outcome measure	r_{BL}	r_{ML}	r_{AL}
Cai (2017)	172	Unpublished	97	52.3	Self	Cross-sectional	SB	0.201	0.256	−0.151
Cai et al. (2018)	568	Published	NA	46.5	Supervisor	Cross-sectional	Other			0.307
Chang et al. (2016)	637	Published	96.1	52	Self	Cross-sectional	Other	0.5	0.46	−0.24
Chen and Hou (2016)	291	Published	NA	19	Supervisor	Longitudinal	Other		0.11	
Chen et al. (2013)	176	Published	NA	13.7	Supervisor	Cross-sectional	ZG	0.56	0.42	−0.39
Chen (2018)	251	Unpublished	95.63	50.6	Self	Cross-sectional	SB	0.289	0.328	0.23
Chen et al. (2019)	448	Published	NA	44.5	Self	Cross-sectional	Other	0.31	0.412	−0.136
Cheng (2020)	282	Unpublished	92.2	56.7	Self	Cross-sectional	Cri	0.386	0.445	−0.359
Du and Wang (2020)	358	Published	NA	48.3	Self	Cross-sectional	SB	0.488	0.499	−0.384
Fang (2021)	224	Unpublished	NA	28.7	Supervisor	Cross-sectional	JA		0.34	
Feng (2009)	361	Unpublished	NA	45.2	Self	Cross-sectional	Other	−0.059	−0.038	0.088
Fu et al. (2012)	159	Published	NA	NA	Self	Cross-sectional	JA	0.31		−0.13
Gao (2013)	191	Unpublished	NA	NA	Supervisor	Cross-sectional	Other	0.19	0.03	−0.1
Ge (2012)	304	Unpublished	94.08	49.67	Self	Longitudinal	Other	0.37	0.41	−0.2
Gu et al. (2018)	325	Published	74.5	13.5	Supervisor	Cross-sectional	other			−0.23
Gu et al. (2020)	233	Published	91.42	31.33	Supervisor	Cross-sectional	ZG	0.18	0.19	−0.03
Gu et al. (2020)	125	Published	100	39.2	Supervisor	Cross-sectional	ZG	0.06	0.17	−0.01
Gu et al. (2015)	160	Published	93.12	28.12	Supervisor	Cross-sectional	ZG		0.33	
Guo et al. (2018)	192	Published	NA	56.2	Supervisor	Longitudinal	other			−0.2
Han (2018)	384	Published	95.6	45.7	Self	Cross-Section	Other	0.739	0.645	−0.415
Hou et al. (2019)	190	Published	NA	NA	Supervisor	Cross-sectional	Other	0.494	0.558	0.414
Huang (2012)	281	Unpublished	96.8	42.3	Supervisor	Longitudinal	JA	0.073	0.154	−0.15
Jia (2016)	193	Unpublished	95.83	46.11	Self	Cross-sectional	Other	0.59	0.43	−0.32
Jiang and Gu (2015)	167	Published	NA	31.7	Supervisor	Cross-sectional	ZG	0.38		
Jin et al. (2016)	127	Published	NA	NA	NA	Cross-sectional	Other	0.145	0.195	0.39
Li and Wu (2019)	2884	Published	89.28	52. 74	Self	Cross-sectional	Other	0.452	0.37	0.134
Li and Wang (2021)	230	Published	63	43.3	Supervisor	Cross-sectional	JA	0.338	0.109	−0.316
Li et al. (2014)	312	Published	89.1	50	Self	Cross-sectional	SB	0.195	0.2	−0.126
Liang (2020)	325	Published	NA	NA	Self	Cross-sectional	SB	0.769	0.789	−0.732
Liu (2016)	436	Unpublished	100	38.4	Self	Cross-sectional	SB	0.163	0.067	−0.176
Liu (2018)	447	Unpublished	95.08	52.13	Self	Cross-sectional	Other	0.504	0.426	0.246
Ma (2012)	113	Unpublished	74	NA	Supervisor	Longitudinal	Other	0.22	0.306	−0.202
Ma and Zhang (2018)	232	Published	94.8	51.7	Supervisor	Longitudinal	JA			−0.321
Pan et al. (2013)	194	Published	NA	49	Supervisor	Cross-sectional	other			−0.01
She (2020)	290	Unpublished	NA	37.59	Self	Cross-sectional	Cri	0.223	−0.029	−0.184
Shen et al. (2017)	215	Published	70.3	54.4	Supervisor	Longitudinal	SB	0.31		
Shi and Li (2014)	510	Published	NA	NA	Self	Cross-sectional	other	0.626		−0.295
Tang (2016)	181	Unpublished	90.06	56.91	Self	Cross-sectional	Other	0.231	0.241	−0.072
Tian and Sanchez (2017)	302	Unpublished	93	44	Supervisor	Cross-sectional	SB	0.37		−0.02
Wang and Cai (2016)	1123	Published	74.8	NA	Self	Cross-sectional	Other	0.326	0.414	−0.082
Wang and Cheng (2010)	167	Published	NA	37	Supervisor	Cross-sectional	ZG	0.33		

(Continued)

TABLE 1 | Continued

References	*n*	Type of publication	% College	% Female	Type of evaluation	Data collection	Outcome measure	r_{BL}	r_{ML}	r_{AL}
Wang and Liu (2017)	447	Published	NA	NA	Self	Cross-sectional	Other	0.403	0.38	−0.246
Wang and Xing (2019)	233	Published	31.2	19.3	Self	Longitudinal	other			0.041
Wang (2019)	310	Published	NA	NA	Self	Cross-sectional	Cri	0.407	−0.355	−0.028
Wang et al. (2019)	378	Published	NA	58.2	Self	Cross-sectional	Other	0.23	0.18	−0.08
Wang Z. et al. (2021)	441	Published	NA	55.1	Supervisor	Longitudinal	SB	0.35		
Wang (2015)	450	Published	NA	40. 78	Supervisor	Cross-sectional	SB	0.431		−0.109
Wang (2018)	356	Unpublished	NA	NA	Self	Longitudinal	SB	0.718		−0.632
Wang Y. W. et al. (2021)	284	Published	NA	NA	Self	Cross-sectional	SB			0.207
Wang A. C. et al. (2018)	275	Published	NA	43.3	Supervisor	Cross-sectional	Other		0.37	
Wang and Wang (2019)	376	Published	NA	59	Self	Cross-sectional	SB	0.3		
Wei and Li (2021)	330	Published	NA	51.8	Self	Cross-sectional	other	0.68		
Wei and Wang (2020)	230	Published	NA	41.3	Supervisor	Cross-sectional	JA		0.45	
Wei et al. (2018)	250	Published	NA	32.2	Self	Cross-sectional	other	0.426		
Wei et al. (2017)	325	Published	74.2	13.5	Self	Cross-sectional	ZG		0.161	
Wu (2018)	196	Published	99.99	45.92	Self	Cross-Section	Other	0.465	0.502	−0.302
Xia (2020)	1305	Published	NA	35.63	Supervisor	Longitudinal	other	0.25		
Xia et al. (2021)	297	Published	100	NA	Supervisor	Longitudinal	other	0.4		0.3
Xie (2019)	357	Published	NA	NA	Self	Cross-sectional	SB	0.258		
Xu et al. (2014)	208	Published	93.3	33.2	Supervisor	Cross-sectional	ZG		0.213	
Xu (2020)	358	Unpublished	100	47.6	Self	Cross-sectional	Other	0.441	0.394	−0.329
You (2007)	315	Unpublished	71.7	39.7	Supervisor	Cross-sectional	SB			−0.24
You (2020)	178	Unpublished	86.3	58.8	Self	Longitudinal	Other	0.315	0.26	0.114
Zeng (2012)	271	Unpublished	95.57	45	Self	Cross-sectional	Other	0.356	0.332	−0.128
Zeng (2020)	335	Published	96.4	44.8	Self	Cross-sectional	other			−0.559
Zhang (2016)	264	Unpublished	94.7	47	Self	Cross-sectional	Other	0.737	0.709	−0.605
Zhang et al. (2015)	301	Published	NA	NA	Self	Cross-sectional	Other	0.355	0.169	−0.092
Zhao and Nie (2018)	394	Published	100	48.22	Self	Cross-sectional	JA	0.74	0.61	−0.24
Zhou (2021)	522	Unpublished	100	49.8	Self	Cross-sectional	ZG	0.477	0.425	−0.4
Zhu (2009)	301	Unpublished	88.7	58.5	Self	Cross-sectional	JA	0.2685		−0.029

69 studies, 13 studies in English, 56 studies in Chinese; SB, the innovative behavior scale developed by Scott and Bruce (1994); JA, the innovative behavior scale developed by Janssen (2000); ZG, the creativity scale developed by Zhou and George (2001); Cri, the Bootlegging innovation scale developed by Criscuolo et al. (2014); Other, other scales used twice or less by the studies included.

that samples are heterogeneous, and a random-effects model is more recommended; otherwise, a fixed-effect model should be performed (Borenstein et al., 2010). I^2 exceeding 25, 50, and 75%, respectively, indicates that low, medium, or high heterogeneity exists among the study samples (Higgins et al., 2003).

Publication Bias Test

Funnel plot and fail-safe number (N_{fs}) were used to test the publication bias. N_{fs} coefficient is the number of studies that reported results required to refuse a conclusion. The larger N_{fs} is, the more reliable the meta-analysis results are. When N_{fs} is $>5k$ +10, there is less possibility of publication bias (Rothstein et al., 2005).

Moderator Test

Mixed-effects between-level Q moderator analyses (Borenstein et al., 2010) were adopted to examine the moderating effects of categorical moderators, including outcome measure, the type of evaluation (self-and supervisor-evaluation), data collection (cross-sectional and longitudinal), the type of publication (published articles and unpublished theses and dissertations). Fixed-effect meta-regression (Borenstein et al., 2010) was used to examine the moderating effects of continuous moderators,

TABLE 2 | Sample characteristic.

Characteristic	BL		ML		AL	
	k	*n*	*k*	*n*	*k*	*n*
Outcome measure						
CRI	3	882	3	882	3	882
JA	5	1,365	5	1,359	6	1,597
SB	13	4,351	6	1,854	12	4,002
ZG	5	1,265	7	1,749	4	1,056
Other	25	12,175	24	10,542	30	12,630
Year of publication						
2009–2014	11	3,033	8	2,104	12	3,375
2015–2021	43	17,623	37	14,282	43	16,792
Type of publication						
Published	33	14,602	19	5,319	33	13,798
Unpublished	21	6,054	25	10,942	22	6,369
Type of evaluation						
Supervisor	16	4,883	14	2,627	17	4,530
Self	37	15,646	30	13,332	37	15,510
Data collection						
Cross-sectional	45	17,166	39	15,092	45	17,540
Longitudinal	9	3,490	5	1,167	10	2,627
% Female						
Range	13.7–59%		13.5–58.8%		13.5–58.8%	
% College						
Range	63–100%		63–100%		31.2–100%	
Overall	54	20,656	45	16,386	55	20,167

BL, benevolent leadership; ML, moral leadership; AL, authoritarian leadership.

including gender (the percentage of females), year of publication, and educational level (the percentage of employees with a college diploma or above).

RESULTS

Sample Description

Heterogeneity

The results of heterogeneity are shown in **Table 3**. Cochran's Q statistics of studies on benevolent leadership (BL), moral leadership (ML), and authoritarian leadership (AL) reached a statistically significant level ($p < 0.001$). The I^2 values of the three leadership styles and employee innovation were >75%. Therefore, it is more reasonable to fit random-effects models to compute the overall effect sizes in this study.

Publication Bias

The results of publication bias tests are shown in **Figure 2** and **Table 3**. According to the funnel plots of studies, most studies were located at the top and evenly distributed on both sides, and the funnel plots are generally symmetrical.

In addition, according to **Table 3**, the N_{fs} coefficients of BL, ML, and AL are 46,234, 20,577, and 5,481, respectively, which are much higher than $5k + 10$, indicating that this study is not affected by publication bias and the research conclusion is robust and reliable.

Main Effect Analysis

Table 3 shows the results of the main effect tests. BL ($r = 0.40$, $p < 0.001$) and ML ($r = 0.33$, $p < 0.001$) were significantly positively correlated with employees' innovation with medium effect sizes, while AL was significantly negatively correlated with employees' innovation with small effect size ($r = -0.15$, $p < 0.001$), supporting H1, H2, and H3.

Moderator Analysis

For continuous moderators, the results of meta-regression are shown in **Table 4**. The moderating effects of gender (the percentage of female respondents) were significant. The percentage of females in the samples could positively predict the effect sizes of the relationships between the three dimensions of paternalistic leadership and innovation, indicating that the more female employees in the samples, the stronger the positive effects of BL and ML, and the smaller the negative effect of AL on innovation, supporting H4.

The education level of employees significantly moderated the relationship between paternalistic leadership and employees' innovation. The percentage of employees with a college diploma

TABLE 3 | Main effects and publication bias tests.

				95% CI for *r*					
	k	*N*	*r*	*LL*	*UL*	*Z*	*Q*	I^2	N_{fs}
BL	54	20,656	0.396	0.344	0.445	13.627***	984.269***	94.615	46,234
ML	45	16,386	0.329	0.266	0.390	9.645***	857.072***	94.866	20,577
AL	55	20,167	−0.151	−0.220	−0.080	−4.158***	1399.605***	96.142	5,481

*BL, benevolent leadership; ML, Moral leadership; AL, authoritarian leadership; k, the number of independent samples; N, cumulative number of samples; CI, confidence interval; LL, lower limit; UL, upper limit, Q value and its significance represent the degree of heterogeneity, and I^2 represents the proportion of heterogeneity in the total variation; *p < 0.05, **p < 0.01, ***p < 0.001.*

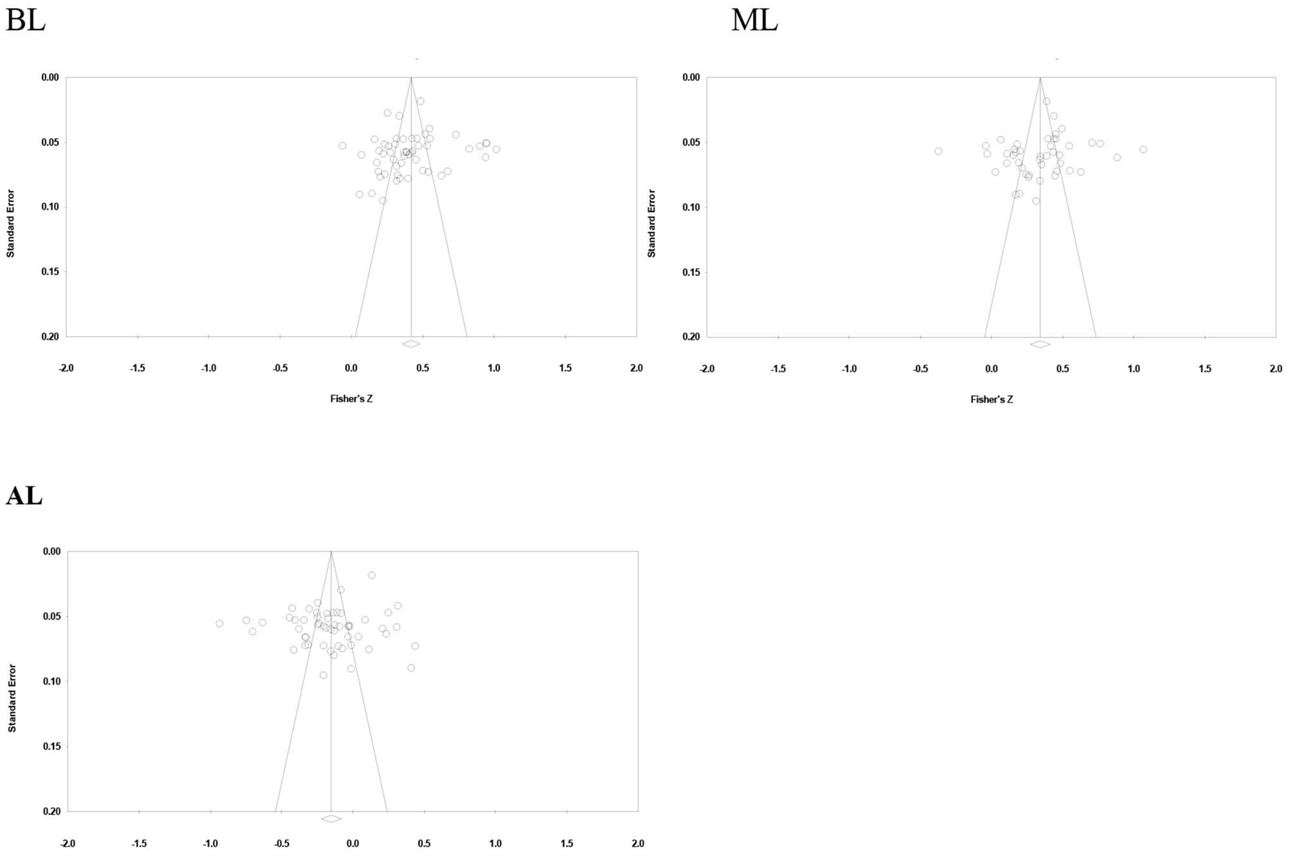

FIGURE 2 | Funnel plot; BL, benevolent leadership; ML, moral leadership; AL, authoritarian leadership.

or above could positively predict the effect sizes of BL and ML but negatively predict the effect sizes of AL, supporting H5 and H6.

Year of publication could positively and significantly moderate the relationship between BL, ML, and employees' innovation. The positive effects of BL and ML on innovation in recent years were greater than those about a decade ago. However, the year of publication could not moderate the relationship between AL and innovation, which does not support H10.

For categorical moderators, the results of between-level *Q* moderator analyses are shown in **Table 5**. The type of evaluation (supervisor- vs. self-evaluation) could moderate the relationships between BL, ML, and innovation significantly (*ps* $\leq$ 0.063), and there were stronger correlations under the self-evaluation of innovation, while the moderating effect was not significant for AL. The moderating effects of outcome measure, data collection method, and publication type were not significant.

DISCUSSION

Relationship Between Paternalistic Leadership and Employee Innovation

This meta-analysis demonstrates medium positive associations of benevolent leadership (BL) and moral leadership (ML) with Chinese employees' innovation and a small negative association between authoritarian leadership (AL) and Chinese employees' innovation.

The positive effects of BL and ML and the negative effect of AL found in this study are similar to some previous empirical studies (e.g., Wu, 2018; Cheng, 2020) and a last multinational meta-analysis focusing on employee overall performance (Hiller et al., 2019). Our findings verified the robustness of the positive correlation between BL and ML and employee innovation and the negative correlation between AL and employee innovation among Chinese employees. These findings are consistent with our H1 and H2 proposed based on the employee creativity formation mechanism model (Wang et al., 2010) and self-determination theory (Deci and Ryan, 1985, 2000). That said, effect sizes differed depending on several moderators, which we now discuss.

Moderating Factors

The associations between the three aspects of paternalistic leadership and employee innovation are moderated by the percentage of females in the samples, the percentage of employees with a higher educational level, publication year, and evaluation type.

Gender is one of the essential moderators. A higher proportion of female employees in an organization will result in stronger positive associations of BL and ML with employees' innovation. Meanwhile, it will also result in a weaker negative relationship between authoritarian leadership and employees' innovation. This result verifies our hypothesis and supports role congruity theory, indicating that women's relatively greater relationship orientation (Boatwright and Forrest, 2000) might not only be a promotive factor but a protective factor in the relationship between paternalistic leadership and employee innovation. To date, all the research performed have been focusing on the role of women in the workplace (e.g., Browne, 1998; Cheng et al., 2011; Kato and Kodama, 2017; Zhou and Zhou, 2017; Sposato, 2021). Future research can further examine the unique role of female employees in innovation.

Employee educational background also plays a role in the association between paternalistic leadership and innovation. A higher proportion of employees with a college diploma or above in samples can strengthen the positive associations of BL and ML with employee innovation and the negative association between AL and innovation. Such findings are consistent with our H5 and H6 proposed based on the previous understanding of what educated employees value at work (respect, emotional incentive, and autonomy; Oldham and Cummings, 1996; Shalley et al., 2004).

Publication year moderates the associations of BL and ML with innovation, but it cannot moderate the relationship between AL and innovation. With the development of Chinese society in the past 10 years, BL and ML are thus becoming increasingly conducive to innovation. This finding is consistent with H9. Current Chinese employees value respect, emotional incentive, and justice at work more than before, probably caused by the ongoing socioeconomic and cultural changes in China (see Xu and Hamamura, 2014; Cao, 2020). Thus, BL and ML initially become greater promotors for their intrinsic motivation, resulting in more innovative behaviors. However, unexpectedly, the association between AL and innovation cannot be moderated by publication year, which is inconsistent with our hypothesis about the changing attitude of Chinese employees toward authoritarian leaders. A possible explanation is that although Chinese employees value a respectful, caring, and fair working environment in recent years more than before, their attitude toward authority in the workplace has not changed essentially. Authority has been long deeply rooted in Chinese Confucian culture and Chinese people's minds. It has also played a significant role in every corner of society and people's lives. Thus, people's attitudes toward authority tend to be stable.

The significant/marginally significant moderating effects of evaluation types of innovation in the associations of BL and AL with innovation are partially consistent with our H7 and H8, indicating that common method biases might have existed in previous studies. As predicted, the mean effect size in past studies that adopted self-evaluation ($r = 0.433$) is larger than those that used supervisor evaluation ($r = 0.317$) in the relationship between BL and innovation. The relatively small effect size of 0.317 is still statistically significant and considered medium. That is, although a single study may overestimate the effect size because of the common method bias caused by self-evaluation, the impact of self-evaluation is not that essential in general and is relatively acceptable for this meta-analysis. However, in the association between AL and innovation, the difference between self and supervisor evaluation is essential, and supervisor evaluation yields a weak mean effect size (−0.067 vs. −0.202) and is insignificant. This finding implies that the association between AL and innovation can be overestimated. Thus, we should be cautious when explaining related results. The moderating effect of evaluation type is insignificant in the relationship between ML and innovation. No common method bias, which impacts the association between ML and innovation, is found.

The moderating effects of the type of outcome measure (innovation scales that the studies used) were not significant. The associations are stable over different measurement tools in general except for the weak association between ML and innovation measured by Cri (Criscuolo's innovation scale). This might be because only three studies are adopting Cri, and the result is more easily influenced by the large between-study variance caused by random errors.

Finally, the type of publication and the type of data collection method are not moderators between paternalistic leadership and

TABLE 4 | Moderating effects of continuous variables (meta-regression analysis).

Moderator	*k*	*Estimate*	*SE*	*LL*	*UL*	*Z*	*Q* $_{model}$
BL							
% Female	38	0.003	0.001	0.001	0.005	3.222**	10.381***
Year of publication	54	0.017	0.002	0.012	0.021	6.933***	48.063***
% College	29	0.006	0.001	0.004	0.008	5.696***	32.450***
ML							
% Female	35	0.006	0.001	0.004	0.008	6.724***	45.218***
Year of publication	44	0.021	0.003	0.015	0.027	7.093***	50.305***
% College	28	0.005	0.001	0.002	0.007	4.136***	17.104***
AL							
% Female	39	0.002	0.001	0.000	0.004	1.731	2.996
Year of publication	55	0.001	0.002	−0.003	0.006	0.617	0.381
% College	33	−0.003	0.001	−0.004	−0.001	−3.889***	15.127***

*BL, benevolent leadership; ML, moral leadership; AL, authoritarian leadership; LL, lower limit; UL, upper limit; *p < 0.05, **p < 0.01, ***p < 0.001.*

innovation. These results are inconsistent with our hypotheses, indicating that the results of this meta-analysis are not influenced by publication bias caused by previously published studies or common method bias caused by previous cross-sectional studies.

Limitations and Future Research

The present study still has several limitations: First, the vast majority of the samples included in this meta-analysis are from mainland China, and only two Taiwanese samples are included. We did not compare the potential difference between samples from the mainland and Taiwan because of the highly uneven sample numbers. Future research can compare the results from different regions of China, especially from Taiwan, Hong Kong, or Macao (when there are more empirical studies from these regions), which are quite different from the mainland in terms of economy, societal values, and culture.

Second, as most existing meta-analyses focusing on paternalistic leadership did, we treated paternalistic leadership as three separate dimensions without testing their interactions. However, in real workplace settings, the three aspects of paternalistic leadership usually appear together. In future research, some more advanced meta-analysis techniques, for example, meta-analytic criterion profile analysis (MACPA), are supposed to be adopted to comprehensively analyze the interactions of the three dimensions of paternalistic leadership.

Third, the moderators located in this research are still limited. A future study can explore the moderating effects of other moderators once there are sufficient information reported, especially team-level factors, for example, the characteristics of leaders (e.g., gender, educational level, and professional background), and organizational level factors such as industries, company size, and the type of company (state-owned, private, or public).

In addition, a future study can further elaborate on the associations between paternalistic leadership and different types of innovation (e.g., bootleg innovation, disruptive innovation, architectural innovation, radical innovation, etc.) and examine the difference among the different innovation types to find out which kind of innovation paternalistic leadership is most beneficial or harmful to.

Theoretical Implications

First, as mentioned above, our findings on the association between the three aspects of paternalistic leadership and innovation among Chinese employees are consistent with the hypotheses based on the employee creativity formation mechanism model and SDT, demonstrating the applicability of these two theories in the Chinese organizational context.

Second, the result of the moderator test on gender verified role congruity theory among Chinese employees. Our findings also reveal female employees' promotive-protective role in innovation. Future research can further construct a more holistic model for females' promotive-protective role in innovation in workplace settings.

Third, our findings on the moderating role of publication year partially support the theory of value change (Inkeles, 1969; Inglehart, 1997). However, publication year could not moderate the relationship between AL and innovation, indicating employees' stable attitude toward authoritarianism. As our analysis above, it might be because authoritarianism is a relatively stable component in Chinese culture. This finding reminds researchers that they should pay attention to the differences in their cultural backgrounds when using the theory of value change.

Practical Implications

This study found that benevolent leadership and moral leadership are beneficial for employee innovation, and authoritarian leadership might be harmful to innovation. Furthermore, the associations are moderated by subordinates' educational level and gender. According to these findings, we develop several practical implications of our findings for personnel appointments, organizational policy, and team leaders.

TABLE 5 | Moderating effects of categorical variables (subgroup analysis).

	Moderator	k	n	r	LL	UL	Z	Qb
BL	**Outcome measure**							1.220
	Cri	3	882	0.341	0.225	0.448	5.501***	
	JA	5	1365	0.376	0.063	0.621	2.335*	
	SB	13	4351	0.395	0.268	0.509	5.716***	
	ZG	5	1265	0.394	0.260	0.513	5.432***	
	Other	25	12175	0.414	0.342	0.482	10.195***	
	Type of evaluation							6.709**
	supervisor	16	4883	0.317	0.253	0.377	9.311***	
	Self	37	15646	0.433	0.369	0.493	11.932***	
	Data collection							0.558
	Cross-sectional	45	17166	0.405	0.348	0.458	12.743***	
	Longitudinal	9	3490	0.351	0.212	0.475	4.766***	
	Type of publication							1.299
	Published	33	14602	0.421	0.359	0.478	12.110***	
	Unpublished	21	6054	0.356	0.257	0.447	6.659***	
ML	**Outcome measure**							3.749
	Cri	3	882	0.026	−0.428	0.470	0.105	
	JA	5	1359	0.349	0.129	0.535	3.051**	
	SB	6	1854	0.393	0.112	0.616	2.687**	
	ZG	7	1749	0.279	0.178	0.374	5.279***	
	Other	24	10542	0.359	0.294	0.422	10.030***	
	Type of evaluation							2.073
	supervisor	14	2627	0.274	0.189	0.355	6.148***	
	Self	30	13332	0.357	0.277	0.432	8.245***	
	Data collection							1.679
	Cross-sectional	40	15092	0.339	0.271	0.403	9.200***	
	Longitudinal	5	1167	0.249	0.125	0.365	3.871***	
	Type of publication							0.582
	Published	19	5319	0.301	0.206	0.391	5.961***	
	Unpublished	26	10942	0.349	0.264	0.429	7.552***	
AL	**Outcome measure**							2.779
	Cri	3	882	−0.194	−0.374	0.001	$-1.947^{0.052}$	
	JA	6	1597	−0.200	−0.290	−0.105	−4.105***	
	SB	12	4002	−0.210	−0.382	−0.023	−2.200*	
	ZG	4	1056	−0.220	−0.423	0.004	$-1.925^{0.054}$	
	Other	30	12630	−0.103	−0.196	−0.009	−2.157*	
	Type of evaluation							$3.450^{0.063}$
	supervisor	17	4530	−0.067	−0.180	0.048	−1.142	
	Self	37	15510	−0.202	−0.285	−0.116	−4.547***	
	Data collection							0.005
	Cross-sectional	45	17540	−0.152	−0.228	−0.075	−3.841***	
	Longitudinal	10	2627	−0.145	−0.325	0.045	−1.494	
	Type of publication							0.332
	Published	33	13798	−0.134	−0.224	−0.042	−2.840***	
	Unpublished	22	6369	−0.176	−0.282	−0.066	−3.122**	

*BL, benevolent leadership; ML, moral leadership; AL, authoritarian leadership; superviso r, supervisor-evaluation; self, self-evaluation; LL, lower limit, UL, upper limit, *p < 0.05, **p < 0.01, ***p < 0.001.*

For Personnel Appointments

Leaders with greater BL and ML attributes than AL attributes should probably be considered to be in charge of a team or project with high requirements for innovation (e.g., R&D or marketing). And they might also fit better with a team composed of educated members. In addition, because a higher proportion of female members may be a promotive and protective factor for innovation, those creating an innovation project team may consider recruiting more women as team members.

For Organizational Policies

To facilitate employee innovation, organizations can encourage leaders to practice BL and ML through incentives, while policies that mitigate the effects of leaders' authority should also be implemented. For example, employees should be given the opportunity and channel to complain when they are subjected to improper authoritarian treatment by their superiors.

For Team Leaders

In future management practice, paternalistic leaders may improve their awareness of their leadership styles, emphasize authority less, and focus more on other aspects of paternalism (benevolence, morality, and responsivity) to foster employee innovation, especially when working with educated subordinates. In addition, leaders may also pay attention to the gender difference of subordinates in the effects of authoritarianism which may cause less innovative behaviors or more negative outcomes among male workers than female workers. Therefore, to mitigate the influence of AL on innovation, paternalistic leaders may show less authoritarianism, particularly to male subordinates.

Furthermore, in today's management practice, the function or dysfunction of paternalism might depend on whether a paternalistic leader can keep pace with the times. Currently, leaders are required to be flexible and agile due to the uncertain and rapidly changing circumstances that a team or organization may constantly encounter (Chen et al., 2022). Although paternalism is an order leadership style, it is not necessarily the opposite of agility. On the contrary, paternalistic leadership may function better in combination with agile leadership, the capability to adapt, renew itself, and thrive in a rapidly ambiguous, changing, and raging environment (Vecchiato, 2015; Salmen and Festing, 2021). Facing different objects and situations, different combinations or patterns of the three dimensions of paternalistic leadership can bring different leadership effects (Niu et al., 2009; Wang, 2018). Our findings also indicate that different aspects of paternalism affect innovation differently. Therefore, in managerial practice, paternalistic leaders can flexibly adjust their weight on each aspect of paternalistic leadership (benevolence, morality, and authority) and find the best combination of the three dimensions for the situations.

DATA AVAILABILITY STATEMENT

The datasets presented in this study can be found in online repositories. The names of the repository/repositories and accession number(s) can be found in the article/supplementary material.

AUTHOR CONTRIBUTIONS

LL and KZ contributed to the study's conception and design, performed data analysis, and wrote the first draft of the manuscript. Material preparation and data collection were performed by SZ and YW. All authors commented on previous versions of the manuscript, read, and approved the final manuscript.

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Analysis of the influence of enterprise managers' overconfidence on the overinvestment behavior of listed companies under the media reports

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At present, there is a common overinvestment behavior among listed companies in various countries, which seriously reduces the overall resource allocation efficiency of the market. With the rise of behavioral finance, it has become a new direction to study the influence of managers' "irrational characteristics" on enterprise overinvestment. With the rapid rise of the media industry, media reporting, as an external governance mechanism, supplements the capital market supervision system and has a huge impact on the investment behavior of enterprises. How media reports affects overinvestment and whether it can curb overinvestment caused by managers' overconfidence is still worthy of further study. This paper took 6,012 A-share listed companies from 2013 to 2021 as samples, and based on the perspective of "media reports," studies the impact of managers' overconfidence on overinvestment; explores whether positive and negative media reports have a moderating effect between overconfidence and overinvestment; studies the moderating effect of media reports under different marketization processes. Empirical conclusions: (1) Managers' overconfidence will lead to overinvestment of enterprises. (2) Positive media reports will aggravate the overinvestment caused by managers' overconfidence; negative reports can inhibit the overinvestment caused by managers' overconfidence. (3) In regions with higher marketization, positive media reports play a more significant role in aggravating overconfidence and leading to overinvestment; in regions with lower marketization, negative reports play a stronger role in restraining overconfidence and overinvestment.

KEYWORDS

external governance, marketization process, media reports, enterprise overinvestment, managers' overconfidence

Introduction

Investment activities play an important role in enterprise management. Enterprise investment is not only related to the short-term operation of the enterprise, but also to the long-term strategy of the enterprise, as well as the performance and future sustainable development of the enterprise (Dejuanbitria and Morasanguinetti, 2021; Sharpe and Suarez, 2021). In the current listed companies, the phenomenon of overinvestment is more serious than underinvestment (Li et al., 2020). During the 9-year period from 2006 to 2014, Dongfang Electric's net cash flow from enterprise investment activities was all less than zero. In such a financial predicament that cannot make ends meet, Dongfang Electric still conducts large-scale expansion (Mitan et al., 2021). Overinvestment has caused Dongfang Electric to repeatedly fall into financial crisis and shut down a large number of huge projects. In 2017, Wanda Hotel Development, a subsidiary of Wang Jianlin, issued an announcement to suspend all investment in Spain and sell all the shares of Spain Building (Yang et al., 2017). Wang Jianlin's investment in Spain ended with a loss of 200 million yuan, which means that Wanda completely lost to Spain. Due to the lack of scientific evaluation of investment projects, blind expansion and excessive investment led to the failure of Wanda's second overseas investment and acquisition in 2017.

In today's era of big data networks, the media industry has risen rapidly. The behavior and development status of listed companies are one of the main contents of media attention and reports (Kim et al., 2021). **Figure 1** counts the number of reports on Shanghai and Shenzhen A-share listed companies by eight authoritative mainstream media such as China Securities Journal during the period from 2013 to 2021. It can be seen that whether it is positive or negative, the number of media reports on companies is on the rise (Du and Li, 2021). The media has become an important bridge and link between public investors, enterprises and the capital market. The voice of the media will have a huge impact on the decision-making and development of enterprises and the investment direction of investors (Johnson et al., 2022).

China's Yinguangxia Trap, melamine milk powder and other incidents have made society and enterprises understand the role of the media (Halawani et al., 2020; Klein et al., 2021). On February 15, 2019, China Securities Journal and other media exposed that there are major food safety problems in Sanquan dumplings. After February 15, the number of relevant media reports began to increase. As of February 18, the number of relevant media reports exceeded 3,000, and it was still on the rise. This negative news led to a rapid decline in the stock and sales of Sanquan Foods, resulting in heavy losses, and major platforms removed related products one after another. More seriously, the reputation and value of the company have been greatly affected, and it has also greatly slowed down the further investment of Sanquan Group. In just a few days, the stock price of Sanquan Foods fell by 5%. According to the financial report data released by Sanquan Foods, the operating income of dumplings in the first half of the year fell by as much as 17.59% year-on-year, which led to the large-scale removal of Sanquan products online and offline (Chen and Chen, 2022).

Traditional financial theories are based on the premise and assumption that managers are completely rational people, and often attribute overinvestment to principal-agent conflicts (Kariuki et al., 2020; Sun et al., 2021). However, in real economic activities, managers are not "completely rational," and individual managers' behavioral decisions and judgments often deviate from rationality, and subjective errors often occur due to psychological factors (Wong, 2020; Zhang and Chen, 2020; Gupta et al., 2021). With the deepening of research, psychology, finance and management are gradually combined, and factors related to the irrational and heterogeneous characteristics of managers have begun to be taken into account (Bortoli et al., 2019). The rise of behavioral finance has made up for the defect of traditional finance that is based on the premise of a completely rational economic man (Araújo Júnior et al., 2019; Wu et al., 2022a). Roll (1986) is the pioneer of introducing "overconfidence" in the study of business management issues, and believes that overconfidence psychology will directly affect managers' investment decisions, and eventually lead to overinvestment. In recent years, many scholars have carried out in-depth research from the point of view of overconfidence, and the research on the relationship between overconfidence and overinvestment has gradually matured (Wan et al., 2021; Yong et al., 2021). But how exactly is the variable overconfidence measured? Does it necessarily lead managers to make overinvestment decisions? These issues still deserve further exploration.

Existing literature rarely studies the combination of managerial overconfidence, media reports, and overinvestment. Can media reports restrain and regulate excessive investment behaviors caused by irrational psychology? Do positive and negative reports have different effects on overinvestment caused by managers' irrational psychology? There is no consistent conclusion on these issues yet, and they are still worthy of in-depth analysis and discussion. In addition, many countries have vast territory and many regions, and are in the critical stage of market economy transformation, and the marketization process varies greatly. Under different marketization processes, media reports will have different responses to enterprises and society (Akbar et al., 2022). Therefore, based on the perspective of media reports, this paper explores the relationship between managers' overconfidence and enterprise overinvestment. In addition, this paper includes the marketization process into the research scope, and discusses the role and impact of positive and negative media reports on the overinvestment caused by managers' overconfidence under different degrees of marketization process.

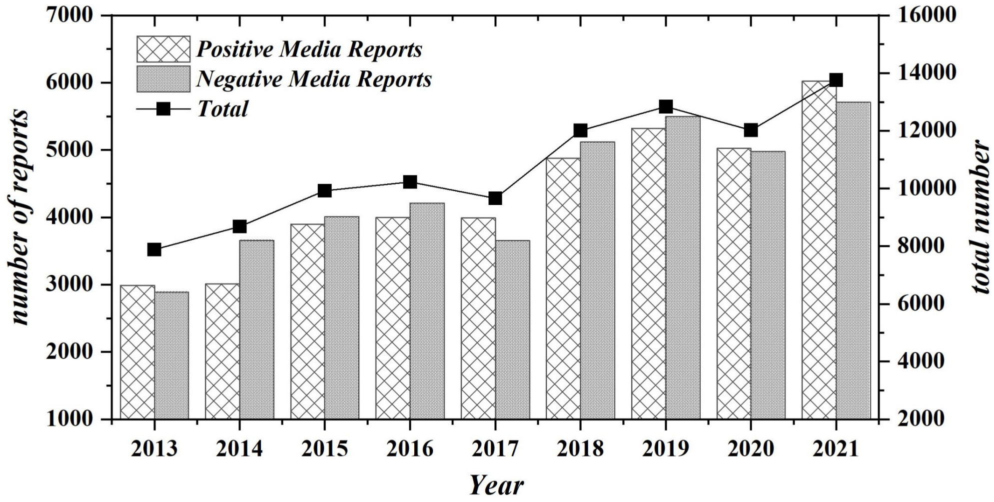

FIGURE 1
Times of mainstream media reports on listed companies from 2013 to 2021.

Section is "Introduction," which points out the research background and significance. Section is "Literature review," which analyzes the research achievements and deficiencies of domestic and foreign literature, and lays the foundation for the research design of the following. Section "Research hypothesis" carries on the theoretical analysis and puts forward the research hypotheses. This part firstly analyzes related content such as overconfidence, overinvestment, media reports and marketization process, and then puts forward three hypotheses in this paper. Section "Research design" is the design of the research. This part designs the empirical research in this paper, including data sources, selection of variables, and the design and establishment of empirical models. Section "Empirical test and result analysis." The three hypotheses of this paper are verified by a series of statistical methods, and the robustness test is carried out. Finally, the results are analyzed and explained in detail. Sections "Discussion" and "Conclusion," respectively. On the basis of empirical test and result analysis, this paper puts forward relevant policy suggestions from the enterprise, media and government levels to improve the efficiency of enterprise investment. Finally, the shortcomings of this paper are summarized and future prospects are proposed.

Literature review

Overconfidence and overinvestment

In the early literature on overinvestment, most of them were based on principal-agent theory, and did not pay attention to the impact of managers' own irrational behavior on the investment decision and development of enterprises. Mu et al. (2020) found that overconfident managers lack the ability to rationally analyze, and often misjudge the project's net present value and rate of return, resulting in overinvestment. In addition, considering the effect of manager gender on this relationship, the overinvestment caused by overconfidence of male managers will be more serious (Liu, 2022). Because male managers have more aggressive venture capital preferences than female managers, and analyst tracking can moderate irrational behaviors caused by overconfidence (Valaskova et al., 2021). Wan et al. (2022) focused on the relationship between overconfidence and overinvestment under different property rights. The argument shows that many of the investment expansion activities of private enterprises are caused by the overconfidence of managers, which is related to the more restrictions on investment and the greater social responsibility of state-owned enterprises.

But not all scholars agree that the impact of overconfidence on business is negative. Managers with overconfidence tend to have the spirit of unyielding, innovative and enterprising spirit, which will also bring positive effects to the enterprise to a certain extent. Hijjawi et al. (2021) believes that overconfident managers also have a positive side for companies. Overconfident managers can more accurately identify high-yield investment opportunities. Ying (2022) believes that managers' overconfidence has a positive impact on the company's investment level. Mirzaei and Samet (2022) also believe that overconfident managers tend to have stronger insight and more professional financial capabilities, and maximize the benefits from investment.

Media reports and overinvestment

The media is the bridge between enterprises and the public, and influences enterprise investment decisions mainly through three channels: Information efficiency mechanism, pressure and supervision mechanism, and reputation mechanism (Al-Dmour et al., 2022). First, the media transmits enterprise information to the public in a timely manner, which can reduce the information asymmetry between the two parties and enable the public and investors to make correct investment decisions from a fair and comprehensive perspective. Second, through the exposure of the media, the society strengthens the visible supervision of various regulatory departments through this invisible supervision, which will cause certain pressure on the managers of the exposed enterprises, and also bring a warning effect to other enterprises. Third, negative media reports can put a company in a dilemma of public opinion and reputation. Under pressure from the media, management strives to improve enterprise governance, enhance the company's reputation, and save its image in the minds of the public and investors (Burke, 2022; Ed-Dafali et al., 2022; Zhao et al., 2022b).

O'Neill and Qu (2010) and Li et al. (2018) were the first to study the relationship between media reports and enterprise governance in a theoretical and systematic manner. They selected the 50 worst boards as rated by Boards magazine in 2004 for the study sample and found that media reports draws public attention. Among them, negative reports will have a great negative impact on the reputation of managers, prompting managers to effectively reduce overinvestment behaviors and make decisions that will weaken enterprise value (Lu, 2022). In terms of reputation mechanism, Li et al. (2019) and Poursoleyman et al. (2022) pointed out that the invisible supervision of the media will prompt managers to improve the investment efficiency and governance level of enterprises. Through media reports, it is possible to urge the administrative department to intervene to conduct more effective supervision, thereby reducing the irrational investment behavior of enterprises, restraining excessive investment, and achieving the effect of enterprise governance (Lee et al., 2022).

He et al. (2020) concluded that the role of the media comes from two mechanisms: one is the reputation mechanism. If an enterprise is exposed by the media, it will seriously affect the reputation and image of enterprise managers. In order to save their own reputation and enterprise image, managers will improve their decision-making ability (Wu et al., 2022b). The second is the role of information transmission. If there is no media, a lot of information about the enterprise cannot be transmitted to the public and investors, and serious information asymmetry will lead to investors unable to accurately assess the value of the enterprise (Indremo et al., 2022). Similar to the reputation mechanism, Su and Alexiou (2020) from the perspective of earnings management focused on the mechanism by which media reports would generate market pressure on executives, thereby improving enterprise governance (Burke, 2022).

There is no consensus on the relationship between media reports and enterprise overinvestment. Cui and Shi (2017) combined emotion theory and believed that media reports and exposure would attract the attention of many investors, stimulate investor sentiment, stimulate their investment intention and investment interest, and lead to further overinvestment by enterprises. Choiriah et al. (2021) found that despite frequent media reports on relevant news, it did not alleviate the tunnel behavior of major shareholders and did not improve the company's investment efficiency. Huang et al. (2022) started from managers' emotions and concluded that positive media reports will aggravate managers' overestimation of their own abilities and thus make overinvestment. However, the results of the study found that the impact of negative media reports was actually minimal. However, Greo (2021) and Mundi and Kaur (2022) believe that the media does not have a unilateral impact on investment efficiency, but has both positive and negative impacts. Media reports can attract managers' attention, improve investment prudence, and make more rational investments. However, some negative reports or news reports with exaggerated elements will affect managers' emotions, shake managers' confidence, and reduce investment efficiency. Blair et al. (2022) verified the market pressure hypothesis of the media from an audit perspective. The media can enhance the power of external audit, reduce the motivation of enterprise profit management, and effectively realize the role of enterprise governance.

Overconfidence, media reports, and overinvestment

Regarding how to alleviate and alleviate the problem of overinvestment caused by overconfidence, most scholars study whether there is a moderating effect in combination with the internal enterprise governance mechanism of the company, and there are few studies on the relationship between the three from the external perspective of media reports. At present, only Huang et al. (2022) and Zhao et al. (2022a) have conducted research on the relationship between the three and reached similar conclusions, but they are only limited to negative media reports. Zhao et al. (2022a) conducted a study on A-share listed companies from 2009 to 2018 and found that negative media reports can play a positive role, reduce managers' overconfidence, and have a certain negative adjustment to low-efficiency investment. Huang et al. (2022) also analyzed that negative reports as a moderating variable can reduce the positive correlation between overconfidence and overinvestment, and further divide the nature of property rights. It is found that negative media reports have a stronger inhibitory effect on state-owned enterprises than non-state-owned enterprises.

Research hypothesis

Impact of managers' overconfidence on enterprise overinvestment

With the rise of behavioral finance, psychological factors are applied to economic management analysis, and many economic phenomena have more reasonable explanations. Overconfidence, as a very widespread and ubiquitous irrational psychology, has been deeply valued and studied by scholars at home and abroad. Roll first pioneered the "arrogance theory," arguing that managers will be driven by overconfidence and prefer to expand abroad, resulting in excessive investment behavior. Huang et al. (2022) expanded the scope of enterprise managers from a single manager to the entire company management, and found that the two are still positively correlated. Greo (2021) and Mundi and Kaur (2022) pointed out that managers with overconfidence will be keen on enterprise expansion strategies and realize enterprise expansion by increasing investment in mergers and acquisitions, but the result will increase the possibility of companies falling into financial crisis. Blair et al. (2022) refined the scope of investment and defined it as the investment in fixed assets by enterprises. The results found that the higher the level of managers' overconfidence, the more investment in fixed assets by enterprises. Managers' confident mentality has a significant effect on investment decisions, and when the highest level of self-confidence is reached, that is, overconfidence, it will lead to alienation of enterprise investment behavior and overinvestment (Kunjal et al., 2021; Akbar et al., 2022).

When the net present value of an investment project is positive, the project can be initially identified as a project that can be invested; on the contrary, the project is likely to be a negative-return project and should not be invested. As an important decision maker in the company's investment activities, managers will have a certain sense of superiority, and their decisions will be greatly affected by their own psychological factors. managers' overconfidence usually have high investment enthusiasm and preferences, are overly optimistic about investment prospects, overly affirm and trust their own judgments, and ignore the possibility of investment failure and market risks (Jiang and Akbar, 2018). Such a mental state will lead managers to have a stronger investment intention and make wrong judgments and decisions. On the other hand, managers driven by their own interests and their desire to build a "business empire" will further encourage their willingness to invest blindly, leading to overinvestment. At the same time, due to the existence of information asymmetry, shareholders cannot supervise the behavior of managers at all times, and the purpose behind managers' decisions is often difficult to detect. Managers lack necessary constraints when making investment decisions, which further leads to overinvestment (Xu and Liu, 2020). Therefore, this paper proposes the hypothesis H1:

> Hypothesis H1: managers' overconfidence leads to overinvestment in the enterprises.

Moderating effect of media reports on managers′ overconfidence and overinvestment

With its own advantages, the media has built a bridge of communication between enterprises and investors, which can effectively alleviate agency conflicts and information asymmetry to a large extent, improve the overall resource allocation efficiency of the market, and play a role in enterprise governance. Media reports will greatly affect the investment efficiency of enterprises. The media timely and objectively transmit the information of the enterprise to the public and investors. Investors will screen and judge the information and then make a decision whether to invest or not. Enterprise managers will further make investment decisions based on market reactions (Bulathsinhalage and Pathirawasam, 2017). In addition, managers determine the investment direction of enterprises, and managers' psychology will largely influence their investment decisions (Fan et al., 2022). In this ever-changing information age, the media industry is developing rapidly, and the media can timely report the information and status of various enterprises in the capital market by virtue of their advantages such as large influence and fast information transmission speed. The media reports on enterprises will have an important impact on managers' psychology, especially overconfidence, which in turn affects enterprise managers' investment decisions and enterprise investment efficiency, becoming one of the external governance mechanisms of enterprises (Cragun et al., 2019; Ahmed et al., 2020; Gao et al., 2021).

The effect mechanism of media reports on managers' overconfidence and overinvestment is mainly through the media's supervision mechanism and reputation mechanism. According to the emotional color of media reports, there are two types of media reports: positive reports and negative reports. Different media reports have different influences on managers' psychology, which will cause enterprise managers to make different investment decisions (Brown et al., 2009). Therefore, this paper studies the impact on enterprise overinvestment from two types of media reports.

The media's positive reports on the enterprise are often a kind of propaganda to the enterprise, and an indirect affirmation and appreciation of the ability of enterprise managers. When a manager is praised by the media or society, it will stimulate the manager's investment enthusiasm, further increase the degree of overconfidence, and make him more optimistic and positive about the investment environment and the future prospects of the project (Gao et al., 2021; Fan et al., 2022). When praised by society and news media, enterprise CEOs will be more confident, more optimistic about investment prospects and future returns, and thus make more and more aggressive investments (Brown et al., 2009). Under positive media reports, managers will further increase their overconfidence, pursue larger-scale expansion driven by higher interests, and are more likely to make irrational decisions that lead to overinvestment (Popa and Nedelea, 2022). Therefore, positive media reports cannot negatively regulate overinvestment caused by overconfidence, but rather aggravate overinvestment caused by managers' overconfidence.

In addition, positive reports and publicity may form an "investment bubble" in the stock market, leading to rising stock prices and overvaluation of companies. In such a situation, the media makes enterprise financing more convenient through free and powerful publicity, and has ample cash flow (Wang, 2017; Tijani et al., 2021). At this time, managers will make more investment and lead to overinvestment. Moreover, when the media reports too much positively on the enterprise, the reputation mechanism will reduce the supervision of the enterprise by external stakeholders, relax the risk warning of the enterprise, and reduce the constraints and supervision of the investment behavior of the enterprise (Bai et al., 2019). As a result, managers lack reasonable and rational evaluation and consideration when making investment decisions, resulting in overinvestment of enterprises. To sum up, this paper proposes the hypothesis H2a:

> Hypothesis H2a: Positive media reports can exacerbate overinvestment caused by managers' overconfidence.

On the contrary, the negative reports of the media will generally affect the investment behavior of enterprises from three aspects. First, compared with positive media reports, negative reports are generally more well-founded and more credible. Therefore, negative reports usually have greater influence, and the market reaction caused by negative reports will be correspondingly stronger. Compared with positive reports, negative media reports can play a more important role in public opinion and supervision (Jin and Qin, 2021). Erena et al. (2022) and other studies found that the media reports and exposure of negative enterprise news will lead to a substantial decline in enterprise stock prices, affecting enterprise reputation and rating, and leading to a decline in enterprise investment capabilities (Li et al., 2018). Wang et al. (2022) deeply studied the relationship between enterprise performance and market response, and found that negative media reports can trigger a larger market response, thus playing the role of enterprise governance (Han et al., 2021). Second, negative media reports will draw widespread public attention. Especially under the trend of rapid development of mass media in recent years, negative reports will cause certain pressure on public opinion, which will lead to the high attention and key supervision of administrative and regulatory departments (Kottimukkalur, 2018). This gives enterprises stronger supervision, and it is easier, more accurate and timely to detect irrational behaviors and irregularities of enterprises. Under such pressure, negative media reports can improve social supervision, reduce overinvestment by enterprises, and achieve the purpose of enterprise governance. Third, media reports can have a significant impact on managers' psychology. Negative press can damage a manager's image and reputation. In order to restore their own image and enterprise reputation, managers will try their best to establish a positive image, invest in strict accordance with shareholders' wishes and rational investment principles, reduce excessive investment behavior, and improve enterprise investment efficiency. On the other hand, the negative media reports on enterprises will undoubtedly cause a certain blow to managers' psychology. The specific performance is that managers are more cautious when analyzing investment decisions, and will more objectively judge the value and risks of investment projects to avoid investment failures (Krulicky and Horak, 2021; Lu, 2022).

In addition, media reports of negative enterprise news will attract the attention and stricter supervision of both public investors and regulatory authorities in society. Such public opinion pressure will have a great negative impact on the career and future development of managers. Rossi et al. (2021) found that the supervision of the media has a strong binding force on managers, which will seriously affect the reputation and image of managers. Under the influence of the media, managers can effectively reduce the violations of managers' self-interest trends. Rahayu et al. (2022) concluded that negative media reports will inhibit managers' desire to satisfy their interests and play a role in enterprise governance. In summary, this paper proposes the following hypothesis H2b:

> Hypothesis H2b: Negative media reports can inhibit overinvestment caused by managers' overconfidence.

Moderating effect of media reports under different marketization processes

China is currently under the institutional background of social market economic transformation with Chinese characteristics, which is a critical period of economic transformation. However, due to China's vast territory and numerous provinces, the marketization process of each

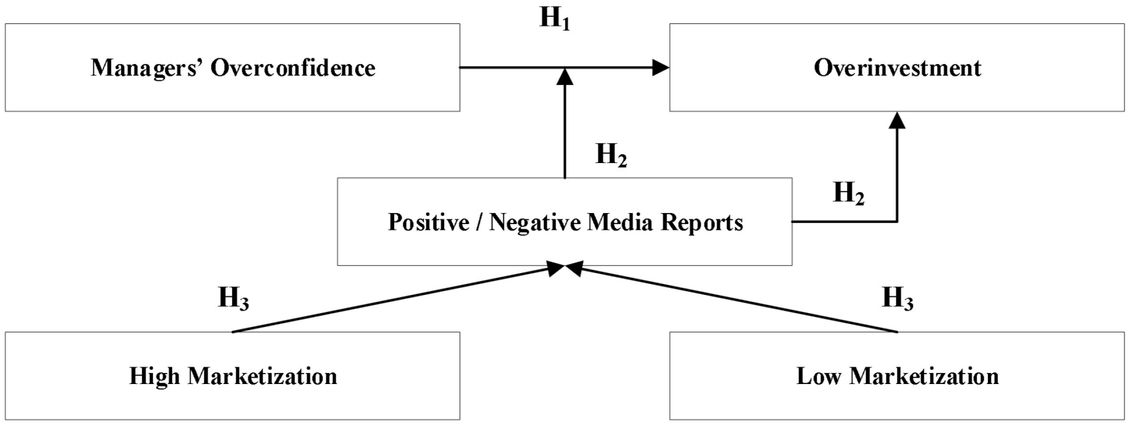

FIGURE 2
Research hypothesis relationship diagram.

province and region is quite different (Durana et al., 2021). The marketization processes is a concentrated manifestation of the comprehensive environment of a region, which affects the activities and behaviors of different players in the market, and virtually supervises and restrains all players in the market (Kunjal et al., 2021; Akbar et al., 2022). As an important manifestation of the macro environment, the marketization processes will not only affect the governance role of the media, but also affect the behavior and decision-making of managers, thereby affecting the investment efficiency of enterprises (Kottimukkalur, 2018).

Positive media reports are not only difficult to achieve the role of enterprise governance, but also cannot suppress overinvestment caused by managers' overconfidence, but will further aggravate managers' overconfidence, which is more likely to lead to companies' overinvestment. In areas where the marketization process is high, the market order and social system are relatively more complete, the degree of information asymmetry is lower, the mutual flow of information is more convenient, and the market is more transparent. The competition in the capital market is more intense, and there are more choices and opportunities for investors to invest in Rossi et al. (2021). The managers of enterprises will have higher pursuit and more urgent desire for promotion and reputation. At this time, the positive reports of the media will further expand, aggravate the overconfidence of managers, enhance the optimism of managers, stimulate managers to trigger their more enthusiastic investment enthusiasm, and then more easily lead managers to make excessive investment decision (Marjohan, 2021; Fan et al., 2022). In areas where the marketization process is low, investment opportunities are relatively limited, information asymmetry is high, market competition is not so intense, and the overall investment atmosphere and enthusiasm in the market are relatively low, and it is not easy to generate investment bubbles and follow-up investment. The aggravation of managers' overconfidence by positive media reports is not very significant, and there may be a certain degree of lag (Suryani et al., 2021). Therefore, in an environment with a low degree of marketization, the impact of positive media reports on the degree of overconfidence of enterprise managers will be much smaller than that in areas with a high marketization process, and the aggravating effect of overinvestment caused by overconfidence is not as significant as that in areas with high marketization. In summary, this paper proposes the hypothesis H3a:

> Hypothesis H3a: In regions with high marketization, positive media reports has a more pronounced effect on the relationship between managers' overconfidence and overinvestment.

For negative media reports, it can play a positive role to improve enterprise governance. However, the marketization process itself can play a certain positive and governance role, which is a good supplement to the external governance and supervision mechanism. Lyan et al. (2021) concluded through research that there is no complementary role between the media and the marketization process, but an alternative relationship. In this society that is undergoing a market-oriented economic transition, in areas where the marketization process is high, the influence of the media will be weakened accordingly. That is to say, in areas with a low degree of marketization, the media, as a supplement of a governance mechanism, can make up for the insufficiency of the marketization process (Richardson, 2006). In regions with a high degree of marketization, the governance role of media reports will be weakened (Wang, 2017).

In areas where the process of marketization is relatively high, information transmission is relatively smooth, and the degree of information asymmetry is low. The information among all parties in the market is relatively transparent, and both managers and investors have multiple ways and means to obtain information and make decisions. Elberry and Hussainey (2020) also believes that in regions with high marketization, information flows smoothly between enterprises and external investors, and legal protection, competition mechanisms and other mechanisms can effectively reduce information asymmetry between the two parties. In addition, due to the relatively complete institutional norms and competition supervision mechanisms in the highly market-oriented regions, overconfidence prevails. Negative media reports have little effect on it, and it is difficult to suppress the excessive investment behavior caused by managers' overconfidence (Shi et al., 2020; Miao, 2022). At this time, the role of media reports in enterprise governance was limited. In regions with a low level of marketization, the market capacity and capital are very limited, there are not many opportunities and choices in the market, and the competition and institutional mechanisms in the market are not perfect. Enterprise managers and external investors have limited access to information, and the cost is relatively high (Akbar et al., 2021). Moreover, the market supervision mechanism is not perfect, and the supervision of enterprises is not in place. In such an environment, negative media reports have a relatively large impact on society, greatly weakening managers' self-confidence and investment enthusiasm, and in order to maintain their own reputation, it will reduce irrational decision-making and reduce excessive investment. At this time, the negative media reports will have a greater impact on enterprises and society, but can better play the role of enterprise governance (Ali et al., 2022; Yeoh and Hooy, 2022). To sum up, this paper proposes the hypothesis H3b:

> Hypothesis H3b: Negative media reports have a stronger inhibitory effect on the relationship between managers' overconfidence and overinvestment in regions with lower marketization.

The relationship structure between the research hypotheses in this paper is shown in **Figure 2**.

Research design

Data sources

This paper selects all A-share listed companies in China from 2013 to 2021 as the research object, and based on this, the samples are screened as follows: (1) The financial data of listed companies in industries such as finance and insurance fluctuates greatly, which will affect the research hypotheses of this paper, so industry samples such as finance and insurance are excluded. (2) The lack and abnormality of relevant data of the enterprise will make it impossible to reflect the real situation of the enterprise normally, so the samples with missing data and abnormal financial data are excluded. (3) There is a certain suspicion of fraud in the relevant data of ST company, so the sample of listed companies that were ST was excluded during the research period. In addition, in order to alleviate the influence of extreme values in the sample on the empirical results, the Winsorize extreme value adjustment is performed on the sample at the 1 and 99% levels to eliminate the influence of extreme values on this study. Through elimination and screening, the balanced panel data of 6,012 companies are finally obtained as research samples. Likewise, the methodology of this study allows the study to be replicated in numerous countries such as the United States or Europe.

The variable data used in this article are mainly from the China Stock Market and Accounting Research Database (CSMAR) and China National Knowledge Infrastructure (CNKI): (1) The media reports data is obtained through the subject search of the full name and abbreviation of the listed company by the eight major newspapers and magazines in the "Full-text Database of Important Chinese Newspapers" of CNKI with the help of Python software. (2) Data on other variables are mainly collected through the CSMAR database. All data were processed and empirically analyzed using STATA15.0 software.

Variable selection

Predicted variables

Richardson (2006) is currently the most widely used and effective model for measuring investment efficiency. The principle of the model is: under the premise of considering the factors that affect the investment amount, the difference between the expected and actual investment amount of the enterprise is used to represent the investment efficiency of the enterprise. This model cannot only conveniently distinguish inefficient investment, but also measure the intensity of inefficient investment, and does not need to rely on the Tobin Q value of enterprises, and it is also applicable in Chinese's capital market. Based on this, this paper uses the Richardson (2006) model to measure overinvestment. This paper calculates the company's investment efficiency to measure the company's overinvestment. The residual ε_{it} is used to represent the inefficient investment of the enterprise, and only the samples with the residual ε_{it} greater than 0 are retained.

$$\begin{aligned} Invest_{it} = \alpha_0 + \alpha_1 Growth_{i,t-1} + \alpha_2 Lev_{i,t-1} + \alpha_3 Cash_{i,t-1} \\ + \alpha_4 Age_{i,t-1} + \alpha_5 Size_{i,t-1} + \alpha_6 Ret_{i,t-1} \\ + \alpha_7 Invest_{i,t-1} + \sum Industry + \sum Year + \varepsilon_{it} \end{aligned}$$

Explanatory variables

This paper argues that the use of personal background characteristics to measure managers' overconfidence is a relative value. Methods are more rational, personal characteristics are more objective, and uncertainty and subjectivity are avoided.

Therefore, this paper uses gender, dual-job integration, age and educational background to construct a comprehensive indicator to measure managers' overconfidence:

Sexsorce

Byrnes et al. (1999) found that compared with women, men are more radical, they are too firm in their own judgments and choices, and it is difficult to listen to others' opinions, and there is a more serious overconfidence mentality. Clifton and Gill (1994) specifically studied the influence of gender on self-confidence psychology. The results showed that women were far less confident than men, and women were more conservative and underestimated their abilities.

Agescore

With the growth of age, people's knowledge and experience will become more and more rich, and their decisions will generally become more mature and rational. Lyan et al. (2021) found that, after experiencing some failures, older managers will learn from experience and continuously improve their judgment and decision-making ability, thereby reducing their overconfidence and irrational mentality. Especially in investment projects, they are more cautious and prudent in order to avoid risks, and their degree of overconfidence is much lower than that of younger managers (Greene, 2006). Therefore, the text argues that managers with younger age indicators are more prone to overconfidence and have higher levels. In this paper, the age indicator is defined as the ratio of the difference between the maximum and observed age in all samples to the difference between the maximum and minimum values in all samples. The higher the score, the higher the degree of overconfidence.

$$agescore = \frac{\max(age) - age}{\max(age) - \min(age)}$$

Degreescore

People with higher education have the capital to think they have higher ability and richer investment experience. The research of Schrand and Zechman (2011) shows that the higher the education level, the more confident you will be, who think you have a higher ability, tend to overestimate your true level, and firmly believe that your judgment and choice are correct. Therefore, this paper believes that managers with higher education are prone to overconfidence. The higher the education, the stronger the sense of superiority and the higher the degree of overconfidence. Therefore, when the manager has a bachelor's degree or above, the education index takes the value of 1, otherwise it is 0.

Posiscore

Posiscore refers to a manager being awarded two key positions at the same time by a company. People with dual positions and high positions are more confident, further exacerbating the level of managers' overconfidence. Managers see this as an affirmation and appreciation of their own abilities, which further increases their confidence in decision-making (Schrand and Zechman, 2011). Therefore, this paper believes that if a manager holds two positions, it will be more prone to overconfidence, that is, if the manager has two positions, the indicator takes a value of 1, otherwise it is 0.

Overconfidence (***OC***): The degree of managers' overconfidence is comprehensively measured and reflected by personal characteristics. This paper sums up the above four personal characteristics to their arithmetic average, and uses the final score as a measure of managers' overconfidence.

$$OC = \frac{sexscore + agescore + degreescore + posiscore}{4}$$

Moderating variables

Media

At this stage, the media mainly include newspapers and magazines, online media and self-media. Compared with newspapers and magazines, online media and self-media are greatly affected by other factors, and the voices are complex and changeable, their objectivity and credibility are low, and their credibility is not as good as that of newspapers. On the other hand, it is difficult to obtain and collect information on online media and self-media, and it is difficult to do a comprehensive arrangement. Therefore, this paper selects the number of newspapers, magazines and self-media reports on enterprises as the measure of media reports.

This paper selects the eight most authoritative and influential mainstream financial newspapers in China as the source of media reports. The eight newspapers are "China Securities Journal," "Securities Times," "Shanghai Securities News," "Securities Daily," "China Business News," "twenty-first Century Business Herald," "First Financial Daily" and "Economic Observer." The reason for choosing these eight newspapers is that the first four newspapers are official media specially and strictly stipulated by the China Securities Regulatory Commission, and they are policy-oriented media with sufficient authority. The last four newspapers are relatively authoritative media organizations in Chinese's securities industry and even in the entire market, with very large market influence and circulation. Therefore, choosing these eight newspapers as the source of media reports has sufficient authority and persuasion.

This paper measures media reports by the natural logarithm of "1 ++++ the number of media reports", defined as *Media*. In order to further study the different influences and roles of positive and negative media reports, media reports need to be divided into positive and negative reports according to their content. Since there is no uniform and standard division on how to divide positive and negative reports, this paper distinguishes positive media reports (P_{Media}) and negative media reports (N_{Media}) according to the content of the report by reading each report and according to the emotional color. When statements such as "tax evasion, shady, illegal, corrupt, fraud" appear in the report, it is a negative report. When statements such as "optimize, improve, perfect" appear in the report, it is a positive report. In order to prevent endogeneity, the data reported by the media in this paper is measured by the number of media reports with a lag period of one period, that is, period t-1. The specific measurement methods of media reports variables are as follows:

$$P_{Media} = \ln(1 + Number\ of\ positive\ media\ reports)$$
$$N_{Media} = \ln(1 + Number\ of\ negative\ media\ reports)$$

Control variables

(1) Enterprise age (*Age*)

Age represents the age of the company's listing. The shorter the company's listing period, the less perfect the internal governance mechanism, and the more likely it is that irrational behaviors such as overinvestment will occur.

(2) Growth ability (*Growth*)

The higher the growth ability (*Growth*) of the enterprise, the more funds it accumulates and the more investment opportunities, the more capital and opportunities for overconfident managers to use sufficient free cash flow to invest, and thus more prone to overinvestment behavior. This paper uses the "main business income growth rate" to measure the growth ability of enterprises.

(3) Marketization process (*Market*)

Market is a process of economic transition, involving a series of social, institutional, economic, political and other transformations, and it is difficult to measure it with a single indicator. This paper deeply explores the characteristics of China's marketization process, and constructs a comprehensive index through principal component analysis, namely, the marketization process index. The marketization process index can generally reflect the degree of marketization and differences in various provinces and regions, and is currently the most reasonable and perfect method to measure China's marketization process. The higher the regional marketization index, the faster the marketization process in the region, the higher the marketization level, the more perfect the laws and competition mechanisms, and the less government administrative intervention. This paper sets "*Market*" as a dummy variable. When the marketization process index in the region is higher than the average index, the value is 1, otherwise it is 0.

(4) Equity concentration (*Top* 1)

Top 1 is the ratio of the number of shares held by the largest shareholder to the total number of shares. The greater the voice of the largest shareholder, the stronger the control over decision-making, the more likely it is to check and balance the irrational behavior of managers, thereby reducing the excessive investment of enterprises. However, when the largest shareholder also has overconfidence, it may further exacerbate the company's overinvestment. This paper uses "the ratio of the number of shares held by the largest shareholder to the number of all ordinary shares" to measure the ownership concentration.

(5) Enterprise size (*Size*)

The size of the enterprise is the embodiment of the comprehensive strength of the enterprise. In general, the larger the enterprise scale, the more investment opportunities the enterprise has, and the managers have a stronger sense of superiority and more overconfidence, believing that the enterprise is strong enough to withstand any risks. In this paper, the natural logarithm of "total assets" is used to measure the size of the enterprise.

(6) Return on Equity (*Roe*)

The higher the *Roe* of an enterprise, the better the overall vitality of the enterprise and the better the operating income. Managers will also have a more optimistic attitude toward the development prospects of the company, and will be more prone to overinvestment. This paper uses the ratio of net profit to average shareholders' equity of the enterprise to measure.

(7) *Industry*

Industry is a dummy variable that controls the influence of different industry factors. The media's attention and reports of different industries are different, so the number of media reports of companies in different industries is also quite different. This paper divides the sample enterprises into 18 industries, so this paper sets 17 industry dummy variables.

(8) Annual (*Year*)

Year is a dummy variable to control the influence of different year factors. The number of times the media reports on companies varies in different years. This paper takes the listed companies from 2013 to 2021 as a sample, with a total of 9 years of data, so a total of 8 annual dummy variables are set.

In summary, the selection and definitions of all variables in this paper are shown in **Table 1**.

Model design

This study uses China's 2013–2021 A-share listed companies in Shanghai and Shenzhen as a sample to explore the relationship between managers' overconfidence, positive and negative media reports, and overinvestment. In order to verify the hypotheses of this paper, the following regression equation is established to test the relevant hypotheses proposed in this paper.

Research on the impact of managers' overconfidence on enterprise overinvestment:

$$Overinvit = \beta_0 + \beta_1 OC_{it} + \sum \gamma_i Controls + \varepsilon_{it}$$

To study the moderating effect of positive and negative media reports on managers' overconfidence and enterprise

TABLE 1 Variable definition table.

Type	Name	Symbol	Definition
Predicted variables	Overinvestment	***Overinv***	Calculated using the Richardson model
Explanatory variables	Managers' overconfidence	***OC***	Arithmetic mean of managers' personal characteristics
Moderating variables	Positive media reports	P_{Media}	ln(1+Number of positive media reports)
	Negative media reports	N_{Media}	ln(1+Number of negative media reports)
Control variables	Equity concentration	***Top* 1**	Shareholding ratio of the largest shareholder
	Enterprise age	***Age***	The company's listing period
	Return on equity	***Roe***	Net profit/Average Shareholders' equity
	Enterprise growth	***Growth***	Growth rate of current operating income
	Enterprise size	***Size***	The natural logarithm of the company's total assets
	Marketization	***Market***	Marketization index of each province. 1 for above average, 0 otherwise.
	Industry	***Industry***	The sample involves 18 industries and 17 dummy variables are set
	Year	***Year***	The sample involves 9 years, and 8 dummy variables are set

TABLE 2 Descriptive statistics.

Variable name	*Mean*	*Std.*	*Min*	*Max*
Overinv	0.058	0.076	0.0004	0.42
OC	0.659	0.151	0.026	0.996
P_{Media}	1.058	0.949	0	6.103
N_{Media}	1.050	0.977	0	6.304
***Top* 1**	0.339	0.145	0.0880	0.75
Growth	0.442	1.279	−0.723	2.018
Size	22.430	1.246	19.66	26.06
Age	17.810	5.707	4	31
Roe	0.063	0.122	−0.819	0.313
Market	0.568	0.495	0	1

overinvestment relationship and the heterogeneity analysis of marketization process:

$$Overinvit = \beta_0 + \beta_1 OC_{it} + \beta_2 OC \times P_{Media} + \beta_3 P_{Media} + \sum \gamma_i Controls + \varepsilon_{it}$$
$$Overinvit = \beta_0 + \beta_1 OC_{it} + \beta_2 OC \times N_{Media} + \beta_3 N_{Media} + \sum \gamma_i Controls + \varepsilon_{it}$$

Empirical test and result analysis

Descriptive statistics

This paper collects and organizes the data of all A-share listed companies from 2013 to 2021. After excluding unqualified samples, a total of 6,012 observations are obtained. In order to reduce the influence of abnormal values on the results, the data were processed with 1% unilateral or bilateral Winsorize. The descriptive statistical results are shown in Table 2.

From the descriptive statistical results in Table 2, the *Mean* of *Overinv* is 0.058, the *Std.* is 0.076, the *Max* is 0.42, and the *Min* is 0.0004. The phenomenon of overinvestment is common, but there are certain differences in its degree; the *Max* is much higher than *Mean*, that is, the current degree of overinvestment of listed companies is relatively serious.

The *Mean* of the *OC* is 0.659, indicating that 65.9% of the enterprise managers in the research sample enterprises are overconfident. The *Max* of overconfidence is 0.996, the *Min* is 0.026, and the *Std.* is 0.151, which indicates that the severity of overconfidence among different managers is quite different.

The *Mean* of P_{Media} is 1.058, the *Max* is 6.103, and the *Min* is 0, indicating that the positive media reports of enterprises varies greatly. Some companies have been positively promoted by the media many times, while some companies have never been positively reported by the media. The *Mean* of N_{Media} is 1.050, the *Max* is 6.304, and the *Min* is 0, indicating that there are also great differences in the negative media reports of enterprises. Some companies have no negative reports, while others are frequently negatively reported by the media.

The *Mean* of *Top* 1 is 0.339, the *Max* is 0.75, and the *Min* is 0.0880, indicating that the difference in *Top* 1 between different companies is very significant. The *Mean* of *Growth* is 0.442, the *Max* is 9.018, the *Min* is -0.723, and the *Std.* is 1.279, indicating that the sample covers enterprises with various growth ability levels and has a wide range. The *Mean* of *Size* is 22.43, the *Max* is 26.06, and the *Min* is 19.66. The *Mean* of *Age* is 17.81. The longest listed company is 31 years, and the shortest is 4 years. It is more meaningful to study the behavior of companies with longer listing years. The *Max* of the *Roe* of the enterprise is 0.313, the *Min* is -0.819, and the *Mean* is 0.063, indicating that the income of the sample enterprises is quite different. The *Market* is used as a dummy variable with a mean value of 0.568.

Correlation analysis

Before the regression analysis, this paper uses the Pearson coefficient test to analyze the correlation of each variable, and preliminarily judges whether there is a correlation between

TABLE 3 Correlation coefficient test table.

Variables	*Overinv*	*OC*	P_{Media}	N_{Media}	*Top* 1	*Growth*	*Size*	*Age*	*Roe*	*Market*
Overinv	1.000									
OC	0.050***	1.000								
P_{Media}	0.046***	−0.006	1.000							
N_{Media}	−0.023**	−0.013	0.737***	1.000						
***Top* 1**	−0.011	−0.029**	0.078***	0.081***	1.000					
Growth	0.085***	0.014	0.024**	0.034***	0.033***	1.000				
Size	−0.052***	−0.062***	0.350***	0.334***	0.180***	0.049***	1.000			
Age	−0.106***	−0.094***	−0.117***	−0.071***	−0.085***	0.084***	0.221***	1.000		
Roe	0.067***	−0.027**	0.134***	0.065***	0.129***	0.047***	0.114***	−0.045***	1.000	
Market	−0.003	0.080***	−0.097***	−0.091***	0.034***	0.016	−0.018*	−0.020*	0.015	1.000

***$p<0.01$, **$p<0.05$, *$p<0.1$.

overconfidence and overinvestment, positive and negative media reports and overinvestment. The results are shown in Table 3.

From the results in Table 3, it can be concluded that the relationship between *OC* and *Overinv* is significantly positive at the 1% level. That is, managers' overconfidence will lead to overinvestment, which is consistent with the previous hypothesis H1. The relationship between P_{Media} and *Overinv* is significantly positive at the 1% level, and positive media reports will aggravate enterprise overinvestment. The relationship between N_{Media} and *Overinv* is significantly negative at the 5% level. It shows that the negative media reports can negatively regulate the excessive investment of enterprises, improve enterprise governance to a certain extent, and play a role in raising the level of investment. The results are in line with the previous hypotheses of H2a and H2b.

Top 1 is negatively correlated with overinvestment, but not significant. The higher the shareholding ratio of the largest shareholder, can reduce its irrational behavior to a certain extent and reduce the excessive investment of enterprises, but there is no completely significant correlation between these two variables. The *Growth* and overinvestment are significantly positively correlated at the level of 1%, that is, the stronger the *Growth*, the more capital there is for investment activities. *Size* and overinvestment are significantly negatively correlated at the 1% level. The larger the *Size*, the more comprehensive the assessment will be carried out before the investment for risk management and control, so as to alleviate overinvestment. *Age* is significantly negatively correlated with overinvestment at the 1% level. The longer the *Age*, the more inclined the company will be to stabilize its market position and consolidate its market share, prefer the strategy of seeking progress while maintaining stability, and be less likely to overinvestment. *Roe* is positively related to overinvestment, but not significantly. Higher enterprise performance and fewer financing constraints may encourage managers to overinvestment with ample cash flow.

TABLE 4 Regression results of managers' overconfidence on overinvestment.

Variables	Coefficient	*T*-value	VIF
OC	0.0179***	2.8125	1.258
***Top* 1**	−0.0010**	−0.1418	1.024
Growth	0.0078***	8.9484	1.172
Size	−0.0004	−0.4089	1.023
Age	−0.0007***	−3.7375	1.087
Roe	0.0389***	4.5271	1.402
Market	0.0020*	0.9479	1.128
Industry		Control	
Year		Control	
Constant term	0.0345	1.3260	
F-value		4.5	
Sig.		0.0000***	
Durbin-Watson		1.7325	
Number of samples		6,012	
Adj.R^2		0.271	

***$p<0.01$, **$p<0.05$, *$p<0.1$, the same below.

From the results of the correlation test data, the relationship between the variables studied in this paper is basically in line with the expected expectations. This paper will further analyze and test all the hypotheses in depth in the empirical testing section.

Multiple regression analysis

This paper divides the sample into three sections for research. The first section tests Hypothesis H1 and studies the effect of managers' overconfidence on overinvestment. Section "Literature review" verifies hypotheses H2a and H2b, introduces media reports as a moderating variable, and studies whether positive or negative media reports has moderating effects on managers' overconfidence-induced overinvestment. Section

"Research hypothesis" verifies hypotheses H3a and H3b, and studies the moderating effect of media reports under different marketization processes.

Impact of managers' overconfidence on enterprise overinvestment

In this paper, the regression results of hypothesis H1 through empirical testing are shown in Table 4. In the regression process, industry and year were controlled.

Goodness of fit, F-test, VIF test analysis

According to Table 4, the *Adj.*R^2 is 0.271, indicating that all explanatory variables in the model explain 27.10% of the *Overinv* of the predicted variable, and the model has a good goodness of fit. The *F-value* is 4.5 and the *Sig.* is 0.0000, indicating that the model is statistically significant. The VIF of all variables did not exceed 2, indicating that there was no multicollinearity among the variables. The *Durbin-Watson* is 1.7325, which is small, indicating that the random error term does not have autocorrelation.

Significant analysis

It can be seen from Table 4 that *OC* and *Overinv* have a significant positive correlation at the 1% confidence level. Looking at the control variables, *Growth* and *Roe* are significantly positively correlated with *Overinv*, and *Age* is significantly negatively correlated with *Overinv*.

Analysis of test results

From Table 4, it can be concluded that the regression coefficient of (*OC* and *Overinv* is 0.0170, which is significantly positive at the 1% level, indicating that managers' overconfidence will directly lead to overinvestment of enterprises. When managers are overconfident, they have a strong sense of superiority, trust their own judgments too much, are optimistic about the future rate of return of the project, and have difficulty listening to the opinions of others. Driven by their own promotion and interests, managers will prefer to invest in expansion, easily choose non-quality projects, make excessive investment, and weaken the value of the enterprise. Through the above test and analysis, it can be concluded that there is a positive correlation between managers' overconfidence and overinvestment, which verifies the establishment of hypothesis H1: managers' overconfidence will lead to overinvestment.

In terms of control variables, the regression coefficient between Top 1 and overinvestment is -0.001, but it is not significant. It shows that the higher the shareholding of the largest shareholder, it is only possible to supervise and balance the managers and reduce excessive investment, but it cannot realize the role of enterprise governance. The regression coefficient between the *Growth* and overinvestment is 0.0078, which is significantly correlated at the 1% confidence interval. It shows that the higher the growth ability of the company, the faster the growth of the company's operating income and the better the performance, which will prompt the company to use sufficient cash flow for investment, thereby increasing the possibility of the company's overinvestment. The regression coefficient between *Size* and overinvestment is -0.0004, but not significant. It shows that the larger the size of the enterprise, it may reduce the overinvestment of the enterprise, but the size of the enterprise does not have a direct and significant impact on whether the enterprise is overinvested. The regression coefficient between *Age* and overinvestment is -0.0007, and there is a significant correlation within the 1% confidence interval. It shows that the younger the enterprise is, the more immature and imperfect the relevant internal regulatory checks and balances are, and the enterprise is in the growth stage and prefers to expand, the more likely it is to make over-investment. On the contrary, the longer the company has been listed, the more conservative and stable the enterprise strategy will be, and there will be less overinvestment. The regression coefficient between *Roe* and overinvestment is 0.0389 and is significantly correlated within the 1% confidence interval. When the ratio between enterprise net profit and shareholders' equity increases by 1 percentage point, enterprise overinvestment will increase by 0.0389 percentage points. That is, the better the performance of the enterprise, the more likely it will lead to further overinvestment of the enterprise.

Moderating effect of media reports on managers' overconfidence and overinvestment

This section further explores how media reports influence and moderate the overinvestment behaviors of companies caused by managers' overconfidence under different emotional colors. The regression results are shown in Table 5.

Goodness of fit, F-test, VIF test analysis

Regarding the regression of the moderating effect of positive media reports, as shown in Table 5, the *Adj.*R^2 was 0.209. It shows that the variable in the model explains the *Overinv* of the predicted variable is 20.90%, which has a good goodness of fit. The *F-value* is 17.89 and the *Sig.* is 0.0000, indicating that the model has significant statistical significance. The VIFs of all variables were around 1.0, indicating that there was no multicollinearity among the variables. The *Durbin-Watson* is 1.2376, indicating that there is no autocorrelation in the random error term.

Regarding the regression of negative media reports and overinvestment, according to Table 5, the *Adj.*R^2 is 0.194. It shows that the variables in the model explain the degree of *Overinv* of the predicted variable is 19.4%, which has a good goodness of fit. The *F-value* was 9.84 and the *Sig.* was 0.0000, indicating that the model was statistically significant. The VIFs of all variables were around 1.0, indicating that there was no multicollinearity among the variables. The *Durbin-Watson* is

TABLE 5 Regression results of the moderating effect of positive and negative media reports.

Variables	Coefficient	*T*-value	VIF	Coefficient	*T*-value	VIF
OC	0.0133***	−1.5475	1.0315	0.0369***	4.8131	1.0296
P_{Media}	−0.0186***	−4.4936	1.2416			
$P_{Media} \times OC$	0.0354***	5.3893	1.3872			
N_{Media}				0.0101***	3.0776	1.0243
$N_{Media} \times OC$				−0.0244***	−4.3273	1.1378
***Top* 1**	0.0007	0.0965	1.0582	−0.003	−0.4251	1.0582
Growth	0.0078***	8.9947	1.3736	0.0078***	9.0122	1.3736
Sise	−0.0012	−1.1716	1.0583	0.0006	0.6345	1.0583
Age	−0.0007***	−3.6443	1.1254	−0.0007***	−3.7318	1.1254
Roe	0.0373***	4.3308	1.3127	0.0393***	4.5786	1.3127
Market	0.0040*	1.8852	1.4139	0.0002	0.0757	1.4139
Industry		Control			Control	
Year		Control			Control	
Constant term	0.0668**	2.4479		0.0108	0.4002	
F-value		17.89			9.84	
Sig.		0.0000***			0.0000***	
Durbin-Watson		1.2376			1.8356	
Number of samples		6,012			6,012	
***Adj.*R^2**		0.209			0.194	

***$p<0.01$, **$p<0.05$, *$p<0.1$.

1.8356, indicating that there is no autocorrelation in the random error term.

Significant analysis

From Table 5, it can be seen that the media positive reporting interaction term ($P_{Media} \times OC$) and overinvestment are significantly positive at the 1% confidence level. The *Growth*, *Roe* and *Market* have a significant positive correlation with overinvestment. *Age* has a significant negative correlation with overinvestment. The relationship between *Size* and *Top* 1 and *Overinv* is not significant. While the negative media reports interaction term ($N_{Media} \times OC$) and overinvestment are significantly negative at the 1% confidence level, the regression results for the control variable and overinvestment are similar to the previous regression results.

Analysis of test results

From the results in Table 5, it can be seen that the regression coefficient between the positive media reports item ($P_{Media} \times OC$) and the *Overinv* is 0.0354, and there is a significant positive correlation at the 1% confidence level. The regression coefficient between the negative media reports item ($N_{Media} \times OC$) and the *Overinv* is −0.0244, which is significantly negatively correlated at the 1% level. The above results show that positive media reports will aggravate managers' overconfidence, which will make enterprise managers optimistic about the future returns and prospects of investment projects, ignoring investment projects and market risks, and further lead to excessive investment behavior. The negative reports and exposure of the media to the enterprise will cause a certain blow to the managers, reduce their overconfidence psychology, and also have a certain impact on the reputation and image of the enterprise. For the sake of their own development and enterprise image, managers will be more cautious and prudent in investment, and evaluate the risks of investment projects more comprehensively and accurately. Managers prove to investors the ability of managers and the good prospects of enterprises through correct investment behaviors and performance, thereby reducing the excessive investment behaviors of enterprises caused by managers' overconfidence, and effectively realizing enterprise governance. The above analysis verifies the hypothesis H2a and H2b, respectively.

Moderating effect of media reports under different marketization processes

At present, China is in the critical stage of market-oriented economic transformation. Different market-oriented processes have different impacts on the development of enterprises. In addition to Chinese's unique national conditions, the level of regional marketization varies greatly. Under different economic and legal environments, media reports play different roles. In order to more accurately analyze how media reports affect the overinvestment caused by managers' overconfidence under different marketization processes. This paper divides the samples into high and low groups according to the marketization process, and divides the sample enterprises into high marketization and low marketization for analysis.

TABLE 6 Regression results of positive media reports under different marketization processes.

	Low marketization			High marketization		
Variables	**Coefficient**	***T*-value**	**VIF**	**Coefficient**	***T*-value**	**VIF**
OC	0.0120***	0.8437	1.3178	0.0331***	−3.0226	1.1472
P_{Media}	0.0015***	0.2422	1.2012	−0.0400***	−6.8745	1.9134
$P_{Media} \times OC$	0.0005	−0.0485	1.7213	0.0691***	7.8372	1.1165
***Top* 1**	0.0028	0.260	1.3421	0.0016	0.1708	1.2465
Growth	0.0107***	7.7314	1.2984	0.0063***	5.5924	1.2312
Sise	0.0012	0.7457	1.6597	−0.0024*	−1.7952	1.0312
Age	−0.0007**	−2.0448	1.2165	−0.0008***	−3.2662	1.1432
Roe	0.0502***	3.7756	1.0159	0.0308***	2.6748	1.2169
Industry		Control			Control	
Year		Control			Control	
Constant term	−0.0061	−0.1616		0.1291*	1.6644	
F-value		22.34			18.02	
Sig.		0.0000***			0.0000***	
Durbin-Watson		1.2578			1.1895	
Number of samples		2,534			3,478	
$Adj.R^2$		0.216			0.190	

***$p<0.01$, **$p<0.05$, *$p<0.1$.

First, study the moderating effect of media positive reports on overconfidence and overinvestment under different marketization processes. The regression results are shown in Table 6.

Goodness of fit, F test, VIF test analysis

According to Table 6, it can be concluded that in the sample group with a high degree of marketization, the $Adj.R^2$ after regression is 0.190, and the $Adj.R^2$ after regression in the sample group with a low degree of marketization is 0.216. It can be seen that the goodness of fit of the two sets of results is good and acceptable. The *F-values* were 18.02 and 22.34, respectively, and the *Sig.* were both 0.0000, indicating that the models were all statistically significant. None of the variables VIF exceeds 2, indicating that there is no multicollinearity among the variables. The *Durbin-Watson* are 1.1895 and 1.2578, respectively, indicating that there is no autocorrelation in the random error term.

Significant analysis

In regions with a high degree of marketization, the positive media reports item ($P_{Media} \times OC$) is significantly positively correlated with *Overinv*. *Growth*, *Roe* and *Overinv* are significantly positively correlated. *Age* has a significant negative correlation with *Overinv*. There was no significant relationship between the other control variables overinvestment.

Analysis of test results

From the data analysis in Table 6, in regions with low degree of marketization, the regression coefficient between positive media reports ($P_{Media} \times OC$) and *Overinv* is 0.0005, but it is not significant. In regions with a high degree of marketization, the regression coefficient between the positive media reports item ($P_{Media} \times OC$) and the *Overinv* is 0.0691, and it is significantly correlated at the 1% level. This shows that in regions with a high degree of marketization, market competition is more intense, investment opportunities are more numerous, managers' pursuit of self-promotion and reputation is more urgent, and utilitarian psychology is more serious. In such an environment, positive media propaganda and reports will put more emphasis on managers' overconfidence, which will lead to companies' overinvestment behavior. On the contrary, in regions with a low degree of marketization, the market competition is not fierce and the projects that can be invested are limited. At this time, the positive media reports may have a relatively weak effect on managers' psychology, or there may be a certain lag, and the impact on overinvestment caused by overconfidence is relatively small. The above results and analysis verify the above hypothesis H3a: in regions with high marketization, positive media reports have a more pronounced effect on the relationship between managers' overconfidence and overinvestment.

Table 7 shows the moderating effect of negative media reports under the heterogeneity of the marketization process.

Goodness of fit, F test, VIF test analysis

According to Table 7, it can be concluded that in the sample group with a high degree of marketization, the $Adj.R^2$ after regression is 0.270, and the $Adj.R^2$ after regression in the sample group with a low degree of marketization is 0.292. It can be seen that the goodness of fit of the two sets of results is good and acceptable. The *F-value* were 6.29 and 23.72,

TABLE 7 Regression results of negative media reports under different marketization processes.

Variables	Low marketization			High marketization		
	Coefficient	*T*-value	VIF	Coefficient	*T*-value	VIF
OC	0.0786***	5.7165	1.0125	0.0255***	2.6732	1.0237
N_{Media}	0.0346***	5.8111	1.0365	−0.0003	−0.0832	1.6254
$N_{Media} \times OC$	−0.0675***	−6.9055	1.3485	−0.0039	−0.5312	1.3485
Top 1	−0.0005	−0.0462	1.1765	−0.0022	−0.2401	1.0265
Growth	0.0105***	7.680	1.4954	0.0063***	5.5963	1.1396
Sise	0.0030*	1.9242	1.0397	−0.0007	−0.5349	1.0358
Age	−0.0006*	−1.928	1.0575	−0.0008***	−3.4359	1.0954
Roe	0.0513***	3.9216	1.5469	0.0329***	2.8377	1.5279
Industry		Control			Control	
Year		Control			Control	
Constant term	−0.0688*	−1.8495		0.0602	0.7712	
F-value		23.72			6.29	
Sig.		0.0000***			0.0000***	
Durbin-Watson		1.2508			1.0685	
Number of samples		2,534			3,478	
Adj.R^2		0.292			0.270	

***$p<0.01$, *$p<0.1$.

TABLE 8 Summary of variable regression results.

Hypothesis	Variable relationship		Salience	Empirical results
H1	Managers' overconfidence leads to overinvestment		Significantly positive	Hypothesis H1 holds.
H2a	Moderating effect of positive media reports		Significantly positive	Hypothesis H2a holds.
H2b	Moderating effect of negative media reports		Significantly negative	Hypothesis H2b holds.
H3a	Moderating effect of positive media reports	High marketization	Significantly positive	Hypothesis H3a holds.
		Low marketization	Not significantly	
H3b	Moderating effect of negative media reports	High marketization	Not significantly	Hypothesis H3b holds.
		Low marketization	Significantly negative	

respectively, and the *Sig* were both 0.0000, indicating that the models were all statistically significant. All variables VIF did not exceed 2, indicating that there was no multicollinearity among the variables. The *Durbin-Watson* are 1.0685 and 1.2508, respectively, indicating that there is no autocorrelation in the random error term.

Significant analysis

In regions with a high degree of marketization, the crossover term ($N_{Media} \times OC$) is negatively correlated with *Overinv*, but it is not significant. For the control variables, *Growth*, *Roe* and *Overinv* are significantly positively correlated, and *Age* is significantly negatively correlated with *Overinv*. There was no significant relationship between the other control variables overinvestment. In regions with low marketization, the crossover term ($N_{Media} \times OC$) and overinvestment (*Overinv*) are significantly negatively correlated at the 1% level. For the control variables, except that the *Age* has a significant negative correlation with the *Overinv*, the regression results of other control variables are similar to the above results, and will not be repeated here.

Analysis of test results

From the data analysis in Table 7, in low marketization regions, the regression coefficient between the negative media reports term ($N_{Media} \times OC$) and overinvestment is -0.0675, and it is significantly correlated at the 1% confidence level. In high marketization regions, the regression coefficient between the negative media reports term ($N_{Media} \times OC$) and overinvestment is -0.0039, but it is not significant. This shows that in regions with a high degree of marketization, legal, competition, and enterprise checks and balances are more complete and sound, which alleviates information asymmetry and agency costs between companies and the outside world, and the media plays a very limited role. Managers still underestimate the investment risks of projects, thereby reducing the governance

TABLE 9 Regression results of overconfidence and overinvestment.

Variables	Coefficient	*T*-value	VIF
*OC*1	0.0075***	4.3333	1.1213
Top 1	−0.0044	−0.7113	1.3912
Growth	0.0070***	10.077	1.3811
Size	−0.0004	−0.5299	1.216
Age	−0.0009**	−4.954	1.4491
Roe	0.0362**	5.1657	1.1367
Market	−0.0013	−0.6909	1.4467
Industry		Control	
Year		Control	
Constant term	0.0523**	2.4232	
F-value		10.01	
Sig.		0.0000***	
Durbin-Watson		1.4652	
Number of samples		6,012	
$Adj.R^2$		0.212	

***$p<0.01$, **$p<0.05$.

effect of negative media reports. For areas with a low degree of marketization, information is relatively blocked, various legal mechanisms in the society are not perfect, and the internal checks and balances and supervision mechanisms of enterprises are not perfect. The information asymmetry and agency conflict in the enterprise will be more serious, and the government and other administrative departments will intervene relatively more, and the negative exposure of the media will have a greater impact on the enterprise and society. Negative media reports have a strong weakening effect on managers' overconfidence, which can more effectively negatively regulate the over-investment caused by managers' overconfidence, and can play a role in enterprise governance. This further verifies the view of many scholars that "media governance and marketization are an alternative relationship, not a complementary relationship." The above results and analysis verify the above hypothesis H3b: in regions with a lower degree of marketization, negative media reports has a stronger inhibitory effect on the relationship between managers' overconfidence and overinvestment.

In order to be able to see the regression results of all hypotheses in this paper more intuitively, this paper summarizes all the empirical test results, as shown in Table 8.

Robustness check

Overconfident managers will psychologically believe that they have higher abilities and talents, which can bring more benefits to the company. Managers will have higher remuneration requirements in real enterprises, and the higher the remuneration paid to managers, the more overconfident managers will be (Luo and Ye, 2015). Therefore, this paper replaces the measure of overconfidence with relative compensation to conduct a robustness test, that is, "the sum of the top three CEO compensation" divided by "the sum of all compensation," and the ratio is compared with the sample median. If the ratio is greater than the median, it is considered that the manager is overconfident, and the overconfidence (*OC*1) value is 1 at this time, otherwise it is 0.

Expanding the scope of newspapers and magazines to reflect the comprehensiveness of media reports is also to avoid bias in selecting samples (Jiang et al., 2009). In the selection of samples, in addition to the eight authoritative media magazines, other 500 other media newspapers and periodicals in the CNKI database were further selected, including important central newspapers, financial and economic newspapers, local morning newspapers, evening newspapers, and express news. The positive and negative reports are also distinguished according to their emotional colors, and the natural logarithms are recorded as $P_{Media}2$ and $N_{Media}2$, respectively.

In this paper, the above models are re-regressed after changing the measurement methods of variables. The specific regression results are as follows.

(1) Robustness test of the impact of managers' overconfidence on enterprise overinvestment

For Hypothesis H1, the relative compensation of executives is used to replace the explanatory variables. Table 9 shows the robustness test results of Hypothesis H1.

It can be seen from the results in Table 9 that the $Adj.R^2$ is 0.212, indicating that all variables in H1 explain 21.20% of the overinvestment, and the model has a good goodness of fit. The *F-value* is 10.01 and the *Sig.* is 0.0000, which is significant at the 1% confidence level. All variables VIF did not exceed 2, indicating that there was no multicollinearity among the variables. The *Durbin-Watson* is 1.4652, indicating that there is no autocorrelation in the random error term. After replacing the measurement method of explanatory variables, the regression coefficient of managerial overconfidence (*OC*1) is significantly positive, and it is still significant at the 1% level, which is consistent with the previous regression results.

(2) Robustness test of the moderating effect of media reports on overconfidence and overinvestment

For hypotheses H2a and H2b, media reports were further introduced as moderating variables, and the interaction terms of positive and negative media reports and overconfidence were added into the models for regression, respectively. Table 10 shows the robustness test results of hypotheses H2a and H2b.

As can be seen from Table 10, for positive media reports, the $Adj.R^2$ is 0.198, indicating that the degree of overexplaining of all variables in Hypothesis 2 is 19.80%, and the goodness of fit of the model is good. The *F-value* is 8.11 and the *Sig.* is 0.0000, which is significant at the 1% confidence level. The VIF of all variables did not exceed 2, indicating that there was no multicollinearity among the variables. The *Durbin-Watson* is 1.4654, indicating that there is no autocorrelation in the random error term.

TABLE 10 Regression results of the moderating effect of positive and negative media reports.

Variables	Coefficient	*T*-value	VIF	Coefficient	*T*-value	VIF
OC1	0.0075***	3.8434	1.0213	0.0076***	3.898	1.0362
$P_{Media}2$	−0.0142***	−4.4099	1.4254			
$P_{Media}2 \times OC1$	0.0281***	5.7618	1.0618			
$N_{Media}2$				0.0024	0.8548	1.0236
$N_{Media}2 \times OC1$				−0.0097**	−2.0579	1.432
Top 1	−0.0008	−0.1139	1.0912	−0.0038	−0.5507	1.5212
Growth	0.0078***	8.9734	1.3611	0.0079***	9.0714	1.0611
Size	−0.0006	−0.6215	1.21	0.0011	1.1042	1.01
Age	−0.0007***	−3.6449	1.0491	−0.0008***	−4.1792	1.0241
Roe	0.0363***	4.2243	1.1387	0.0357***	4.3671	1.2987
Market	0.003	1.4512	1.2467	0.0011	0.5217	1.0234
Industry		Control			Control	
Year		Control			Control	
Constant term	0.0446*	1.6549	1.1469	0.0197	0.734	1.4345
F-value		0.0000***			0.0000***	
Sig.		8.11			7.76	
Durbin-Watson		1.4654			1.3462	
Number of samples		6,012			6,012	
Adj.R^2		0.198			0.243	

***$p<0.01$, **$p<0.05$, *$p<0.1$.

TABLE 11 Regression results of positive media reports under different marketizations.

Variables	Coefficient	*T*-value	VIF	Coefficient	*T*-value	VIF
OC1	0.0107***	3.5544	1.1456	0.0066***	2.5913	1.6533
$P_{Media}2$	0.0011*	−0.2503	1.3216	−0.0294***	−6.3312	1.4123
$P_{Media}2 \times OC1$	0.0044*	0.6039	1.0361	0.0523***	7.6994	1.3126
Top 1	0.0015	0.136	1.2154	−0.0002	−0.022	1.4212
Growth	0.0106***	7.7045	1.3178	0.0064***	5.5587	1.3178
Size	0.002	1.2694	1.1179	−0.0019	−1.4315	1.5123
Age	−0.0007**	−2.1396	1.4123	−0.0008***	−3.0863	1.4231
Roe	0.0479***	3.6082	1.3127	0.0307***	2.6623	1.1367
Industry		Control			Control	
Year		Control			Control	
Constant term	−0.0193	−0.5152	1.5467	0.0909	1.1733	1.3256
F-value		27.34			19.24	
Sig.		0.0000***			0.0000***	
Durbin-Watson		1.3531			1.5628	
Number of samples		2,534			3,478	
Adj.R^2		0.214			0.198	

***$p<0.01$, **$p<0.05$, *$p<0.1$.

The $Adj.R^2$ of the regression of negative media reports is 0.243, indicating that the degree of explanation of all variables in Hypothesis 2 is 24.30%, and the goodness of fit of the model is good. The *F-value* is 7.76 and the *Sig.* is 0.0000, which is significant at the 1% confidence level. The VIF of all variables did not exceed 2, indicating that there was no multicollinearity among the variables. The *Durbin-Watson* is 1.3462, indicating that there is no autocorrelation in the random error term.

After substituting the measures of overconfidence and media reports, positive reports multipliers ($P_{Media}2 \times OC1$) and *Overinv* are significantly positively correlated at the 1% level. Negative media reports ($N_{Media}2 \times OC1$) and *Overinv* are significantly negatively correlated at the 5% level. The overall results are consistent with the previous results, indicating that the results are not random, and the assumptions are robust.

TABLE 12 Regression results of negative media reports under different marketizations.

	Low marketization			High marketization		
Variables	Coefficient	*T*-value	VIF	Coefficient	*T*-value	VIF
OC1	0.0112***	3.7125	1.5213	0.0062***	2.4199	1.5362
$N_{Media}2$	0.0130***	2.8906	1.4254	−0.0047	−1.2332	1.4254
$N_{Media}2 \times OC1$	−0.0294***	−4.211	1.0295	0.005	0.7585	1.0295
Top 1	−0.0012	−0.1074	1.2912	−0.0029	−0.3148	1.5712
Growth	0.0106***	7.7119	1.3671	0.0064***	5.6402	1.0631
Sise	−0.0039**	2.4375	1.217	−0.0004	−0.2688	1.0106
Age	−0.0007**	−2.22	1.4491	−0.0009***	−3.7048	1.0341
Roe	0.0489***	3.7203	1.1397	0.0316***	2.7258	1.4987
Industry		Control			Control	
Year		Control			Control	
Constant term	−0.0438	−1.186	1.1569	0.0625	0.8018	1.0345
F–value		16.75			15.28	
Sig.		0.0000***			0.0000***	
Durbin-Watson		1.4563			1.8755	
Number of samples		2,534			3,478	
$Adj.R^2$		0.141			0.225	

***$p<0.01$, **$p<0.05$.

(3) Robustness test of the moderating effect of positive media reports under different marketization degrees

First, the robustness test of H3a is carried out, and the positive media reports are regressed. The results are shown in Table 11.

It can be seen from Table 11 that the $Adj.R^2$ after regression of the low marketization level group and the high marketization level group are 0.214 and 0.198, respectively, indicating that the goodness of fit of the regression model is acceptable. The *F-value* were 27.34 and 19.24, respectively, and the *Sig.* were both 0.0000, which were significant at the 1% confidence level. The VIF of all variables does not exceed 2, and the *Durbin-Watson* are random error terms without autocorrelation. In high marketization regions, the regression coefficient between positive media reports and overconfidence ($P_{Media}2 \times OC1$) and overinvestment is much larger than that in low marketization regions, and it is significantly positive, which is consistent with the previous regression results.

Robustness test is carried out on the moderating effect of negative media reports under different marketization degrees, and the regression results are shown in Table 12.

It can be concluded from Table 12 that the adjusted R2 after regression of the low marketization level group and the high marketization level group are 0.141 and 0.225, respectively, indicating that the goodness of fit of the regression model is acceptable. The VIF of all variables does not exceed 2, and the *Durbin-Watson* are small, indicating that there is no autocorrelation in the random error term. Under the low marketization level, the regression coefficient of negative media report interaction term ($N_{Media}2 \times OC1$) and overinvestment is significantly negative, which is consistent with the above regression results.

Discussion

Policy recommendations at the enterprise level

Strengthening managers' self-learning and improvement

Studies have found that managers will have self-perception biases due to factors such as age, gender, and background, overestimating their own abilities and underestimating the probability of risk and failure. This kind of mentality will cause huge losses to the enterprise. In view of this, managers should improve their self-awareness, keep a clear head in business operations and treat them rationally, and avoid making irrational decisions such as overconfidence and overinvestment. Managers' learning of industry professional theory and relevant knowledge of risk assessment should be strengthened. The ability of managers to self-reflect and summarize should be strengthened, to obtain lessons from failure and successful experience, and to maintain a clear understanding of themselves at all times.

Establishing a sound and scientific investment evaluation system

First of all, before making investment decisions, enterprises should scientifically and rationally analyze the prospects and rates of return of investment projects, so as to avoid managers making wrong investment decisions due to high investment enthusiasm and irrational psychology. Secondly, enterprises should strengthen the supervision of management, and constantly improve the mechanism of checks and balances of power, so as to avoid excessive power of managers. Finally, enterprises should continuously improve and perfect the promotion incentive mechanism and career development path for managers, and reduce excessive investment due to the utilitarian psychology of pursuing performance.

Paying attention to and treating media reports rationally

Enterprises should pay attention to and treat media reports correctly and rationally, and maintain a good and healthy relationship between the media, enterprises and the public. For negative media reports, enterprises should reflect on their own behavior in a timely manner, and strive to make up for the losses caused to the enterprises, shareholders. Managers should analyze and evaluate positive media reports objectively and rationally, and avoid being overwhelmed by positive reports, resulting in high investment enthusiasm and irrational behaviors such as excessive investment.

Policy recommendations at the government level

Strengthening the media's role in supervising enterprises

As a supplement to the capital market supervision mechanism, the government should make full use of the media's public opinion advantage and play its role in external governance. The government should attach importance to and strengthen the media's negative reports and supervision of enterprises, and urge administrative supervision departments to strictly supervise relevant behaviors. It can be seen from the research that the media mechanism and the marketization process are the relationship of substitution. The media can better play the role of corporate governance in regions with a low degree of marketization. Therefore, especially in areas with a low degree of marketization, the media should pay more attention to and strengthen the supervision of enterprises, carry out negative reports and expose illegal activities, and play the role of corporate governance.

Guiding the healthy and orderly development of the media industry

First, the government should create a good environment for the media, ensure the freedom and independence of the media industry, and put an end to the phenomenon of "government-controlled media." Secondly, the government should guide the media industry to develop toward a healthier, more orderly, and more transparent development, reduce the phenomenon of media and enterprises colluding and mislead public opinion, and increase the punishment for media violations. In addition, with the rapid development of emerging media, the government should encourage traditional media to carry out industrialization reforms and pursue innovation and transformation in the context of big data.

Policy recommendations at the media level

Continuously improving the industry self-regulation and supervision system

The media should always ensure its own objectivity, report and disclose corporate information from a neutral standpoint, and treat any events and news without bias or exaggeration. The media should present facts and evidence to the public, ensure the reliability and timeliness of reports, correct deviations in media reports from the source, and truly play the role of media and information bridges. The media system must attach importance to the supervision and management of the industry, improve the ability of self-supervision and self-discipline, maintain the advanced nature and purity of the media industry system, and improve the overall image and credibility of the media in the minds of the public.

Accelerating the innovative transformation of the industry

Under the continuous advancement of the era of big data, the emergence of many emerging media such as self-media has caused a huge impact on traditional media. The media should accelerate their own industrial transformation, actively innovate, and use the Internet to promote more comprehensive, faster, and more efficient dissemination of media reports, and further expand their coverage, so that news media can truly become civilians.

Conclusion

This paper further explores the relationship between managers' overconfidence, media reports and enterprise overinvestment, puts forward the hypothesis of this paper, and collects and organizes the relevant data of A-share listed companies from 2013 to 2021. Through empirical analysis, the influence of overconfidence on overinvestment and the moderating effect of positive and negative media reports on the relationship between the two are deeply analyzed, and the robustness test is carried out. Finally the following conclusions are drawn:

(1) There is a positive correlation between managers' overconfidence and overinvestment. The higher the level of managerial overconfidence, the more likely it will lead the company to overinvest. Overconfident managers have a stronger sense of superiority, have strong egos and are overly optimistic about investment projects and business prospects, have high enthusiasm for investment, and underestimate or even ignore market risks. Therefore, overconfident managers will lead companies to invest in some non-quality projects, resulting in excessive investment, weakening enterprise value, and damaging shareholders' interests.

(2) Positive media reports can positively moderate overinvestment caused by overconfidence, while negative media reports can alleviate and negatively moderate overinvestment caused by overconfidence. Positive media reports will cause managers to become more enthusiastic about investment, which is more likely to lead companies to overinvest. Negative media reports can seriously affect the reputation of companies and managers. In order to restore the enterprise image and reputation, managers will reduce their enthusiasm for foreign investment, and will be more prudent and conservative in their investment decisions. They will fully consider market risks, thereby reducing excessive investment behavior, using the correct investment direction and high investment efficiency to restore enterprise image and re-attract investors.

(3) Compared with areas with a low degree of marketization, positive media reports in areas with a high degree of marketization will more obviously aggravate the overinvestment caused by managers' overconfidence. In regions with a low degree of marketization, negative media reports can better restrain the overinvestment caused by managers' overconfidence. This shows that media governance and the process of marketization are substitutes. In regions with a low level of marketization, negative media reports can play a greater role, and can better negatively regulate excessive investment caused by managers' overconfidence.

Research limitations and future development

(1) At present, there is no standard and authoritative measure to measure "manager's overconfidence." This paper draws on other scholars to choose "personal background characteristics" as a substitute variable to measure the psychological degree of managers' overconfidence, which has certain defects and is absolute.

(2) In this study, the selection of "media reports" only considers the paper media. With the advancement of science and technology in recent years, emerging media such as mass Internet have risen rapidly, and emerging media reports such as radio, TV, and online platforms such as TikTok or Weibo have also accounted for a large share. Not including emerging media is a shortcoming of this paper.

Based on the above deficiencies, prospects for more in-depth research in the future are put forward: evidence from other countries (United States, Europe) will be added to complement existing methods. Exploring the rationality of the method used in this paper and exploring a more optimized way are the future research priorities and trends in this field. In addition, in addition to traditional media, media report data from other channels such as the Internet and TV should also be considered. Therefore, in the era of big data and the emerging trend of emerging media, we will explore how countries around the world can more comprehensively include media report data and information, and strive to obtain more comprehensive and complete media report data.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Author contributions

The author confirms being the sole contributor to this work and has approved it for publication.

Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

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The relationship between organizational commitment and turnover intention among temporary employees in the local government: Mediating role of perceived insider status and moderating role of gender

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Purpose: The purpose of this study is to examine the relationships between organizational commitment and turnover intention, and to test the mediating effect of perceived insider status, and moderating effect of gender on that relationship.

Methodology: Data were collected using a questionnaire survey method from 820 temporary employees of government agencies working in China. The data obtained were analyzed according to the moderated mediation.

Findings: As a result of the analysis, it was determined that perceived insider status has a partial mediation effect on the relationship between organizational commitment and turnover intention. Also, the results supported the moderated mediation and showed that the indirect effect of organizational commitment and turnover intention through perceived insider status was weaker for males than females. Then, the theoretical and practical implications of the findings are discussed.

KEYWORDS

turnover intention, temporary employees, perceived insider status, local government, organizational commitment

Introduction

With the continuous development of the economy and society, the government has taken on more and more responsibilities in economic construction, social management, people's livelihood, and public services, which has placed higher demands on the ability and efficiency of government departments to perform their duties (Joo et al., 2015). Under the general policy of "no increase but a decrease" in the number of financially-supported staff, the existing stable staffing management can hardly meet the needs of the increased responsibilities. Nonrenewable fixed-term and temporary agency employment contracts began to gradually replace the traditional model of long-term employment, and the proportion of temporary employees in China has continuously increased in recent years (Liu, 2015; Duan et al., 2021; Liu X. et al., 2022). The temporary supernumerary staff has become an important way and channel to make up for the shortage of human resources in government agencies and institutions at all levels (Conway et al., 2016).

Temporary employees in the local government refer to workers temporarily hired by the government through public finance to assist government departments and agencies in public management activities or administrative affairs, and these workers are not government workers with a formal establishment (Lapalme et al., 2009). We need to acknowledge the complexity underlying the concept of temporary workers in China (Duah et al., 2015). Due to the limitations of government financial resources and the number of formal staff, there are a large number of temporary personnel in China's government agencies to cope with the huge and complex social management needs. The existence of temporary workers can be considered a cost-cutting, human resource-management tool for solving unemployment. Temporary government employees in the government can well alleviate the plight of insufficient personnel in formal bureaucratic organizations, and make important contributions to the normal operation of government departments and social development. However, temporary workers also receive less protection and more job insecurity (Balz, 2017; Guo et al., 2022). Considering the low-level work and low wage guarantees, there are problems of weak organizational commitment and high turnover, and the difference in employment status affects the stability of employment relationships. Thus, it is of great significance to investigate the turnover intention and influencing factors of temporary employees in the government to maintain the operation of formal bureaucracy and social management.

We review the existing studies on temporary organizations or temporary employees. Some studies try to explain the growth of temporary work in China from the perspective of institutional and organizational characteristics (Liu, 2015). Some studies focus on the differences in work behavior between temporary employees and permanent employees, like engaging in deviant behaviors, employee performance, and turnover intentions (Nuhn et al., 2018; Liu X. et al., 2022). In addition, there is a lot of research using the framework of social exchange theory, self-determination theory, psychological compensation, and social identity theory to investigate the impact of organizational identity, and job insecurity on work attitudes, work engagement, and so on (Slattery et al., 2010; Jiang and Wang, 2018; Zhang et al., 2018; Duan et al., 2021; Guo et al., 2022; Jing and Yan, 2022; Liu X. et al., 2022). However, the use of temporary employment has increased in local government, but few studies to date have analyzed the turnover intentions of temporary employees in the local government (Liu X. et al., 2022). Studies conducted on the turnover intention of government temporary have mainly sorted out the management of government temporary personnel from the macro aspect (Hu, 2015).

The purpose of this paper is to combine social identity, social exchange, and role conflict theories into a model explaining the turnover intentions of temporary employees in the local government from an individual level. Therefore, this study tries to investigate the relationship between organizational commitment and turnover intention, as well as the mediating role of perceived insider status and the moderating role of gender, to reduce the detrimental effects of turnover intentions from temporary employees, promote their motivation, and provide informative policy recommendations for improving the management of government temporary staff.

Literature and hypotheses

Organizational commitment and turnover intention

Organizational commitment is linked with a strong desire amongst employees to remain within their organizations, the identification and reliance of employees on organizational goals, values, etc., as well as their internal driving force to stay in the organization and an important manifestation of their loyalty to the organization (Porter et al., 1973; Loan, 2020; Nisar and Rasheed, 2020; Novianti, 2021). Three dimensionalities of organizational commitment include affective commitment, continuous commitment, and normative commitment (Allen and Meyer, 1990; Meyer and Allen, 1991). Affective commitment is the most fundamental of these elements, which is related to the individual's recognition and evaluation of his status and value, and whether he has a sense of identity and commitment to his organization. Organizational commitment is an internal subjective consciousness, which is derived from the effect of the organizational environment on people, and the result of this effect will further affect the behavior of people in the organization (Belle et al., 2015).

Following social identity theory, temporary employees usually perceive high job insecurity, which concerns the perception of an involuntary and undesired change in the continuity of the work situation (Balz, 2017; Liu X. et al., 2022). Previous studies have shown that organizational commitment is an important factor affecting turnover intention. Having a sense of organizational commitment will promote employees to work hard in the organization and reduce turnover intention (Chung et al., 2017), the lack of commitment will reduce employees' efforts to work and lead to the emergence of the propensity to leave (Boros and Curşeu, 2013; Joo et al., 2015; Shaikh et al., 2022). Research on Chinese enterprises and state-own enterprises supports the correlation between organizational commitment and employees' willingness to leave (Jing and Yan, 2022; Liu X. et al., 2022). In light of the evidence reviewed in this section, we propose the following hypothesis:

> *Hypothesis 1*: The organizational commitment of government temporary employees negatively correlates with their turnover intention.

Organizational commitment and perceived insider status

Perceived Insider Status was first proposed by Stamper and Masterson, is defined as the extent to which an individual employee perceives him or herself as an insider within a particular organization, describing employees' cognition of their identity status in the organization, feeling accepted and recognized by the organization, and truly becoming the "internal people "of the organization (Stamper and Masterson, 2002; Dai and Chen, 2015; Koçak, 2020; Xiao et al., 2020; Liu D. et al., 2022). An important view in insider identity cognition research is to explain the employee-organization relationship based on the social exchange theory, arguing that differences in organizational attitudes perceived by employees will have an important impact on employee performance or other outputs (Liu D. et al., 2022). There is a huge difference in the identities of casual and regular workers (Knapp et al., 2014). Researches show that perceived insider status has a strong effect on employees' job performance and organizational citizenship behavior. When employees continue to gain support and trust from the work, they actively see themselves as the owners of the organization, which is the process of insider status perception. On the other hand, employees with a strong sense of organizational commitment will have a stronger identification with organizational values and organizational behavior. When employees consider that the organization cherishes them, they will have a deeper perception of acceptance they have obtained in the organization (Wang et al., 2021; Guo et al., 2022). Therefore, employees' sense of organizational commitment will significantly affect their perceived insider status. Based on the evidence relating to organizational commitment and perceived insider status, we propose the following hypothesis:

> *Hypothesis 2*: The organizational commitment of government temporary employees positively correlates with their perceived insider status.

Perceived insider status and turnover intention

Perceived insider status can be affected by personal and organizational factors, which in turn can affect employee behavior in the organization. Relevant studies have investigated the role of perceived insider status as a predictor of attitudinal and behavioral work outcomes, especially in the relationship between individuals and organizations (Raub, 2016; Chen et al., 2017). Once new employees perceive themselves to be seen as organizational insiders, they have a strong sense of belonging, actively work for the organization, and do not want to leave the organization. In a highly collective cultural society, obtaining personal space and insider status is the precondition that Chinese employees devote themselves to work. Previous research results have confirmed that employees' perceived insider status is negatively correlated with their turnover intention (Knapp et al., 2014). Employees' willingness to stay in the organization is largely influenced by their level of involvement in the organization and the extent to which the organization recognizes them (Shao et al., 2022). Compared with permanent employees, temporary workers have a lower sense of insider status and are more likely to leave their jobs because they worry about their future jobs and their low status among members (Arain et al., 2018; Liu X. et al., 2022). Based on this information, the following hypothesis has been developed:

> *Hypothesis 3*: Perceived insider status may affect turnover intention negatively.

The mediating role of perceived insider status

Combining the three hypotheses above, it is easy to find that the impact of organizational commitment on the turnover intention of government temporary employees may partially affect the identity of insiders. Studies have shown that after the needs of employees in the organization are met, they will have a sense of attachment to the organization, so their willingness to continue to maintain membership in the organization will be stronger, and the generation of turnover behavior will be reduced (Knapp et al., 2014). The higher the employee's sense of identity in the organization, the stronger the insider's identity, the more willing they are to stay in the organization, and the lower the turnover intention (Oh, 2019). Based on the above predictions of this paper, the relationship between organizational attachment and their propensity to leave among government temporary employees may be significantly mediated by a certain factor, which may be the perception of insider status (Slattery and Rajan Selvarajan, 2005; Caron et al., 2019). This conjecture also reveals the deeper mechanism of how organizational commitment affects turnover intention. Considering the explanations, Hypothesis 4 is formed as follows:

> *Hypothesis 4*: Perceived insider status may mediate the relationship between organizational commitment and turnover intention.

The moderating role of gender

Turnover intention is a complicated manifestation, which is a comprehensive performance of job dissatisfaction, leaving

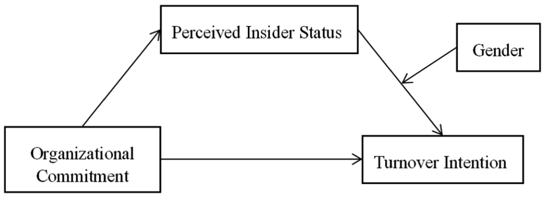

FIGURE 1
Theoretical framework.

TABLE 1 Sample description.

Demographic variable	*N* (%)
Gender	
Male	456 (55.61%)
Female	364 (44.39%)
Age	
≤20	16 (1.95%)
21–30	444 (54.15%)
31–40	248 (30.24%)
≥40	112 (13.66%)
Education level	
Senior high school or less	36 (4.39%)
College	272 (33.17%)
Undergraduate	376 (45.85%)
Postgraduate and above	136 (16.59%)
Years of work	
≤1 year	172 (20.98%)
1–3 years	412 (50.24%)
3–5 years	152 (18.54%)
≥5 years	84 (10.24%)

thoughts, looking for other jobs, and the possibility of finding other jobs (Boros and Curşeu, 2013; Flickinger et al., 2016; Jing and Yan, 2022). In addition to the factor of perceived insider status, the influence of individual factors on turnover intention should also be considered. Several studies have suggested that the relationship between gender should affect the relationship between our variables of interest because men generally attain a higher status and potentially more fulfilling roles in organizations (Russ and McNeilly, 1995). Due to the different social expectations of male and female roles, traditional women are more played family roles and more men play characters still affects the positioning of characters (Kerr and MacCoun, 1985). Society's expectations for different genders make each gender align with their behavior patterns (Bussey and Bandura, 1999). Therefore, men's and women's sense of belonging to the organization, resignation behavior, and resignation tendencies are also different. If gender acts as a moderator, a major reason may be the recurring finding that women place greater importance on social relationships.

Combining gender role stereotypes and role conflict theory, men feel a strong sense of insider identity and have a lower turnover intention when they have a high sense of organizational commitment, which is inseparable from gender roles. Society's perception of women is that family attributes are stronger than work attributes. In addition, women take on more responsibility for caring for the family and raising children than men (Petrongolo, 2019). Studies have found that compared with men, women are more vulnerable to family burdens, which limits their commitment to work (Camgoz et al., 2016; Lee et al., 2017). Therefore, under the same high level of organizational commitment, women may still have a higher turnover intention due to the influence of perceived insider status. Thus, we propose the following hypothesis:

> *Hypothesis 5*: Gender plays a moderating role between perceived insider status and turnover intention.

The theoretical framework of this study can be summarized as follows (see Figure 1).

Materials and methods

Sample and procedure

In this study, questionnaires were distributed to temporary employees of government agencies in Henan Province through Questionnaire Star (restricting the terminals fulfilling in the questionnaires through IP addresses), and a total of 840 questionnaires were recovered with 820 valid questionnaires obtained, and the effective recovery rate was about 97.62%. Among them, as shown in Table 1: (1) The number of male samples is more than that of women, accounting for about 55.61%; (2) the number of samples in the 21–30-year-old stage is the largest, accounting for about 54.15% of the total number of samples, followed by 31–40 years old, accounting for 30.24%, which is also in line with the actual situation of this group; (3) the number of samples with undergraduate and college degrees There are many people, accounting for 45.85 and 33.17% of the total sample respectively, and only 16.59% of the graduate students and above. It can be seen that the educational background of this group of people is mostly at the undergraduate level or below; (4) in terms of working time in the current agency, more than 70% belong to <3 years, of which 1–3 years account for about 50.24% of the total sample size, <1 year accounted for 20.98%, 3–5 years accounted for 18.54%, and more than 5 years accounted for only 10.24%. Most government temporary employees have a relatively short working life in the current unit.

Measures

In this study, measuring scale items were adopted from the existing literature and adapted into the Chinese context with the help of bilingual researchers and m-government experts. Before conducting the survey, we pilot-tested 50 citizens to make sure of the logical consistency, wording, meaning, and appropriateness of the instruments. All items were measured using a 5-point Likert scale ranging from "strongly disagree = 1" to "strongly agree = 5."

Organizational Commitment. Three-Factor Organizational Commitment Scale compiled by Allen and Meyer (1990) was slightly modified according to the characteristics of the research subjects. The scale consists of three parts. The first part is the question of emotional commitment, with 4 items including "I have deep feelings for the unit" and "I would like to make any contribution to the unit"; the second part is the question of continuous commitment, there are 4 items such as "I continue to work in this unit because the benefits here are good," "I feel that there are great opportunities for promotion here, and it is beneficial to me to stay here"; the third part is Normative commitment, including "I have responsibilities and obligations to the unit," "I think job-hopping is immoral" and other 4 items, a total of 12 questions. The overall Cronbach's alpha coefficient of organizational commitment was 0.813, and the Cronbach's alpha coefficients of emotional commitment, continuous commitment, and normative commitment were 0.758, 0.685, and 0.615, respectively, all between 0.6 and 0.8.

Perceived Insider Status. The 6-item scale developed by Stamper and Masterson (2002) was translated and adjusted by Chen and Aryee (2007) in a Chinese context-oriented study, which showed that the scale has high reliability and is more practical in the Chinese context. The scale includes 3 positive scoring items, "I feel strongly that I am a member of this work unit," and three negative scoring items, "I feel that I am an outsider in this work unit." Cronbach's alpha coefficient for perceived insider status is 0.871.

Turnover Intention. The 4-item scale compiled by Farh et al. (2007) was used, and some modifications were needed in combination with this study. There are 3 positive scoring questions including "I often think about quitting my current job," and 1 reverse scoring question "I plan to do long-term career development in this unit." Cronbach's alpha coefficient for turnover intention is 0.889.

In this study, SPSS statistical software was used to analyze the data. A descriptive analysis was performed to examine the characteristics of the samples. A correlation analysis was performed to examine the correlations between each variable, and an effective method was used to examine causal relationships and moderating effects in studies focused on our topic.

Results

Reliability and validity

The Cronbach's alpha of each variable was measured to test the reliability of the variables, all of the Cronbach's alpha values are above 0.70, indicating high instrument reliability. The KMO values of the organizational commitment scale perceived insider status scale, and turnover intention scale is all >0.7, $p < 0.05$, the results indicate that there is a correlation between variables, suitable for factor analysis, and the questionnaire has better structural validity. Collecting data by the self-report method may lead to common method bias. Therefore, this study first used Harman's single-factor test to verify common method variance. It was found that there were 4 factors with eigenvalues >1 in the unrotated case, and the largest factor varies nicely explained the degree of accuracy was 38.79% (<40%), so there is no serious common method variance in this study.

In addition, to ensure the validity of the regression analysis results, Collinear Diagnostics was used to test the multicollinearity problem between independent variables, and measure the tolerance and variance inflation factor (VIF) indicators. Tolerance and variance inflation factor are reciprocal to each other, the smaller the VIF, the weaker the multicollinearity, if the VIF is ≥10, it indicates that there is a very serious multicollinearity between the independent variables, it is generally believed that VIF should not be >5. In the regression analysis of this study, the VIF of the independent variables was <5, indicating that there was no multicollinearity between the variables and that the questionnaire validity was good.

Hypotheses testing

Table 2 provides the descriptive statistics and correlation among key variables. As seen in Table 2, each variable was significantly correlated with the others. It is seen that organizational commitment is negatively correlated with turnover intention, and positively correlated with perceived insider status In addition, perceived insider status is negatively correlated with turnover intention. This result provides preliminary evidence for our model.

Test of mediation

According to Hayes (2013) and Wen and Ye (2014), Model 4 of the SPSS macro program PROCESS is used to test the mediating effect of perceived insider status in the relationship between organizational commitment and turnover intention.

Results in Table 3, regression analysis showed that organizational commitment not only directly predicted turnover intention (*H*1; $B = -0.80$, $p < 0.01$) but also indirectly through perceived insider status; organizational commitment had a positive effect on perceived insider status (*H*2; $B = 0.84$, $p < 0.01$); perceived insider status significantly and negatively predicted turnover intention (*H*3; $B = -0.46$, $p < 0.01$). Based on the Bootstrap method using 5,000 bootstrap sample indicate that perceived insider status mediated significantly and partially between organizational commitment and turnover intention (*H*4; $B = -0.38$, $p < 0.01$, at 95%LLCI = −1.09, ULCI = −0.57).

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TABLE 2 Summary statistics and correlation matrix.

	M	*SD*	1	2	3	4	5	6
1. Organizational commitment	2.596	0.401	1					
2. Emotional commitment	2.831	0.591	0.834**	1				
3. Continued commitment	2.465	0.519	0.776**	0.406**	1			
4. Normative commitment	2.493	0.401	0.764**	0.498**	0.431**	1		
5. Perceived insider status	2.703	0.506	0.812**	0.677**	0.672**	0.566**	1	
6. Turnover intention	3.449	0.648	−0.812**	−0.652**	−0.725**	−0.536**	−0.799**	1

*$p<0.05$, **$p<0.01$, ***$p<0.001$.

TABLE 3 Regression analysis results of the mediating effect.

			B	*SE*	*t*	*p*
The direct effect of OC on TI			−0.80	0.10	−8.08	0.000
OC has a positive effect on PIS			0.84	0.06	13.63	0.000
PIS has a negative effect on TI			−0.46	0.08	−5.49	0.000
	Value	***SE***	**LL95%CI**	**UL95%CI**		
Indirect effect	−0.38	0.09	−0.55	−0.21		
	M	***SE***	**LL99%CI**	**UL99%CI**		
Bootstrapped indirect effect	−0.81	0.13	−1.09	−0.57		

$N=820$; Bootstrap sample size = 5,000; CI, confidence interval; LL, lower limit; UL, upper limit; OC, organizational commitment; PIS, perceived insider status; TI, turnover intention.

Test of moderated mediation

Hypothesis 6 predicted that gender will play a moderating role between perceived insider status and turnover intention. The moderating effect is tested using the Model 14 of the SPSS macro program PROCESS. The results in Table 4 show that the effect of perceived insider status and gender interaction (PIS × G) on turnover intention was significant ($B=-0.26$, $p<0.05$). To further explain the moderating effect of gender, a simple slope test was performed for both male and female groups. Figure 2 was formed using the data obtained to determine whether the effect of perceived insider status on turnover intention shows significant differences according to the different gender. As a result of the investigations, it was found that the relationship between perceived insider status and turnover intention was weaker for males than for females. The conditional indirect effect refers to the significant change of indirect effect according to the different levels of gender. Besides when the results of the model index are examined, the moderated mediation index is significant due to not containing 0. To say that Hypothesis 5 is fully supported, when the gender was male, the mediating effect value was −0.28; while when the gender was female, the mediating effect value decreased to −0.50.

Discussion and implications

Discussion

Firstly, the results show that organizational commitment of government temporary employees is significantly negatively correlated with turnover intention. Sustained commitment refers to an awareness of sunk costs and a willingness to stay in an organization as individuals increase their commitment to the organization. The data of this study shows that more than 50% of the government temporary employees have worked in the unit for 1–3 years. Most of the temporary employees' wages are only higher than the local minimum wage and are half of the formal civil servants (Yang and Yang, 2022). Due to the short working time and low wages, they are aware of relatively few sunk costs, which leads to a low sense of continuous commitment for this group of people. Emotional commitment is the recognition and acceptance of organizational goals and values by employees. Most of the team-building activities and training activities in the unit do not include temporary employees, which to a certain extent leads to the low emotional commitment of this group of people to the organization (Avanzi et al., 2014). Normative commitment means that employees feel an obligation and responsibility to remain in the organization. However, 54% of government temporary employees are between the ages of 21 and 30, most of them are young employees, and they are less constrained by traditional thinking (Liu X. et al., 2022), so they are less affected by normative attribution when choosing to leave. Organizational commitment increases with promotion, but government temporary employees are mostly in lower-level jobs that are temporary and have poor career prospects (Wu, 2021). It is very difficult for non-staff temporary employees to get a promotion.

Secondly, the perceived insider status of government temporary employees has a partial mediating effect. That is to say, the organizational commitment of government temporary employees can not only directly affect the turnover intention, but also affect the turnover intention through the intermediary role of perceived insider status. Government temporary employees' perception of their insider identity will directly affect their turnover intention. When government temporary employees have a strong sense of belonging to the organization, they will take the initiative to regard themselves as the owners of the unit, and are more willing to stay in the organization (Jiang and Wang, 2018).

Thirdly, gender plays a moderating role between perceived insider status and turnover intention. When the staff is male, the perceived insider status has a significant negative predictive effect on their turnover intention; while when the temporary recruit is female, the perceived insider status hurts their turnover intention. Enhance the predictive effect. Therefore, it shows that under the same level of perceived insider status, different genders have different negative effects on turnover intention, that is, under the same insider identification result, women are more likely to have turnover intention. The reason for this result may be that the social cognition and role positioning of different genders are different, and men and women act according to the behavioral standards given by society, thus forming different behavioral patterns of the sexes, which are also manifested in psychological cognition. Influenced by traditional Chinese gender concepts, women tend to identify more with family roles, while men are more identified with work roles (Lee et al., 2017; Liu and Ngo, 2017).

TABLE 4 Regression results for moderated effect.

Predictor	*B*	*SE*	*t*	*p*
DV = perceived insider status				
Organizational Commitment	0.86	0.06	13.97	0.0000
DV = turnover intention				
Perceived insider status (PIS)	−0.06	0.18	−0.35	0.729
Gender (G)	0.56	0.29	1.91	0.058
PIS × G	−0.26	0.11	−2.37	0.019
Gender	**Boot indirect effect**	**Boot *SE***	**Boot *z***	**Boot *p***
The conditional indirect effect on gender				
Male	−0.28	0.09	−3.19	0.000
Mediated intermediary	−0.23	0.11	−8.39	0.000
Female	−0.50	0.11	−5.98	0.000

DV, dependent variable.

Conclusion and research implications

In general, this research tried to enrich the understanding of underlying mechanisms between organizational commitment and turnover intention among temporary employees in local governments in China. This paper investigated the relationships between organizational commitment and turnover intention and tested the mediating effect of perceived insider status, and moderating effect of gender on that relationship using a questionnaire survey method from 820 temporary employees of government agencies working in China. As a result of the analysis, it was determined that perceived insider status has a partial mediation effect on the relationship between organizational commitment and turnover intention. Also, the results supported the moderated mediation and showed that the indirect effect of organizational commitment and turnover intention through perceived insider status was weaker for males than females.

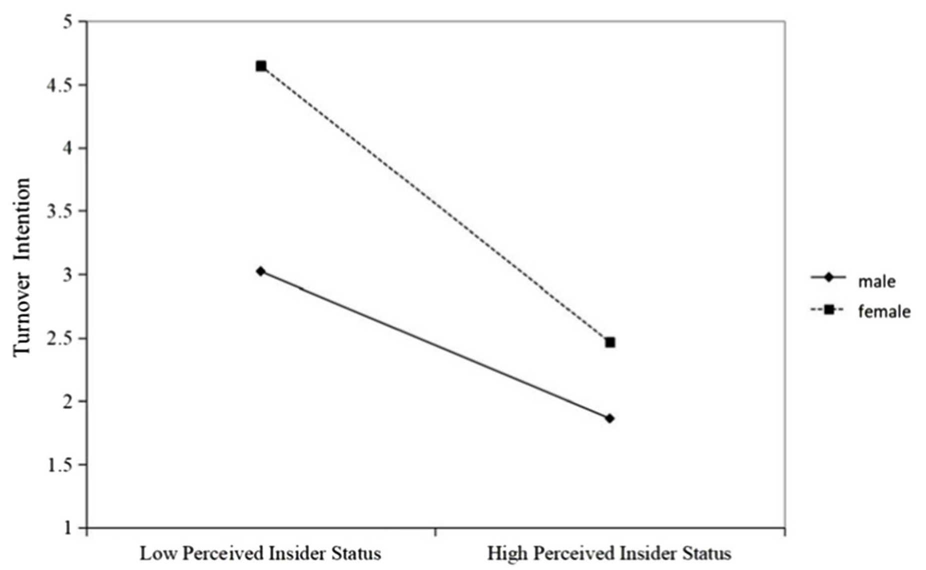

FIGURE 2
The moderating effect of gender.

Moreover, some suggestions for governments to decrease the turnover of their employees may be as follows.

For managers and organizations, this study suggests some practical implications. First, research findings revealed that turnover intention and organizational commitment are directly affected by organizational commitment. Managers can increase emotional commitment by taking into account temporary employees' emotional needs, creating a positive, relaxed, and pleasant organizational atmosphere and environment. At the same time, a career management system in line with the actual situation of government temporary employees might be considered, to help temporary employees break the promotion "ceiling" and enhance their continued commitment. In addition, a variety of training activities are carried out to improve work skills, relieve work pressure, adjust work mentality, and improve the sense of normative commitment of temporary employees.

Second, research findings demonstrate that perceived insider status negatively predicts the turnover intention of government temporary employees and mediates the relationship between organizational commitment and turnover intention of government temporary employees. Therefore, government managers can positively contribute to the decrease of turnover intention, increasing perceived insider status by enhancing the sense of team support, giving respect and trust, and helping government temporary employees truly participate in organizational decision-making.

In addition, this study also highlighted the indirect effect of organizational commitment on turnover intention through perceived insider status is strong when the gender is female. Therefore, managers may pay more attention to the characteristics and needs of different genders, like flexible working hours, and family support plans. Also, some support may be helpful to get closer to employees to understand the psychological demands and expectations of employees of different genders and integrate the pursuit and development of temporary employees.

Limitations and future research

In summary, the results of this study verify the hypothesis and have a certain value for systematically understanding the relationship between organizational commitment and turnover intention of government temporary employees, but there are still some deficiencies, and follow-up research can be improved in the following aspects: The first limitation of this study is the selection of research samples, which are affected by objective factors such as time and geographical factors. Therefore, future research should fully consider regional differences to improve the representativeness of the sample. Furthermore, the turnover intention is expressed as the psychological tendency of employees to leave their current work, which reflects the two-way interaction between temporary employees and the organization. However, because the behavior process of the organization is more complicated to measure, the research on turnover intention is only from the perspective of temporary employees. In the future, the research should be further enriched and developed from the perspective of both temporary staff and the government.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Author contributions

DX conceived of the presented idea. JS developed the theory and performed the computations. YZ verified the analytical methods. CZ supervised the findings of this work. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Influence of leadership empowering behavior on employee innovation behavior: The moderating effect of personal development support

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The main purpose of this study is to explore the influence of leadership empowering behavior (personal development support, participative decision making and delegation of authority) and thriving at work (vigor, learning) on employee innovation behavior and analyze the moderating effect of personal development support on participative decision making and innovation behavior. The questionnaire survey method is used to survey Chinese industrial workers, and a total of 290 valid questionnaires are collected. The model is verified using SmartPLS. Results show that the personal development support and participative decision making dimensions of leadership empowering behavior have a significant positive influence on employee innovation behavior. Vigor and learning has a significant positive influence on employee innovation behavior, and personal development support has a significant moderating effect on the relationship between participative decision making and innovative behavior.

KEYWORDS

leadership empowering behavior, participative decision making, thriving at work, employee innovation behavior, personal development support

Introduction

Independent innovation is the key for modern enterprises to build core competitiveness in a dynamic environment and related to their survival and development (Wang and Nickerson, 2017). Moreover, individual innovation is the foundation of organizational innovation (Zhao et al., 2021). As the main body of enterprise innovation, employees' innovation behavior has a positive influence on enterprise innovation performance (Miron-Spektor and Beenen, 2015; Usai et al., 2020). Thus, research on employees' innovation behavior has become a hot issue.

Early research on employees' innovation behavior concentrated mostly on the field of psychology from the perspective of personal characteristics (Petrosyan, 2019), and subsequent research focused gradually on the influence of external situational factors

(Zuraik et al., 2020). As an important part of the external context, leadership plays an important role in corporate innovation. Leadership style and manner can directly or indirectly influence employees to demonstrate innovative behavior. Through empowerment, leaders can make employees feel the company's support and attention, which will lead to innovation behavior. Therefore, exploring how to improve employees' innovative behavior from the perspective of leadership is essential. However, most studies started only from the perspective of leadership style, such as transformational, authentic, service-oriented and ethical leadership, to explore the influence of leadership on employees' innovative behavior (Michaelis et al., 2010; Özsungur, 2019; Bagheri et al., 2020; Zhang et al., 2021b), and research on the effect of leadership empowerment on employees' innovation behavior is limited. Although studies showed that leadership empowerment has a positive influence on employees' innovation behavior, the action mechanism between the two factors is unclear. Does leadership empowerment directly or indirectly affect employees' innovation behavior? What other factors exist in this influence? Previous studies failed to confirm such issues in detail.

In addition, numerous studies revealed that thriving at work plays an important role in the innovation behavior of employees, but limited research incorporated leadership empowering behavior and thriving at work into research models and explored their influence on innovation behavior at the same time. Moreover, does this role exist in the context of Chinese high-tech enterprises? Is it a positive or negative regulation? Employees' innovation behavior is affected by not only the external leadership environment but also individual factors. Research at home and abroad showed that personal development support has a significant influence on employees' innovation behavior (Rigopoulou and Kehagias, 2008), but previous research failed to provide a clear answer on how this influence works. In addition, participative decision making was confirmed by a large number of studies to have an influence on the innovation behavior of employees within an enterprise (Sarafidou and Chatziioannidis, 2013; Huang et al., 2015; Wilson, 2016; Salomé and Andrea, 2017), and delegation of authority typically emerges in the process of corporate management (Li L. et al., 2020; Liu X. et al., 2020). Enterprises maintain an open attitude towards power appointment, which will create the power appointment management atmosphere, and employees' perception of a power appointment will have an influence on their innovation behavior.

Therefore, after defining the concepts of 'leadership empowerment' and 'employee innovation behavior', this study constructs a 'leadership empowering behavior–thriving at work–employee innovation behavior' research framework and introduces delegation of authority and participative decision making into the research framework. From the perspective of social cognition and empowerment theory, this study explores the influence path and mechanism of leadership empowerment on employees' innovation behavior and determines whether personal development support can effectively regulate the relationship between participative decision making and employees' innovation behavior. The conclusions of this study may have theoretical significance and guide management practice for research on employees' innovation behavior to help leaders inspire employees' innovation behavior and improve corporate innovation performance.

This paper is mainly divided into seven parts. The first section introduces the research background, significance and content of the influence of leaders' empowering behavior on employees' innovation behavior. The second section presents the literature review of research on employees' behaviors empowered by leaders, thriving at work and innovation behavior. The third section constructs the research model of the influencing factors of leadership empowering behavior and thriving at work for employees' innovation behavior and presents the research hypotheses. The fourth section systematically combs through the variables and measurement items included in the research model, describes the questionnaire and research methods and explains the data analysis techniques used in this research. The fifth section analyses the data of the collected valid questionnaires and draws the conclusions. The sixth section assesses and summarizes the research conclusions, and the seventh section identifies the research limitations and future research prospects.

Background

Leadership empowering behavior

Leadership empowering behavior was first proposed by Konczak et al. (2000) as a series of management behaviors adopted by leaders to empower employees. Leadership empowering behavior is a type of special leadership style differing from traditional leadership. Leadership empowering behavior occurs between a leader and a subordinate, emphasising the process of power sharing between a leader and employees and allowing employees to develop self-control and perform tasks autonomously (Vecchio et al., 2010; Sharma and Kirkman, 2015). In addition, leadership empowering behavior is an implementation process, the core of which involves a leader delegating power to employees, eliminating employees' sense of powerlessness and enhancing employees' autonomy to stimulate their intrinsic motivation and promote their development as well as that of the company (Thomas and Velthouse, 1990; Le and Wei, 2011). The essence of leadership empowering behavior is a series of management behaviors (Oedzes et al., 2019) to share information and rights with employees (Vecchio et al., 2010) and promote psychological empowerment to provide employees with increased opportunities to participate in decision making, which will improve their self-efficacy and work performance (Seibert et al., 2011; Auh et al., 2014).

Scholars conceptualized and verified the dimensions of this unique set of leadership behaviors and distinguished them from other related leadership structures. For example, Arnold et al.

(2000) identified five key aspects of leadership empowering behavior, that is, leading by example, participative decision making, guiding, informing and mutual attention. Ahearne et al. (2005) analyzed four dimensions of leadership empowering behavior, specifically, delegation of authority, participative decision making, trust in subordinates and strengthening the meaning of work. Amundsen and Martinsen (2015) believed that the two core dimensions of leadership empowering behavior are independent support and development support. Meanwhile, Pearce and Sims (2002) argued that encouraging employees to develop their abilities, promoting employee autonomy, supporting employees to seek opportunities actively, attaching importance to teamwork, setting goals reasonably, and strengthening employees' self-management should be the six important aspects of leadership empowering behavior. Konczak et al. (2000) identified six dimensions of leadership empowering behavior, namely, delegation of authority, support innovation, independent decision making, skills development, information sharing, and taking responsibility.

Although the aforementioned scholars adopted different perspectives on the dimensional division of leadership empowering behavior, numerous common points exist, which describe the empowering role of leadership empowering behavior and transform previous "management + control" behavior into "help guide", "strengthening the meaning of work", and "team interaction" to reshape the value of work. They transform from the abstract behavior of strengthening the "trust atmosphere" into the equal communication behavior of leaders' "information sharing" and from previous "top-down" decentralization into leaders' encouragement of employees to "participate in decision making". Based on previous research, this study examines the influence of leadership empowering behavior on employees' innovation behavior from the three dimensions of personal development support, participative decision making and delegation of authority and investigates the relationship between the three dimensions.

Thriving at work

Thriving at work is a concept of active organizational behavior, including two dimensions, namely, vigor and learning. The vigor dimension examines whether employees feel energized and enthusiastic at work, and the learning dimension mainly examines whether employees have self-confidence from mastering knowledge or skills (Spreitzer et al., 2005; Wang et al., 2019). Compared with work investment, in addition to vigor, thriving at work places more emphasis on employee learning and growth experience. Research confirmed that a high degree of thriving at work energizes employees and gives them a sense of growth and a high level of innovation at work (Sia and Duari, 2018; Shahid et al., 2021). Therefore, enhancing employees' sense of thriving at work is significant for improving their innovation behavior.

Existing empirical studies extensively verified the positive relationship between thriving at work and work performance (Cynthia et al., 2015; Frazier and Tupper, 2016; Walumbwa et al., 2017). Recently, a meta-analysis of 73 empirical research papers concluded that work exuberance has a predictive effect of 0.35 on work performance (Kleine et al., 2019). The positive mental state of thriving at work can generate increased positive experiences and resorces and improve work performance (Wang and Meng, 2021). According to the above research, empowering leadership is conducive to improving thriving at work, and a strong correlation exists between the two factors. Therefore, the present study includes thriving at work in the research scope. Learning and vigor are two key variables of thriving at work. Many scholars confirmed the positive influence of learning on employees' innovation behavior (Víctor et al., 2008; Chung and Li, 2021). This study uses vigor and learning to represent employee prosperity and conducts research on employees' innovation behavior.

Innovation behavior

Kanter (1988) first pointed out that individual innovation behavior can be divided into three stages, from identifying problems and proposing solutions to forming groups to realize ideas and finally spreading the innovative results. This definition includes the initiation and result of innovation behavior rather than merely action. Scott and Bruce (1994) emphasized that employees' innovation behavior involves the individual identification and understanding of problems and building an innovation team to put the innovative ideas into practice and finally commercializing the action of innovative practices. This process completes the generation, development and realization of ideas. Moreover, the process is a combination of a series of discontinuous activities, with different relatively independent innovation activities in each stage. Amabile et al. (1996) regarded innovation as a new idea, new scheme and work path that can bring value to an organization. Meanwhile, Kleysen and Street (2001) argued that innovation behavior should be understood comprehensively, from the initial discovery of opportunities to the initiation of ideas, multifaceted evaluation of innovation, creative support, and finally, the realization of the creative ideas. Shen et al. (2017) believed that the concept of employee innovation behavior is to generate innovative ideas at work and turn ideas into practice.

Kirton (1976) posited that employees' innovation behavior is affected by their characteristics. If employees enjoy thinking about problems in accordance with their original path, then their innovation behavior will be minimal. However, if employees tend to find different ways to ponder problems, then they will demonstrate considerable innovative behavior. Innovation behavior involves not following the existing path, pondering a problem spontaneously and solving the problem in a unique way.

In summary, this study uses the viewpoint of Scott and Bruce (1994) to define employee innovation behavior as producing or adopting new methods, ideas and technologies and putting them into practice in the actual production activities of an organization to improve original management procedures or practices and enhance the organization's production efficiency.

Research model

Leadership exerts an important influence on employee innovation. An increasing number of studies showed that leadership is a key factor promoting innovation (Hammond et al., 2011; Miao et al., 2018), that is, support and encouragement from leaders have a significant positive influence on employees' innovation. The more a leader delegates rights to employees, and the more the support and encouragement given to employees, the more the creativity demonstrated by the employees (Assen, 2020). Leadership empowering behavior emphasizes that employees share information and rights to gain opportunities to participate in decision making, strengthen their intrinsic motivation and stimulate their innovative behavior. In addition, leadership empowering behavior can enhance employees' sense of belonging and commitment to the organization (Chung et al., 2011; Kundu et al., 2019) and improve their satisfaction at work, influencing them to think about the organization as much as possible, thereby improving their work performance (Chang, 2016; Idris et al., 2018; Gong et al., 2021) and generating increased innovation behavior. This outcome is conducive to an organization to generate other innovative activities (Kool and Dirk, 2012; Li et al., 2016). Therefore, this research examines the influence of leadership empowering behavior on employees' innovation behavior from three aspects, that is, personal development support, participative decision making and delegation of authority, and proposes the following hypotheses:

> *H1*: Personal development support has a significant positive influence on innovation behavior.
>
> *H2*: Participative decision making has a significant positive influence on innovation behavior.
>
> *H3*: Delegation of authority has a significant positive influence on innovation behavior.

The literature on employee innovation points out that participative decision making and personal development support are important prerequisites for generating innovative results (Amabile et al., 2004; Khan et al., 2021). Based on this idea, Amabile et al. (1996) found that leaders' empowering behavior can give employees increased decision-making power and opportunities to make choices by delegating rights to employees and enabling them to make decisions and take action without direct supervision or intervention. This approach can encourage and empower employees to explore various creative solutions before determining feasible solutions and improve the output efficiency of innovation results. Zhang and Bartol (2010) conducted an empirical analysis to verify the influence of leadership empowering behavior on employees' innovation behavior and determined that leadership empowering behavior can increase employees' enthusiasm to solve problems, give them considerable freedom, stimulate their creativity and promote their innovation.

At the same time, social exchange theory asserts that leaders can establish high-quality reciprocal exchange relationships with employees through delegation of authority, personal development support, encouragement to participate in decision making and work guidance, which can promote employees' positive behavior and generate positive results for the organization (Erkutlu and Chafra, 2015). Therefore, based on the literature on leadership empowering behavior and social exchange theory, this study divides leadership empowering behavior into three dimensions, that is, personal development support, participative decision making and delegation of authority, and proposes the following hypotheses:

> *H4*: Participative decision making has a significant positive influence on personal development support.
>
> *H5*: Participative decision making has a significant positive influence on delegation of authority.

Thriving at work is a psychological state of an employee and obtained through learning and by experiencing vigor at work. Learning refers to the enhancement of self-confidence and strength through knowledge and skills, and vigor represents employees' high level of energy at work (Amabile, 1988; Spreitzer et al., 2005; Endrejat, 2021). Empowering leadership can help employees build confidence, encourage them to try new methods and promote continuous learning (Fry et al., 2005; Hirak et al., 2012; Meng, 2016). In addition, empowering leadership invites employees to participate in corporate management decisions and allows them to express different opinions, thereby giving them sufficient rights to solve problems and increasing their enthusiasm for work. Furthermore, empowering leadership pays attention to employees' sense of happiness at work and enhances their sense of belonging by satisfying their communication and emotional needs, thereby improving their work vigor (Sorakraikitikul and Siengthai, 2014; Lei et al., 2021). Employees' self-confidence, work autonomy and sense of belonging are conducive to stimulate their sense of thriving at work.

Employees' innovative and proactive behaviors have obvious characteristics based typically on a positive and optimistic work attitude, and thriving at work reflects employees' positive emotional state. When employees experience positive emotions generated through learning and vigor at work, they will deeply ponder their activities and promote the generation of innovative ideas (Jiang et al., 2020). Employees promote the construction of their resource system and innovation behavior through learning and by maintaining vigor at work (Isgett and Fredrickson, 2004; Saxena et al., 2020). Therefore, when employees have a high sense of thriving at work, they will have a strong desire to gain new knowledge and skills and will be able to use new methods and technologies in various ways to engage in challenging work and adapt to the dynamic needs of their organization (Guan and Frenkel, 2020). Employees with a high sense of thriving at work tend to spread new knowledge and skills in the organization and expend a considerable amount of energy on practice, which can promote their innovation performance. When employees have a sense of thriving at work, they can improve their innovation ability through active learning and by maintaining their vigor and demonstrate innovative proactive behavior exceeding the requirements of their work (Lee and Lee, 2020). Therefore, this study proposes the following hypotheses:

> *H6*: Delegation of authority has a significant positive influence on vigor.
>
> *H7*: Vigor has a significant positive influence on innovation behavior.
>
> *H8*: Learning has a significant positive influence on innovation behavior.

The effect of empowering leadership on employees' personal development support will enhance employees' intrinsic motivation and willingness to engage in complex, creative, proactive and self-directed activities (Frascaroli et al., 2015). In addition, it can enhance sense of effectiveness of employees' role width perception, increase their confidence in performing comprehensive tasks outside of work and improve their proactive work performance (McDonald et al., 2012; Zhang et al., 2021a). In the process of participating in decision making, employees will sense their leaders' support for their personal development (Band et al., 2019). Based on this concept, this study proposes the following hypothesis:

> *H9*: Personal development support has a significant moderating effect on the relationship between participative decision making and innovative behavior.

Research methodology

Sampling and data collection

This study uses a questionnaire survey to conduct empirical research and collect data, with industrial workers in China as the research object. The employees selected for this study refer mainly to technical employees, junior managers, middle managers, senior managers and employees engaged mainly in product design, research and development and testing. Such employees are the main members of enterprise innovation and play an important role in an enterprise. According to unified standards and requirements, the questionnaire is mainly distributed online through the WenJuanXing (WJX) data collection platform. WJX is an online research platform based in Changsha, China. With questionnaires, the platform collects data for economic management, psychology and education; provides powerful data storage and analysis functions; and digs deeply into the value of the data. Provide convenient data collection tools for scientific researchers.

In this survey, a total of 415 questionnaires are distributed, and 290 valid questionnaires are obtained, with an effective rate of 70%. The descriptive statistics show that in the effective sample, the male respondents account for 45.9%, and the female respondents account for 54.1%. For the age distribution, the respondents 25 years old and below account for 33.4%, those between the ages of 26 and 35 years account for 45.2%, those between the ages of 36 and 45 years account for 16.2% and those 46 years old and above account for 5.2%. The unmarried respondents account for 60.3%, and the married respondents account for 39.7%. Those employed for less than 2 years account for 24.8%, and those employed for 2 to 5 years account for 26.6%. The respondents employed for 6 to 9 years account for 23.4%, and those employed for over 10 years account for 25.2%. For the education distribution, the respondents who reached junior college and below account for 19%, those with a bachelor's degree account for 70%, those with a master's degree account for 7.9% and those with a doctoral degree and above account for 3.1%. For job distribution, technical staff account for 32.1%, junior management staff account for 35.5%, middle management staff account for 27.6% and senior management staff account for 4.8%. The respondents with an income below RMB 4,000 account for 21%, those with an income of RMB 4,001–5,000 account for 16.2%, those with an income of RMB 5,001–6,000 account for 11%, those with an income of RMB 6,001–7,000 account for 9.7%, those with an income of RMB 7,001–8,000 account for 14.5% and those with an income of RMB 8,000 or more account for 27.6%. The basic information of the survey object is shown in Table 1.

Questionnaire and measurements

The measurement questionnaire is based mainly on mature scales, On the basis of the research results of scholars, 18 influencing factors of employee innovation behavior were extracted from the literature, and the initial measurement scale was formed. and the research design is carried out in strict accordance with the translation-back translation procedure. On this basis, appropriate adjustments are made according to the Chinese context. In order to verify and supplement the existing research, representative enterprises were selected for in-depth interviews. Firstly, We state the understanding of relevant scholars on the connotation, extension and influencing factors of employee innovation behavior, and ask them to explain whether the existing research results can be established in the enterprise based on the actual situation of the enterprise. Through interviews, the factors extracted from the literature were confirmed in the enterprise.

TABLE 1 Demographic characteristics of valid sample.

Variables	Categories	Frequency	Percentage
Gender	Male	133	45.9%
	Female	157	54.1%
Age	25 years and below	97	33.4%
	26–35 years	131	45.2%
	36–45 years	47	16.2%
	46 years and above	15	5.2%
Marital status	Unmarried	175	60.3%
	Married	115	39.7%
Years employed	2 years and below	72	24.8%
	2–5 years	77	26.6%
	6–9 years	68	23.4%
	10 years or more	73	25.2%
Education level	Junior college and below	55	19.0%
	Bachelor’s degree	203	70.0%
	Master’s degree	23	7.9%
	Doctoral degree	9	3.1%
Position	Technician	93	32.1%
	Junior management	103	35.5%
	Middle management	80	27.6%
	Senior management	14	4.8%
Title	Junior	134	46.2%
	Middle	125	43.1%
	Subsenior	23	7.9%
	Senior	8	2.8%
Monthly income	RMB 4,000 and below	61	21.0%
	RMB 4,001–5,000	47	16.2%
	RMB 5,001–6,000	32	11.0%
	RMB 6,001–7,000	28	9.7%
	RMB 7,001–8,000	42	14.5%
	RMB 8,000 and above	80	27.6%

Based on this interview, a presurvey is conducted, and the questionnaire is revised and improved based on the presurvey feedback to create the formal questionnaire, except for the basic situation of the staff. In addition, the influence of leadership empowering behavior and thriving at work on employees’ innovation behavior is investigated. The questionnaire uses a seven-point Likert scale, with 1 representing “completely disagree” and 7 representing “completely agree”.

The questionnaire is revised based on the leadership empowering behavior scale compiled by Arnold et al. (2000), Konczak et al. (2000), Slåtten et al. (2011), Hassi (2019), Naqshbandi et al. (2019) combining the characteristics of employees’ innovation behavior. Based on the feedback and presurvey results, three items, that is, *Personal Development Support*, *Participative Decision Making* and *Delegation of Authority*, are determined (Mutonyi et al., 2020). This study draws on the scale of Shirom (2003), Porath et al. (2012), Duan et al. (2021) to create the vigor and learning. Moreover, this study draws on the scale of Porath et al. (2012), Spreitzer et al. (2012), Spanuth and Wald (2017) to measure employees’ innovation behavior. The last measurement items of the five constructs are listed in the Appendix.

Extraction of main factors

Numerical KMO calculation and Bartlett spherical test were performed for sample data. The KMO value of the scale was 0.909, indicating that the sample adequacy was high and suitable for progressive factor analysis. The x^2 value of Bartlett spherical test was 1637.339 (153 degrees of freedom), and the accompanying probability was 0.000, less than 0.05, indicating that there was correlation between the items of the scale, which was suitable for factor analysis.

The principal component analysis method was used to extract the main factors, and the factors with eigenvalue greater than 1 were selected. The maximum variance method was used to rotate the factors, and the items that were self-contained as one factor and the load values of two or more factors were all less than 0.5 were deleted. Two factor analyses were conducted. A total of 5 items were deleted, namely QPDS3, QPDS5, QTW3, QTW4 and QTW5. After the items were deleted, the KMO value of the scale was 0.896, the x^2 value of Bartlett spherical test was 1209.206 (with 78 degrees of freedom), and the accompanying probability was 0.000, less than 0.05. It shows that there are common factors among the correlation matrices of the mother, indicating that the data are suitable for factor analysis. A total of 4 factors are extracted, and the cumulative variance contribution rate is 51.975%, which can explain most of the structure of the original variable and reflect most of the information of the original variable. Thus, four main factors of influencing factors of employee innovation behavior are obtained. Exploratory factor analysis was completed.

Reliability and validity tests

Cronbach's α reliability coefficient was used to test the internal consistency of the scale. After deleting 5 items, the Cronbach's α coefficient of the scale as a whole was 0.870, indicating that its reliability and stability were good and its reliability was high. The Cronbach 'α of the four subscales is greater than 0.6, indicating that they also have good reliability.

This study uses SPSS 24.0 to test the reliability and validity of *Personal Development Support*, *Participative Decision Making*, *Delegation of Authority*, *Vigor, Learning* and *Innovation Behavior*, and the results are presented in Table 2. It can be seen from Table 2 that the composite reliability (CR) of each latent variable is greater than 0.75, and the Cronbach's α coefficient values are all greater than the recognized lowest level of 0.6, thereby indicating that the scales demonstrate satisfactory reliability. Exploratory factor analysis is used to test the structural validity of the scales, and the factor loading of each item corresponding to all the variables is greater than the threshold of 0.7, thereby indicating that the scales have satisfactory structural validity (Nunnally, 1978).

The AVE of each variable is greater than 0.5, thereby indicating that the scales have satisfactory convergent validity (Fornell and Larcker, 1981). Combining Table 3, the square root of the AVE of each variable is greater than the correlation coefficient between the variable and the other variables. The variables exhibit satisfactory discriminant validity, which shows that the scales used in this paper demonstrate satisfactory validity (Hair et al., 1998).

Data analysis and results

Partial least squares (PLS) are used to analyze the model. This technique is a new type of multivariate data analysis method, with more reliable and stable calculation results compared with other methods. In addition, this method is suitable for analyzing small data samples and can simultaneously realize modelling prediction, the comprehensive simplification of multivariable systems and correlation analysis between two sets of variables, which can effectively solve the problem of collinearity. The main purpose of this method is to build a regression model between multiple dependent and independent variables (Chin et al., 2020). Moreover, when

TABLE 2 Reliability analysis.

Construct	Items	Factor Loading[a]	Cronbach's α	CR	Average Variance Extracted (AVE)
Personal development support (PDS)	PDS1	0.761	0.738	0.836	0.560
	PDS2	0.771			
	PDS3	0.738			
	PDS4	0.723			
Participative decision making (PDM)	PDM1	0.783	0.763	0.849	0.584
	PDM2	0.759			
	PDM3	0.779			
	PDM4	0.735			
Delegation of authority (DOA)	DOA1	0.744	0.715	0.839	0.636
	DOA2	0.874			
	DOA3	0.769			
Vigour (VI)	VI1	0.883	0.715	0.875	0.778
	VI2	0.881			
Learning (LE)	LE1	0.718	0.551	0.769	0.526
	LE2	0.700			
	LE3	0.758			
Innovation behavior (IB)	IB1	0.754	0.616	0.795	0.565
	IB2	0.739			
	IB3	0.761			

constructing the model, PLS can set the external relationship type in the structural equation flexibly according to the actual situation, that is, it supports the constitutive model and reflective model (Richter et al., 2020). SmartPLS 3.0 is used in this study to analyze the model.

Path coefficient and hypothesis test

The path coefficient indicates the strength of the relationship between the independent and dependent variables (Thom, 1983). The results of the path coefficient analysis of the study model are presented in Figure 1 and Table 4. All seven hypotheses are supported.

R^2 is the variance variability explained by the dependent variable. In this study, the bootstrapping repeated sampling method is used to select 3,000 samples to calculate the *t*-value of the significance test. The interpretation degree of *Personal Development Support*, *Delegation of Authority* and *Innovation Behavior* is 0.393, 0.351 and 0.395, respectively, thereby indicating that the model has a satisfactory interpretation effect.

In this study, the bootstrapping method is used to test the significance of the path coefficients of the structural model, and the results are shown in Table 4. The effect of *Personal Development Support* on *Innovation Behavior* is unverified ($\beta = 0.073$, $t = 1.069$), thus, H1 is unconfirmed. *Participative Decision Making* has a significant positive influence on *Innovation Behavior* ($\beta = 0.396$, $t = 4.925$), thereby supporting H2. The effect of *Delegation of Authority* on *Innovation Behavior* is unverified ($\beta = -0.051$, $t = 0.852$); thus, H3 is unconfirmed. *Participative Decision Making* has a significant positive influence on *Personal Development Support* ($\beta = 0.630$, $t = 16.204$), thereby supporting H4. *Participative Decision Making* has a significant positive influence on *Delegation of Authority* ($\beta = 0.595$, $t = 14.421$), thereby supporting H5, and *Delegation of Authority* has a significant positive effect on *Vigor* ($\beta = 0.326$, $t = 5.595$), thereby supporting H6. *Vigor* has a significant positive effect on *Innovation Behavior* ($\beta = 0.326$, $t = 4.714$), thereby supporting H7. *Learning* has a significant positive effect on *Innovation Behavior* ($\beta = 0.258$, $t = 4.606$), thereby supporting H8.

TABLE 3 Validity analysis.

	Personal development support	Innovation behavior	Participative decision making	Learning	Delegation of authority	Vigour
Personal development support	0.748					
Innovation behavior	0.483	0.751				
Participative decision making	0.627	0.550	0.764			
Learning	0.458	0.500	0.390	0.726		
Delegation of authority	0.469	0.325	0.593	0.255	0.798	
Vigour	0.504	0.476	0.446	0.379	0.324	0.882

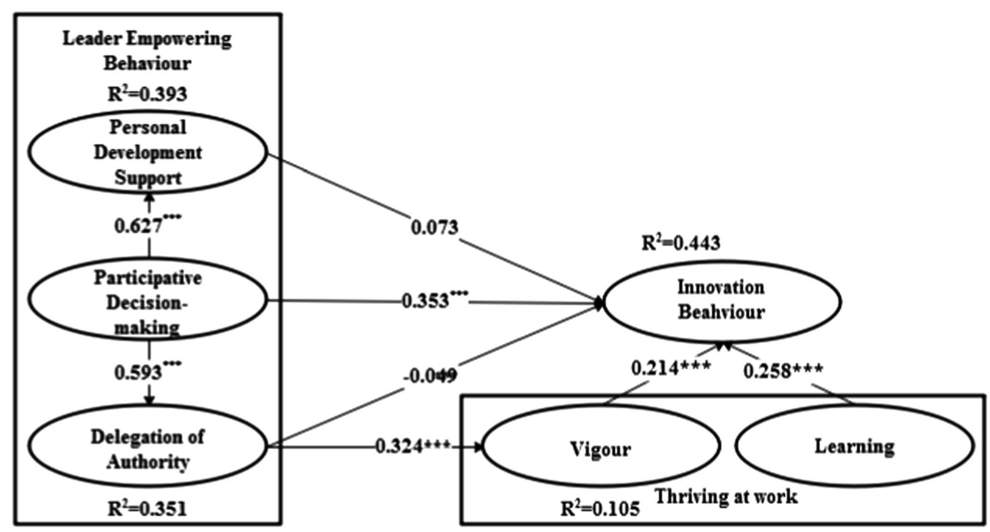

FIGURE 1
Model path and significance level.

TABLE 4 Hypothesis testing results.

Hypothesis	Path	Mean	SD	*t*-value	*p*	Supported
H1	PDS → IB	0.071	0.068	1.069	0.285	No
H2	PDM → IB	0.355	0.082	4.279	0.000	Yes
H3	DOA → IB	−0.046	0.064	0.762	0.446	No
H4	PDM → PDS	0.630	0.039	15.897	0.000	Yes
H5	PDM → DOA	0.595	0.040	14.647	0.000	Yes
H6	DOA → VI	0.328	0.057	5.674	0.000	Yes
H7	VI → IB	0.212	0.057	3.750	0.000	Yes
H8	LE → IB	0.263	0.056	4.606	0.000	Yes

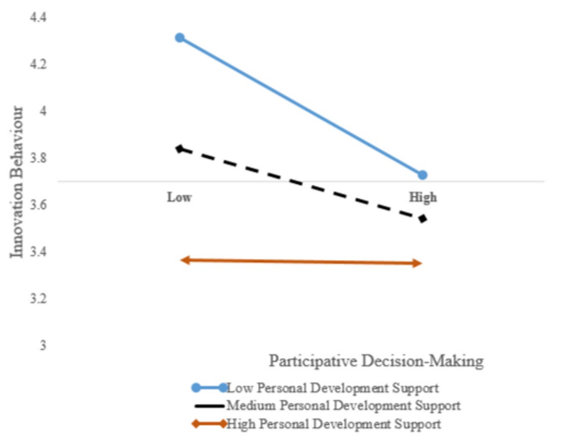

FIGURE 2
Moderating effect of *Personal Development Support* on the relationship between *Participative Decision Making* and *Innovation Behavior*.

Moderating effect test

To test the moderating effect of *Personal Development Support* on the relationship between *Participative Decision Making* and *Innovation Behavior*, hierarchical regression analysis is employed. This study investigated the role of variables at the level of Personal development support and Participative decision-making on the dependent variable. On this basis, it continues to investigate whether the variable Participative decision-making will affect the slope between the independent variable and the dependent variable at the Personal development support level, so as to obtain the slope prediction model, namely the full model.

Before verifying the moderating effect, centralising the variables of the cross terms to avoid collinearity is necessary. Next, the variables processed through centralization are multiplied to construct the interactive items. In this study, the independent and adjusted variables are processed centrally to construct the product terms of *Personal Development Support* and *Participative Decision Making* with *Innovation Behavior* for the multilevel regression analysis. *Personal Development Support* has a significant regulatory effect on the relationship between *Participative Decision Making* and *Innovation Behavior*. In the study, *Personal Development Support* is divided into high, medium and low conditions, which can facilitate the clear display of the role of the regulatory variables. Excel is used to plot the degree of influence of *Participative Decision Making* on *Innovation Behavior* in the high, medium and low conditions of *Personal Development Support*. The main effect (*Participative Decision Making*) is −0.15, the moderating variable effect (*Personal Development Support*) is −0.331 and the moderating effect (*Participative Decision Making* × *Personal Development Support*) is 0.143, $p = 0.023$. The moderating effect is shown in Figure 2, and the results reveal that when *Personal Development Support* is high, the influence of *Participative Decision Making* on *Innovation Behavior* increases, thereby supporting H8. Personal development support has a significant moderating effect on the relationship between participative decision making and innovative behavior.

Discussion and conclusion

Discussion of findings

This study analyses the factors influencing employee innovation behavior from two aspects, namely, leadership empowering behavior and thriving at work. The following key conclusions are drawn.

Firstly, the personal development support and participative decision making dimensions of leadership empowering behavior have a significant positive influence on employees' innovation behavior, but the influence of delegation of authority on employees' innovation behavior is unconfirmed. The conclusions of this study indicate that companies should gradually shift their leadership style from centralization to authorization. Leadership empowerment can help employees share increased resources (Soliman, 2020); make employees feel the support, attention and encouragement of the company; and enhance their sense of belonging and loyalty, thereby improving their sense of innovation self-efficacy and further stimulating their innovation behavior (Cheong et al., 2019). Therefore, under a stable corporate organizational structure, leadership empowerment is conducive to corporate development.

Secondly, thriving at work has a significant positive influence on innovation behavior. This outcome shows that vigor and learning can influence employees' creativity and help them form, maintain and develop their creativity. According to componential theory of creativity, ability, knowledge and motivation are the key internal components of creativity (Rukhsar, 2015). Employees with a high sense of thriving at work have a high level of knowledge, vigor and energy. Through continuous learning and by honing and improving their professional abilities and skills, employees can generate innovative ideas (Gundry et al., 2016).

Thirdly, the participative decision making dimension of leadership empowering behavior has a significant positive influence on personal development support and delegation of authority. At the same time, delegation of authority has a significant positive influence on vigor. The research conclusions show that the participative decision making dimension of leadership empowering behavior can satisfy employees' sense of participation. By participating in the company's decision making, employees' dominant position is respected, and increased psychological capital is obtained (Erkutlu and Chafra, 2015; Wu and Chen, 2015). In the process of participating in decision making, employees can easily obtain support from their leaders for their personal development by providing reasonable suggestions and innovative ideas (Wu and Chen, 2015). When employees are adequately capable, leaders will consider granting rights and appointments to facilitate increased innovative work.

Finally, personal development support has a significant moderating effect on the relationship between participative decision making and innovative behavior.

The analysis finds that the relationship between employees' participative decision making and innovation behavior is affected by personal development support. When leaders' support for employees' personal development is high, it can stimulate employees' enthusiasm for work (Huo and Jiang, 2021), thereby encouraging them to participate actively in the development of the enterprise, express practical innovation views and provide innovation experiences and innovation models for the innovation and development of the enterprise (Kremer et al., 2019) and enhancing the overall innovation atmosphere of the enterprise and employees' innovation behavior.

Practical implications

The important insights of this research into the practice of business management mainly include the following aspects.

Firstly, leadership is one of the most important factors influencing employees' innovation behavior. This study confirms the positive effect of leadership empowering behavior on employees' innovation behavior and provides certain insights into how leaders can improve subordinates' innovation through their own actions (Tian et al., 2015). In an enterprise, leaders must first determine the quality of the employees, confirm that their quality can match the power granted them and avoid abuse and waste of power that employees are unable to master. To stimulate employees' innovation behavior, leaders must master the art of empowerment and delegate authority appropriately to enable employees to complete their work independently, understand the importance of responsibility and gain power whilst performing their corresponding obligations. Leaders must also regard employees' development as the organization's development and work as hard as possible to realize their value.

Secondly, leaders should focus on helping employees grow when they stimulate employees' innovation behavior through their empowering behavior, such as helping them plan and ensure their career path. Leaders should constantly pay attention to employees' work progress to prevent them from losing self-control after gaining decision-making power, which may cause delays, deviations and other consequences. An organization's strategy and vision are decomposed into strategies at every level and conveyed correctly to subordinates to prevent them from deviating from the general direction of the organization and acting contrary to the organization's expectations, thereby allowing them to participate in the organization's decision-making process, especially in decisions related closely to themselves, such as the establishment of work goals for the following quarter, work standards and so on. Finally, leaders should communicate and maintain close contact with employees at all times to ensure the normal flow of information. This correct exercise of empowering behavior can expand employees' resources and enhance their work, overall planning and leadership abilities. When employees are grateful and give back to the organization, they demonstrate increased innovation behavior, which will benefit the organization.

Thirdly, thriving at work has a substantial influence on employees' innovation behavior. In management practice, leaders must pay attention to employees' learning and growth and promote their learning and vigor. With the rapid development of science and technology, whether enterprises can advance is the key to their survival. The development of an enterprise is based on the development of its employees; thus, employees' individual learning is directly related to the competitive advantage of the organization. This research confirms the correlation between thriving at work and innovation behavior. Employees can trigger their increased innovation behavior by mastering new knowledge and technology or continuously gaining and integrating existing knowledge and technology. Therefore, leaders should adopt other leadership methods that encourage employees to participate in decision making, guide and help employees and share information to stimulate employees' vigor and learning behavior. At the same time, leaders and human resource departments should pay attention to guiding and promoting employees' learning behavior in a variety of ways, such as training in the latest knowledge of the industry, knowledge sharing meetings within the organization, regular basic knowledge and skills examinations, inviting internal and external lecturers to teach employees and so on to establish a learning organization, create a positive environment for employees' learning behavior, increase the availability of learning resources and help employees produce increased innovation behavior at work.

Theoretical implications

Through the discussion, research and verification of the relationship between leadership empowering behavior, thriving at work and employees' innovation behavior, this study makes the following theoretical contributions.

Firstly, most studies on leadership empowering behavior explored employees' perception and proved that leadership empowering behavior can promote employees' positive behavior (Javed et al., 2018). However, this research angle is broad, and the focus is narrow. This study is based on existing research results on personal development support, participative decision making and delegation of authority and analyses the influence of leadership empowering behavior on employees' innovation behavior. Moreover, this study further explores the internal mechanism between the three dimensions, which enriches research in the field of not only leadership empowering behavior but also innovation to a certain extent.

Secondly, thriving at work is a positive human and social capital. This study introduces thriving at work into research on the relationship between leadership empowering behavior and employees' innovation behavior, thereby verifying the influence of thriving at work on employees' innovation behavior and proving the positive influence of delegation of authority on thriving at work (Basharat et al., 2018). In addition, this study enriches the theoretical basis of previous research on employees' sense of thriving at work.

Thirdly, personal development support has a positive effect on employees' innovation behavior and a significant moderating effect on the relationship between participative decision making and innovation behavior. This study introduces personal development support and examines its moderating effect, expands the boundary conditions of leadership empowering behavior and deepens understanding of the relationship between leadership empowering behavior and employees' innovation behavior. Furthermore, this study enriches the theoretical basis of the mechanism of the leadership behavior style affecting employees' innovation behavior.

Limitations and future research directions

Although this research achieved certain results, deficiencies remain in some aspects. Firstly, the sample is limited. The majority of the sample is from China, and the depth and breadth of the sample are inadequate. In future studies, researchers should expand the research scope to other regions, increase the number of research enterprises, enrich the industry type, reduce the sample measurement errors and improve the reliability of the research conclusions. Secondly, this study explores only the influence of leadership empowering behavior on employees' innovation behavior at the individual level. However, employees' innovation behavior is also closely related to the organizational level and team level. In future research, increased consideration should be given to the influence of factors at other levels. Thirdly, the measurement scales used in this research are mature, but some adjustments were made in the specific application process, and the understanding of some issues is shallow, which may have a certain influence on the effectiveness of the research results. From the perspective of research method, The disadvantage of cross-sectional design is the lack of systematic and continuity. Because in cross-sectional design, each person is only examined at a certain point in time, it is impossible to obtain the data of individual development trend or development change. There is no continuity in the development of the same individual; Age and birth date cannot be distinguished; The sampling is complicated. Cross-sectional design at the same time has a cohort effect on subjects of different ages (Spector, 2019). In future studies, increased attention should be paid to adjusting and revising the scales based on specific cultural backgrounds to obtain accurate results and enhance the validity and persuasiveness of the conclusions.

Data availability statement

The datasets presented in this study can be found in online repositories. The names of the repository/repositories and accession number (s) can be found in the article/ Supplementary material.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent from the participants was not required to participate in this study in accordance with the national legislation and the institutional requirements.

Author contributions

PY: data curation, formal analysis, methodology, writing—original draft, and writing—review and editing. LL: data curation, methodology, and writing—original draft. JT: data curation, writing—review and editing. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Appendix

Personal development support

1. My supervisor is very concerned about my personal growth and career plans.
2. My supervisor often provides me with training and learning opportunities.
3. My supervisor will try to get me promoted because of my outstanding job performance.
4. My supervisor often creates opportunities for me to show up and exercise.

Participative decision making

1. When encountering problems at work, my supervisor actively listens to my opinions and suggestions.
2. When making decisions, my supervisor respects and values my suggestions.
3. My supervisor often creates opportunities for me to fully express my opinions.
4. In terms of my work and personal situation, my supervisor will ask for my opinion before making a decision.

Delegation of authority

1. My supervisor does not interfere with the work within my scope of authority.
2. My supervisor is fully authorised to let me take full responsibility for the work I undertake.
3. My supervisor authorises me to make independent work decisions.

Vigor

1. I am full of vigour at work.
2. I am often energetic at work.

Learning

1. As time goes on, I learn more and more knowledge.
2. I think I'm constantly improving at work.
3. I can get more development in my job.

Innovation behavior

1. I will facilitate the exchange of innovative ideas within the organization.
2. I will guide important people in the organization to become interested in innovative ideas.
3. I will turn innovative ideas into actual practices.

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The influence of differential leadership and proactive personality on employee in-role performance: An integrated model

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Purpose: Differential leadership does not necessarily bring only negative effects, as it may also become an incentive management strategy. This study explores whether outsiders can actively become insiders through proactive personality traits, or whether they can actively approach resource controllers to remove obstacles at work and enhance their performance in a Chinese cultural setting.

Methodology: A stratified random sampling method was used. The sample objects were medical staff from hospitals in the six urban districts of Beijing. In 2021, a total of 900 online questionnaires were distributed. 524 valid questionnaires were recovered.

Main findings: The results show that differential leadership, defined as favoritism towards insiders and prejudice against outsiders, can cause changes in employees' sense of organizational justice and in-role performance. Meanwhile, by introducing 'proactive personality' as an independent variable that also acts as a moderator, our study confirms that, under differential leadership, employees with a proactive personality can actively improve situational barriers and have better work performance.

Implications/applications: Our research offers managers the following advice: First, it is better to look not only at relationships, but also to understand an employee's personality characteristics, whether it has a superficial or deep role at work, in order to reduce the turnover rate and to raise productivity. Second, it is important to teach employees to serve customers with a sincere appreciation of their point of view, rather than focusing on presenting an outward appearance of friendliness.

Novelty/originality: This paper contributes to the theory of proactive personality, emotional labor, and differential leadership. Contrary to previous studies, our research has used 'proactive personality' as both a distractor and a predictor at the same time. Also, insiders favored by leaders are not found to perform better at work.

KEYWORDS

proactive personality, differential leadership, organizational justice, emotional labor, employee in-role performance

Introduction

Strengthening relationships between differential leadership (DL) and "insiders" and "outsiders" (IO) has become a crucial task for organizations, because high-level talent has become enterprises' core competitiveness. Good employee performance and attitudes not only help an organization improve efficiency, but also promote the organization's innovational development and endogenous motivation (Jha and Kumar, 2016). However, due to different cultures and leadership styles, it is inevitable that members, with a large amount of key information and under the action of certain factors, may exhibit negative behaviors in the workplace, thereby affecting their in-role performance (Ghosh et al., 2017). This not only adversely affects the careers of members within the organization, but also harms the organization and damages its legitimate interests. According to a famous Confucius classic, *Book of Rites · Moderation*, the interaction between people should follow the norms of respect and inferiority, closeness and distance, etc. In other words, respect accorded to wise men varies according to different levels and regions, and there is an order of differences even among relatives. To the present day in Chinese social culture, the valuation of these two norms of respect-and-inferiority and of closeness-and-distance, have formed behavior patterns and communication rules (Zheng, 2006).

The importance of DL and IO in an organization has been previously verified, but few studies on these issues have adopted a "proactive personality" perspective. "Proactive personality" in employee performance is particularly important because the leader has the power to promote employees and allocate resources, and because employees must rely on the leader's instructions to perform their work. Employees in a positive atmosphere have generally good expectations of their leaders. Employees can be frustrated, however, if the leadership style of their superior is inconsistent with the inner expectations of the employees (for example, these employees may see inequities, such as those outside the circle relying on relationships to assign tasks, or managers deliberately hindering employees from completing tasks, or differential leadership giving unfair compensation and promotion opportunities). Especially, when such emotions are not addressed, employees will show a bad work attitude, in part as a way to release their feelings of unbalanced effort and reward. When this situation persists, it becomes a burden to the organization; the overall atmosphere becomes discordant, management instructions cannot be implemented, and grassroots advice cannot reach the top, which can result in the company's poor operation and failure. In such a situation, how can this management drawback be solved, or how can leaders adopt a more positive incentive strategy?

Data-driven artificial intelligence tools are becoming increasingly more powerful. With stronger capabilities, the utilization of AI technology is expected to boost the world economy (Kliestik et al., 2020; Durana et al., 2021; Lazaroiu et al., 2021; Valaskova et al., 2021). It will have a great impact on enterprises' added value production (Mitan et al., 2021). Facing a new era and a knowledge-based economy, key elements such as knowledge capital, good corporate governance, and superior-subordinate partnership will be essential for a sustainable business operations (Bulathsinhalage and Pathirawasam, 2017; Xu and Liu, 2020; Krulicky and Horak, 2021; Tijani et al., 2021).

In traditional Chinese culture, leaders have wide-ranging decision-making and discourse power, due to the cultural acceptance of a higher power differential (Wang and Guan, 2018). Leaders tends to divide their subordinates into "insiders" and "outsiders" according to their relationships with them, and then to adopt differentiated management. Sexton et al. (2018) note that employees who have a closer relationship with their leaders may enjoy more resources and opportunities in the organization. Leaders are more active in interacting with "people inside the circle," and most of them entrust more heavy responsibilities to the insiders and take care of them privately. In response, these insiders may feel that they are more valued and have a deeper sense of gratitude, which may enhance their sense of loyalty to the leader and their commitment to work. This not only improves their own in-role performance, but also creates more benefits and value for the organization. Moreover, the closer these insiders are to their leader, the more they may feel the difference between themselves and other members. Leaders are more rigid with "outsiders" and share less information with them (Kang and Cheung, 2010; Persson and Zhuravskaya, 2016). If the leader's insiders and outsiders disagree on role identification, it will directly affect the quality of their interactions.

Owing to its being a highly professional and specialized service, medical care contains a large degree of emotional exposure, especially in nursing work between patients and practitioners, so it requires workers to make particular efforts to control their emotions. Therefore, this service sector can be viewed as an emotion-intensive industry (Ashforth and Humphrey, 1993; Wang and Li, 2011). In particular, the emotional labor of employees in the nursing sector has increasingly become an issue that organizational management attaches great importance to. For example, workers might have accumulated grievances at work for various reasons, but due to job responsibilities and requirements, they need to control their emotions and continue to "serve with a smile." In other words, in order to maintain a proper appearance and state of mind in the work environment, one must buildup oneself psychologically, control negative emotions, and give appropriate feedback to the behavior object (Burns et al., 2019).

The goal of this study is to explore whether a differential leadership style is beneficial to employees' self-motivation and whether organizational differential motivation will affect performance within roles. Some scholars believe that a differential leadership style does not necessarily only bring negative effects, as it is likely to become an incentive management strategy (De Hoogh et al., 2015). This paper assumes that when leaders classify their subordinates according to standards such as ability and dedication, those "outsiders" who possess a proactive personality may generate some sort of insider status and actively approach the resource controllers. Because employees' work attitudes and behaviors are affected by the employee-leader relationship, employees who can obtain more resources from leaders will show more enthusiasm. Therefore, employees with a proactive personality consciously improve their work ability, actively change their personal communication behavior, and alter their organizational task environment.

This work contributes to the literature on differential leadership and employee in-role performance in several ways. First, concerning its contribution to theoretical development, previous research work on employee behavior, such as "abusive" and "destructive" leadership, examined the negative aspect of employee job performance. However, similar research on how the proactive personality trait affects the behavior of "outsiders" has not been conducted for a Chinese working environment operating under the theory of differential leadership. Thus, this research offers a theoretical extension to a blank area in the current literature.

Second, concerning its contribution to finding practical application in the context of Chinese localization, we have explored the impact of differential leadership on employees. Since role performance depends on the individual's self-construction (Turban et al., 2017), adding "proactive personality" as a factor generates a differential incentive strategy and stimulates a "fighting spirit" among employees. This research can provide a reference for the service sector, as well as other related industries, to reduce the disadvantages of conventional differential management.

Third, previous studies have shown that differential leadership does affect employees' negative behavior. However, our research finds that, as long as differential patterns and partiality are rationally utilized, both "insiders" and "outsiders" can be encouraged to search for their own psychological balance when workers feel fairness is upheld (i.e., meeting their psychological expectations), by changing their workplace behavior and thus promoting the healthy development of the enterprise.

Fourth, in addition to introducing fairness perception as a mediator, this paper also adds "emotional labor" and "proactive personality" as moderator variables. From the perspective of employees' own feelings and proactive changes, we explore how, under the influence of differential leadership, emotional labor and proactive personality restrain negative effects and generate a kind of motivational effect. This finding may provide some new insights for managers.

Research questions

Salas-Vallina et al. (2021) pointed out that effective management can increase the effectiveness of subordinates for the benefit of the organization. Employees, in response to the style of leadership they receive, can take actions against situational obstacles through their own perceptions and self-management, which is particularly the case for individuals with proactive personality (Bateman and Crant, 1993). Based on the social exchange theory (SET), we first aim to measure the effect of differential leadership style, upon the relationship between employee proactive personality and employee in-role performance We then explore whether the relationship between the two is positive under the influence of other variables, and whether the sense of organizational justice that is influenced by differential leadership can be used as an intermediary variable in this study. In addition, considering the relationship between employees in the inner circle and outside of it, how does differential leadership create different impacts on the in-role performance of employees?

Research gaps: Previous research work on differential leadership has mainly focused on whether loyalty and talent are good criteria for classifying leaders (Cheng and Lin, 1998; Ren et al., 2002), as well as on the impact of differential treatment by leaders on subordinate effectiveness (Asrar-ul-Haq and Kuchinke, 2016). Some studies have tried to detect whether organizational leaders have subordinates of their own (Farahnak et al., 2020). These studies generally found positive effects, although a few showed negative effects. Some works also include job performance (Aarons et al., 2017) and organizational commitment (Keskes et al., 2018). The previous literature on employee behavior identifies the primary positive employee behaviors as in-role behavior, socially beneficial behavior, and organizational citizenship behavior; the primary negative employee behaviors are identified as anti-productive behavior, deviant behavior, and abusive leadership. There is very little research work, however, that has actually considered the specific differential leadership associated with Chinese cultural characteristics. In this case, there are proactive personality traits, acting under different situations and individual perceptions that changed the behavior of "outsiders" as its antecedent variables. Therefore, to make the theory more complete, this paper also uses supplementary variables such as organizational justice and emotional labor.

Literature review and hypotheses

Social exchange theory

The earliest theory of social exchange was first proposed by Homans (1958). Its main assumption is that "people are rational" profit-seeking actors, who pay attention to the choice and pursuit of personal interests. In the process of interaction, their main concerns are how to measure the relative benefits between different purposes and actions, and how to conduct exchanges for the highest profit and repayment with the lowest possible cost. Agreements reached by people are the basis for maintaining and stabilizing interpersonal relationships, as well as all social organizations. However, since social exchange theory suggests that human behaviors are governed by the incentive to earn rewards and the desire to receive remuneration, all human social activities can be reduced to a kind of exchange. If so, the social relationship formed in social exchange can also be viewed as an exchange relationship.

Social exchange is part of human behavior. The microstructure of society originates from the exchanges that individuals expect from social rewards. The reason why individuals interact with each other is because they desire to get something from their reasonable exchanges (Erdogan and Enders, 2007). In this regard, social exchange is divided into three forms: (1) social exchange of internal rewards (such as fun, social approval, love, gratitude, etc.), in which the exchange actor takes the process of communication itself as the purpose; (2) social exchange of external rewards (such as money, goods, invitations, assistance, obedience, etc.), in which the exchange actor regards the process of interaction as a means to achieve farther goals (external remuneration provides an objective and independent standard for a person to reasonably choose partners, providing an objective and independent standard); and (3) mixed social exchange, in which actors receives both internal and external remuneration.

Different disciplines have influenced the formation of social exchange theory (SET): (1) Anthropology: Exchange and reciprocity are often the basis of social integration, in primitive tribes, kinship and marriage are an alliance system, and therefore, marriage exchange guarantees alliances and social integration;; (2) Economics: concepts such as compensation or punishment, cost and profit originate from economics; (3) Psychology: Psychological principles can not only explain individual behaviors, but also understand social structures and social changes. People are society, and people's lives are mostly in the process of interaction with others. All in all, the theory of social exchange is a combination of anthropology, economics, and behavioral psychology, and the interaction between people and the world is regarded as a rational behavior of calculating gains and losses. This idea is the same as that which our research has discussed – the inner and outer circles formed by differential leadership in Chinese culture may shape the differences in employee performance.

From the perspective of social exchange theory (SET), proactive personality is described as "a person who is not restricted by the environment, even if he is treated differently, he can make the environment change" (Bateman and Crant, 1993). Such a person can show initiative and positive work performance (Yang and Chau, 2016; Turban et al., 2017), strong learning motivation (Roberts et al., 2018) and innovative performance (Rodrigues and Rebelo, 2019). Newman et al. (2017) demonstrated that employees with strong proactive personalities are more likely to respond positively to leadership. Furthermore, people with a high level of proactive personality may actively engage in forming new initiatives, recognizing different opportunities, and persevering in achieving their goals (Bateman and Crant, 1993). Therefore, people with proactive personalities may challenge the status quo, while people with passive personalities usually maintain the status quo.

Factors affecting employee in-role performance

Social exchange theory argues that, when individuals conduct social exchanges, they will first judge their relationship with each other according to the "level of distance," as the basis and principle of communication or resource allocation (Cropanzano and Mitchell, 2005). Previous studies on in-role performance have focused on employees' own factors and situational factors (such as incentive policies, people-post matching, leadership, corporate social environment, internal working atmosphere, and opportunities in development). Vigoda (2000) defines in-role performance as behaviors related to employees' formal role requirements, which are basic job responsibilities and tasks specified in the job description; employees' performance of such behaviors will result in receiving material and spiritual rewards. Due to cultural differences and perceptions of roles, the division of in-role performance also varies across cultures (Blakely et al., 2005). In terms of employees' own factors, the employees' personal characteristics, cognition, attitude, and emotional experience can all be used as influencing factors of their in-role performance. Mindfulness has a positive impact on employees' in-role performance (Rodrigues and Rebelo, 2019; Jahanzeb et al., 2020); emotional instability will have a negative impact (Judge and Zapata, 2015; Probst et al., 2017); employee personality factors also interact with work stress, which in turn affects performance (Judge and Zapata, 2015). That is to say, competent employees see challenges as an opportunity, and this opportunity is likely to promote personal career development. In order to improve their in-role performance, employees will put in effort and complete tasks to a high quality, which will have a positive impact and their in-role performance will thus be raised. Feng et al. (2019) has shown that, with the increase of challenging stressors, the in-role performance of employees will show an inverted "U" change.

The impact of proactive personality on employees' in-role performance

Crant (2000) proposed that proactive behavior is actively transcending the current environment or create a new environment, with strong individual autonomy and purpose, as well as keen insight and an ability to seize opportunities. This paper explores the relationship with in-role performance from three perspectives: personal traits, behavioral perspectives, and action processes of proactive employees. People with proactive personalities have a higher ability to judge the situation. Because of an unwillingness to be restrained, in order to achieve their ideal state or get closer to their goals, this type of worker will actively improve the environment when the organizational situation hinders their interpersonal relationships and career development (Bateman and Crant, 1993). McCormick et al. also confirmed that "proactive personality" has a positive predictive task performance and organizational fairness in individuals with high Situational Judgment Effectiveness (SJE). On the other hand, if "proactive personality" is low, those individuals will not improve their environment or will be assimilated by that environment. The reason is that ability and flexibility are preconditions that determine behavior.

From the perspective of behavior and personal characteristics, employees with proactive personalities will hope to gain status in the organization, and will tend to be valued by leaders. In order to achieve their goals or obtain target resources, they will devote themselves to their work, match themselves to the organizational goals, and be responsible for the results of their labor. Therefore, individuals with proactive personality will change their behavior according to their environment and leadership relationships, will actively seek feedback, and will conduct self-management. They will also formulate plans and implement and anticipate future results. Propelled by high desire, their initiative will become stronger, and they will try to achieve their goals, thereby improving their personal effectiveness and promoting their in-role performance (Crant, 2000). In addition, from the perspective of action processes, the action-goal taken by employees with proactive personality traits is a dynamic process that is planned and expected to produce results, and is future-oriented. For example, when employees find opportunities in organizational activities, they will try to identify the opportunities and the experience needed to complete their task goals and will spend the time and effort needed to achieve their goals and tasks to a high standard and with creativity (Vermooten et al., 2019). In the context of team orientation, employees with proactive personalities are more driven (Turban et al., 2017). However, if employees with proactive personalities do not receive benefits from the organization despite their initiative, it may be due to a mismatch between their personal goals and their organizations' goals. Therefore, this paper proposes the following hypothesis:

> *H1*: Proactive personality has a positive effect on in-role performance.

The relationship among emotional labor, employee proactive personality, and in-role performance

In service positions in the medical sector, emotional labor is one of the most important work requirements (Hayyat et al., 2017). Morris and Feldman (1996) have shown that emotional labor is influenced by individual traits, situational factors, and sociocultural influences. They emphasized that emotional labor is influenced by the social environment and is a dynamic process. Three factors may affect emotional labor: (1) individual factors, such as gender, age, and personality traits; (2) organizational factors, such as organizational climate and work autonomy; and (3) situational factors, such as emotional events and communicative expectations (frequency, attitude, persistence, etc.). Delgado et al. (2017) believed that emotional labor research in the field of nursing is of great significance. Research shows that women are more likely to express their emotions, and they are more proficient than men in both shallow and deep emotional performances; men are more restrained in regulating their emotions and tend to use shallow acting (Yin et al., 2017; Yang et al., 2018). Diefendorff et al. (2006) and Chapman and Goldberg (2017) also found that emotional labor and personal traits were negative predictors of extraversion, conscientiousness, agreeableness, self-monitoring and superficial acting, while neuroticism positively predicts shallow acting. Employees will interact with the person being served with disguised and false emotions, while extraversion and agreeableness are positive predictors of real emotional performance. Lu and Sun (2021) also confirmed that high agreeableness and conscientiousness in nurses' personality traits are negatively correlated with surface acting, but positively correlated with deep acting. Therefore, it also shows that the higher the level of emotional intelligence of employees, the higher the deep behavior, and that the less the shallow behavior, the higher the subjective well-being.

Regarding the influence of emotional labor, many scholars believe that it is bidirectional. Erez and Isen (2002) confirmed that emotions may affect cognitive processes, and positive emotions have more persistence and more explicit motivation than neutral emotions. Therefore, it is believed that positive emotions have an impact on goal commitment. Emotional labor occurs when someone's personal state and work situation are inconsistent; employee emotional instability will have a significant negative impact on in-role performance (Raja and Johns, 2010; Probst et al., 2017). Therefore, the internal response based on environmental stimuli is particularly important, because it can directly affect the display of interpersonal behavior (emotional performance) (Schreuder et al., 2016). However, the effects of superficial acting and deep acting on displaying emotional regulation strategies that meet the situational requirements also differ between individuals (Miller and Gkonou, 2018). Previous studies have found that employees will interact with the people they serve with disguised and false emotions. A real emotional performance of extroversion and agreeableness is a positive predictor, and extraversion is more sensitive to positive emotions. Miller and Gkonou (2018) pointed out the benefit of showing true feelings to clients and showing emotions with true thoughts, noting that extraversion is less painful to positive display rules in the moderating effect of emotional strategies. In addition, studies have found that proactive personality traits are significantly positively correlated with extraversion personality traits (Bateman and Crant, 1993). Exhibitors will also persevere in completing their goals. Thus, it is possible for them to exceed the in-role performance required by their basic job requirements. Employees with strong proactive personalities tend to actively explore or improve the expression of emotional states required by situational constraints at work, so as to promote their expressed emotions to adapt to their service interactions. This trait will encourage employees to internalize the needs and corporate values of the service object and show real emotional experience and empathy, rather than "masking." Therefore, their emotional labor behavior may have positive utility (Grandey, 2003; Goldberg and Grandey, 2007; Wen et al., 2019). Other studies have found that employees with autonomy have a negative relationship with shallow acting (Goldberg and Grandey, 2007; Muthukrishnan et al., 2018). This can also positively predict deep acting and job satisfaction. Deep acting is further beneficial for avoiding burnout and promoting performance growth within individual roles (Phuoc et al., 2022). This may be because it enables employees to match their real emotions with organizational rules, by learning the internal psychological process of cognition and thinking about phenomena, so as to achieve a unified and coordinated subjective perceptive activity of regulating internal and external emotions. Therefore, this study proposes the following hypotheses:

> *H2a*: Superficial acting has a negative moderating effect on proactive personality and employees' in-role performance.
>
> *H2b*: Deep acting has a positive moderating effect on proactive personality and employees' in-role performance.

Differential leadership categorizes subordinates (defines insiders and outsiders)

Jiang and Cheng (2014) pointed out that "insiders" will obtain team resources, but also need to make certain contributions in exchange, while outsiders will have less resource allocation, less strictness, less empowerment, alienation and indifference in interaction, and will be treated in accordance with rules and procedures. Subordinates with closeness, loyalty, and talent may not only positively promote the performance of the supervisor, but also receive generous rewards (Cheng et al., 2002; Epitropaki et al., 2016). For subordinates who only have kinship and loyalty but lack talent, leaders will give more care than to outsiders, based on their personal feelings. Talented people, even if they do not have kinship and loyalty, however, will also be identified and brought into the insider group (Ding and Jie, 2021). The subordinates of the insiders who are cared for privately will show more returns to the leaders when they are favored. When other members observe this phenomenon, the status of being inside or outside the circle becomes a motivator for their actions. Some "outsiders" will take the initiative to approach employees in the circle for their own interests, while continuing to discover interaction rules among people in the circle, which will lead to a good relationship with them, and thus indirectly obtain needed information and resources (Luo et al., 2016).

The impact of differential leadership on employees' in-role performance

In Chinese culture, subordinates admire the power of their superiors, which is considered reasonable and an invisible norm (Xiong Chen and Aryee, 2007; Piansoongnern, 2016). Superiors' treatment of their employees due to the distance of personal relationships is generally accepted by subordinate employees as biased treatment. Also, in an exchange relationship, the subordinates get benefits, and they will repay their superiors through their personal work performance, so as to achieve a reasonable exchange. Valuable communication and positive feedback can strengthen the individual's sense of competence and autonomy and help to enhance their internal motivation (Matschke and Fehr, 2015).

When superiors treat employees favorably, employees will have a sense of belonging such as being valued, recognized, and understood. They will have a greater right to speak in the organization. They may also participate in leadership decision-making and give more resource allocation to information and material rewards (leadership investment). At the same time, due to the close relationship, they will take the initiative to view themselves as the leader's "insiders," and the return to the leader is loyalty, dedication, and better performance (Luo et al., 2016). If an "insider" makes mistakes at work, the mistakes made by the subordinate are less likely to be investigated, and they may even be intentionally overlooked. This custom is considered to be "protecting the calf"; it is tolerant and will help subordinates to find solutions to problems. The subordinates of the "guarded insiders" (those accepting the leader's reward) will also feel gratitude and recognize their superior's status. Their trust and respect for the leader will be deepened, and they become more active and involved at work. For outsiders, however, their relationship with the leader is more estranged. Being treated badly, "outsiders" have no first-hand information related to work tasks. Nor are opportunities made available in a timely manner. Since they cannot get resources and rewards in the same way as "insiders," psychological imbalances may develop, which will affect their work performance and even cause negative behaviors over time (Wang et al., 2021). Matschke and Fehr (2015) found that restrictions, directives, and threats reduce individuals' subjective motivation and weaken their internal motivation. When employees face a lack of promotion opportunities, their output in the organization will reduce, affecting their in-role performance, due to their inability to develop their own insider identity. Therefore, this paper proposes the following hypotheses:

> *H3a*: Differential leadership's preference (DLP) to insiders has a positive impact on employees' in-role performance.
>
> *H3b*: Differential leadership's bias (DLB) against outsiders has a negative impact on employees' in-role performance.

Differential leadership and the sense of organizational justice

Adams (1965) defined organizational justice as the perception of fairness in resource distribution and presented the fairest distribution as rewarding people according to their contributions. The more one contributes, the more one should get in return. Cropanzan et al. called employees' judgments, perceptions, and feelings of fairness in organizations the "fairness perceptions of justice." Our paper adopts this definition of organizational justice from Cropanzan et al.

Differential leadership usually treats subordinates differently based on characteristics such as their efficiency and similarities to the leaders. This differential management style both is motivated by the purpose of getting the job done and is influenced by purely personal preference. Most of the people inside their "relationship circle" are entrusted with important responsibilities, as well as being fostered and cultivated as cronies who enjoy resources and respect. On the other hand, people outside the circle are treated normally, act according to the rules, and experience a management method that is strict and rigid, or even unreasonable (Jiang and Cheng, 2014; Donia et al., 2016). Therefore, the rewards in the workplace are differentiated. Differential management may increase the phenomenon of members being marginalized within the organization. If people outside the circle find that they are not getting the attention of the leader, they will start to compare their own treatment and information channels to those obtained by the "insiders." Finding themselves unable to get close to the controller of resources, they can feel lost and can conclude that they are treated unfairly. Some studies have shown that differential leadership results in unfair distribution of material interests and a loss of closeness and trust among "outsiders" (Zheng, 1995; Shu and Lazatkhan, 2017). Akram et al. (2021) believe that, in the context of perceived psychological stress, abusive supervision has both direct and indirect negative impacts on employee creativity. However, distributive and procedural justice are found to be able to mitigate abusive supervision's negative effects on employee creativity. In an atmosphere of "leadership fairness," subordinates tend to trust an organization's distribution process and would tend to put the blame on their own actions if they received a low salary. Thus, they will work even harder (Engelbrecht and Samuel, 2019); this tendency is particularly true among employees who are "insiders" of the leadership. This leads to the following hypotheses:

> *H4a*: Differential leadership's preference (DLP) to insiders will positively affect employees' sense of organizational justice.
>
> *H4b*: Differential leadership's bias (DLB) against outsiders will negatively affect employees' sense of organizational justice.

The relationship between organizational justice and employees' in-role performance

A fair relationship is one of the most satisfying social relationships in interpersonal communication. A sense of justice is seen as a motivation that can effectively predict one's organizational behavior. Albalawi et al. (2019) and Akram et al. (2021) show that distributional justice, procedural justice, leadership justice, and information justice have significant positive correlations with task performance, interpersonal promotion and work dedication. The main reason is that "relationships" are the basis for multi-party social exchanges and judgments. Since the behavioral style of superiors directly affects the action orientation of their employees, superior support has more influence on in-role performance. Yean (2016), Pournader et al. (2020), and Al-Omar et al. (2019) believed that a lack of organizational justice will directly endanger employees' benefit distribution, interpersonal relationships, and work efficiency. Its organizational fairness is related to a psychological contract. As a kind of implicit but active and flexible virtual contract, it can maintain relationships and output efficiency even within highly emotionally challenging organizations. When there is a sense of a lack of fairness, however, people will feel disappointed and will stop believing that efforts and rewards are proportional, resulting in them no longer producing as many thoughts or behaviors that would have been valuable to the organization. Feelings of being treated unfairly and dissatisfaction with the assigned results may also be compensated for in other negative ways (such as theft or sabotage). Therefore, the following hypothesis is made:

> *H5*: Organizational justice positively affects in-role performance.

The relationship between organizational justice, differential leadership and in-role performance

According to social exchange theory and fairness theory, individuals will return the value they have acquired in order to maintain the distribution of benefits of a social interaction. Zhu and Xie (2018) and Nauman et al. (2020) pointed out that, if employees and the organization have sufficient and fair social exchanges, then employees will feel that they receive sufficient attention and support from the organization. Their sense of identity and responsibility will be significantly enhanced and will spontaneously produce positive behaviors that are beneficial to the organization. This kind of fairness will make employees feel that they have the responsibility and obligation to do their work better and to contribute to the development of the organization. In contrast, if the sense of justice within the organization is weak, then employees may feel that they are incapable of changing the atmosphere, resulting in two psychological behaviors. The first of these behaviors is positive: a growing effort to achieve a stronger right to speak and to try to improve unfair environments in the organization, opening a positive path for later employees. The second behavior is negative, and can be divided into two aspects: (1) an attitude which believes that, in an unfair environment, no matter how hard you try, you will not be able to achieve your ambitions and prospects, but that you cannot give up due to social life factors; and (2) anti-productive behavior (Pournader et al., 2020) that can induce a destructive behavior in the organizational environment. This can spread or instigate other employees to also act poorly.

To sum up, from the perspective of social exchange, the determination of fairness depends on whether each person receives equal benefits and distribution during exchange processes. The distribution of benefits is based on contributions, but both parties are restricted by social rules. It also depends on the ownership of the resource and the relationship with the dominant player during the exchange. When employees feel that the interpersonal relationship is unbalanced, their sense of justice will be lacking and their work engagement will decrease, resulting in lower in-role performance. Therefore, this paper proposes the following hypotheses:

> *H6a*: Organizational justice has a mediating effect on the relationship between differential leadership's preference (DLP) for insiders and employees' in-role performance.
>
> *H6b*: Organizational justice has a mediating effect on the relationship between differential leadership's bias (DLB) against outsiders and employees' in-role performance.

The moderating effect of employees' proactive personality

Employees with proactive personalities have inherent positive tendencies and the characteristic of creating a favorable environment, so their ability to adjust to the environment is also high. The differential treatment of "insiders" and "outsiders" by differential leadership has also become a means of differential incentive management. Because of the existence of favorable treatment toward "insiders," when faced with differential treatment by differential leaders, employees with high proactive personality are more likely to take the initiative (Li et al., 2018; Wang and Lei, 2021). Therefore, if people outside the circle also have a strong proactive personality, they will use growth needs as the motivation to change or win the favor of the leader and change the leader's classification of themselves. In this context, the sense of organizational justice is considered to be a very important situational factor that affects the expression of individual characteristics. Employees with high proactive personality will find ways to meet and achieve their expected goals, and when they perform, they will also evaluate and segment the expected target to offset the initial high sense of unfairness and to gradually reduce or replace it. Also, because they are unwilling to be restrained, when the organization hinders their interpersonal relationships and career development, they will actively improve the environment. They hope to gain achievements and status in the organization, to be valued and promoted by leaders, and to achieve their goals or obtain target resources. At the same time, employees who are "insiders" with proactive personalities may, based on their own ability, take their favorable treatment from their leader for granted and view such favoritism as fairness, even when they have obtained more resources than others. Individuals with a lower proactive personality exhibit the opposite behavioral pattern. They fail to recognize opportunities, appear relatively passive, and like to rely on others to drive change. Therefore, this paper proposes the following hypotheses:

> *H7a*: Proactive personality positively moderates the relationship between differential leadership's preference (DLP) to insiders and organizational justice.
>
> *H7b*: Proactive personality positively moderates the relationship between differential leadership's bias (DLB) against outsiders and organizational justice.

Methodology

In this study, we used PROCESS SPSS MACRO for analysis. All dimensions were averaged by the method of ITEM PARCELING, and we turned this into an observation variable for analysis. Therefore, the graphics are rendered in squares that are for path analysis.

Sampling and data collection

The data used in this study were collected from supervisors and subordinates of well-known hospitals (one of the research assistants was previously a nurse) and of health institutions in Beijing in China. A total of 900 questionnaires for supervisors and subordinates were distributed (250 for supervisors and 900 for subordinates). After deducting invalid questionnaires, a total of 524 valid samples (192 questionnaires for supervisors and 524 questionnaires for subordinates) were obtained; the recovery rate of valid samples was 58.2%. The subjects of this research questionnaire were the paired questionnaires of direct supervisors and subordinates. A set of valid questionnaires was obtained when a supervisor matched 3–5 subordinates (if the supervisor did not answer or if the number of subordinates who answered was insufficient, then the group of data was deleted). In addition to collecting data from different sources, this study also collected data at different time points (that is, at a 1-month interval), so as to avoid the problem of common method variation. The procedure for distributing the questionnaires for this study was as follows:

1. This study first contacted the liaisons of hospitals and health institutions in Beijing, and screened the eligible subjects for the questionnaire. The subject must be one supervisor with at least 3 subordinates. After asking for the number of supervisors and subordinates who were interested in participating in this study, the questionnaires were sent to the liaisons of each institution, for assistance in forwarding the questionnaires to the study participants.
2. Each questionnaire included the purpose of the research and the method for answering the questionnaire. In the first stage, after all subjects had filled in their basic information, the

supervisors conducted a self-assessment on differential leadership, while the subordinates answered an assessment on their sense of organizational justice. After filling out all the questions, each participant put the questionnaire in an envelope and returned it to the contact person. In the second stage, 1 month after completion of the questionnaire, the subordinates would evaluate their in-role performance, proactive personality, and emotional service, then return the questionnaire to the contact person in an envelope.

Data analysis

Stratified random sampling was used for this study. The samples came from six main urban areas in Beijing (Dongcheng, Xicheng, Chaoyang, Fengtai, Shijingshan, and Haidian Districts), and the hospitals in the 6 urban areas were classified according to their grade levels (Grade 1 and below, Grade 2, and Grade 3 and above). According to the Information Center of the Beijing Municipal Health Commission, there were about 297,000 registered health technicians in Beijing in 2020. Among them, there were 189,000 people in the six major urban areas, with the grade levels of first-level-and-below, second-level, and third-level-and-above accounting for about 10, 35, and 55%, respectively. Ghiselli et al. (1981) proposed that the number of questionnaires to be distributed should be at least 5–10 times the number of itemized questionnaires. This study originally had a total of 58 topics, so 900 questionnaires were randomly distributed. The first phase began distribution in early January 2021, breaking up the questions and distributing 300 copies at random. In order to recover real and effective data smoothly, each participant was offered a "red packet" (a Chinese custom of showing appreciation) as a reward after completing and returning a questionnaire. By February 6, 250 questionnaires had been received. After eliminating unqualified questionnaires, such as those with confusing basic information or that had been filled-in incompletely or left blank, we finally recovered 213 valid questionnaires; so, the effective questionnaire rate was 71%. For the second stage, after a 1-month interval, the questions were broken up and 600 copies were distributed randomly on February 10. By March 30, 477 copies were recovered. After excluding invalid questionnaires with missing values, wrong answers or random answers, we recovered a total of 311 valid questionnaires; the effective rate of the questionnaire was 51.83%.

The total number of participants in this study was 524. There were 167 males and 357 females, and their majors varied. The 524 participants were distributed thusly by age: (below 20 years old: 59, 11.3%; 21–30: 313, 59.7%; 31–40: 112, 21.4%). Most respondents were undergraduates (252, 48.1%). In seniority, 401 had served 2 to 10 years (76.6%). Regarding position, "without any title" were 325 (62%); 134 were at a basic level (25.6%). In terms of hospital scale, most of the participants were from Grade 2 and above (473, 90.3%).

Instrument and measurement

Dependent variables

The measurement method of the research constructs was developed based on previous reports in the literature. All items were assessed based on a five-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (5). To assure the consistency of the measure used, translation and back-translation procedures between the Chinese and the English language (Van de Vijver and Leung, 1997) were applied. Furthermore, three business administration professors helped to revise the descriptions of the scale items to confirm the construct's validity. Finally, a pretest was done among 130 medical staff. A reliability analysis showed no item with an item-to-total value below 0.30. Employee in-role performance was measured with the use of five items adopted from Eisenberger et al. (2010): 1. Completing the assigned tasks successfully. 2. Fulfilling the job content specified by the job responsibilities. 3. Meeting the performance requirements set out in the job. 4. Accomplishing the tasks expected by the organization. 5. Sometimes neglecting some of the responsibilities that should be performed at work occasionally*. The fifth question is given an asterisk (*) because it is a reverse question, used to verify whether the answer-logic of the subjects is consistent, between before and after.

Independent variables

Proactive personality was measured with the use of 17 items adopted from Bateman and Crant (1993). The scale was adapted to the localization context, and after EFA reduction, 8 items were selected: 1. "No matter what the situation is, as long as I decide things, I will put them into practice." 2. "I am willing to stand up for my ideas even in the face of opposition." 3. "I am used to standing up for others when it comes to giving advice and implementing new projects*." 4. "No matter where I am, I have a strong ability to drive organizational change to happen." 5. "If I see something unreasonable, I will change it." 6. "There is nothing more exciting than seeing your ideas come true." 7. "I am always looking for new ways to improve my work." 8. "I am able to keenly identify and grasp opportunities for learning and advancement at work." Note, again, that the * indicates a reverse question.

Differential leadership was measured with the use both of 11 items that are biased towards outsiders which have been adopted from Jiang and Cheng (2014) and also of the 10 items that are biased toward insiders which have been adopted from Jiang and Zhang (2010). After context modification, the measurement basis of differential leadership was generated. *Preference to insiders*: 1. Greeting employees and having frequent contact and interaction. 2. Spending more time on personal experience sharing and guidance. 3. Helping and supporting in emergencies. 4. Assigning a subordinate to convey work information frequently. 5. Giving more opportunities to get rewards and promotions. 6. Assigning more important and easy-to-achieve tasks. 7. Giving large rewards. 8. Lessening penalties for work mistakes. 9. Rarely getting blamed for mistakes at work, and 10. Rarely pursuing subordinates for mistakes. *Bias against outsiders:* 11. Having an indifferent attitude and keeping a certain distance*. 12. Being less likely to mentor or share work experience and knowledge skills*. 13. Being less likely to help solve problems at work*. 14. More often withholding key information at work*. 15. In the performance appraisal of subordinates, being less merciful, and handling everything in accordance with the rules and regulations*. 16. When subordinates review their own mistakes, strictly accusing without mercy*. 17. Being less likely to be perceived as needing assistance when things go wrong*. 18. More often ignoring work problems reported by subordinates*. 19. Making frequent public criticism and censure*. 20. Often being sarcastic at work*; and 21. More often arranging complex and difficult tasks that are not easy to complete*. Note: * indicates a reverse question.

Emotional labor was measured with the use of 8 items adopted from Grandey (2003). Grandey (2003) divides emotional labor into two dimensions: surface behavior and deep behavior. This division fits the Chinese context. *Shallow play:* 1. “Even if I am in a bad mood, I will show a happy appearance.” 2. “At work, no matter how complicated my inner feelings are, I will play appropriate attitudes and emotions to meet the emotional expression requirements of the organization.” 3. “In order to express the emotions required for work, I wear a ‘mask.’” 4. “Emotions expressed at work do not match my inner feelings.” *Deep play:*5. “When facing colleagues and work, the emotions I express are from the heart.” 6. “When there is a problem at work, I will try my best to overcome the bad emotions and actively solve the problem.” 7. “For the sake of work, even if I am in a bad mood, I will try to adjust my mood.” 8. “When you are in a bad mood, by communicating with colleagues and actively engaging in work, the negative emotions will be reduced.”

Organizational justice was measured with the use of 10 items adopted from Niehoff and Moorman (1993) and Wang (2009). The 10 items are as follows: 1. “Leaders show me respect when making a decision about my job.” 2. “When making a decision related to my job, the leader chooses to do so in a practical way.” 3. “Leaders will treat me fairly and equitably when making a decision related to my job.” 4. “Organizational leaders make work decisions in an unbiased state.” 5. “Decisions made by the organization apply consistently to all employees.” 6. “The top leaders of the organization will collect sufficient and correct information before making decisions.” 7. “When subordinates request, the leader will clarify some relevant decision-making supplementary information.” 8. “I think the workload assigned to me is fair.” 9. “I think my salary is fair.” 10. “My work rights and responsibilities are relatively fair.”

Common method variation

In order to avoid the validity problems caused by questionnaires coming from the same source or the same test environment, this research uses a reverse questionnaire design and a post-event statistical control to reduce or even avoid the influence of CMV. This step uses the Harman (1976) one-factor test. It can be seen from Table 1 that the explained variance value of the first principal component before rotation is 32.674% < 40%, indicating that the common method bias test was passed.

Data collection

The survey instrument contained 48 items (totaling 7 constructs) adapted from previous studies (see Appendix B). The survey measured participants’ perceptions with a 5-point Likert scale, ranging from totally disagree to totally agree. Higher scores on this instrument indicated more positive perceptions. All data were collected by online survey.

Results

Data analysis

This study uses structural equation modeling (SEM) to test the measurement model’s reliability and validity. (Note that SEM is only used for validation; SPSS PROCESS MACRO is used to test mediation and moderation, in keeping with the research framework presented in Figure 1). Amos 24 was used to evaluate the measurement model. In this model, if the chosen indicators for a construct do not measure that construct, then the testing of that structural model will be meaningless (Jöreskong and Sörbom, 1998). Thus, the first-step in the modeling approach, as recommended by Anderson and Gerbing (1988) and McDonald and Ho (2002), was followed by carrying out a confirmatory factor analysis (CFA) to provide an assessment of convergent and discriminant validity, and then the PROCESS was carried out to provide the path coefficients, mediations, and moderations.

Measurement model

The measurement model was assessed using AMOS 24.0 with maximum likelihood estimation (MLE) in terms of individual item factor loadings, reliability of measures, convergent validity, and discriminant validity. MLE allows computation of assorted indices of goodness-of-fit and the testing of the significance of loadings and correlations between factors, but it requires an assumption of multivariate normality. Table 2 presents a summary of the unstandardized factor loadings, standard error, significance test, standardized factor loadings, composite reliability (CR), and average variance extracted estimates (AVE). CR reflects the internal consistency reliability among indicators of a construct. As shown in Table 2, all values of the CR exceed 0.7, thus showing good reliability for all six constructs. Fornell and Larcker (1981) proposed three measures for assessing convergent validity of the measurement items: (a) item reliability of each measure, (b) composite reliability of each construct, and (c) the average

TABLE 1 Common method bias tests.

Element	Initial eigenvalues	% of variance	Cumulative %	Extract the square	% of variance
1	16.99	32.674	32.674	16.99	32.674
2	3.827	7.361	40.034	3.827	7.361
3	3.516	6.762	46.796	3.516	6.762
4	2.645	5.087	51.884	2.645	5.087
5	2.389	4.593	56.477	2.389	4.593
6	1.745	3.355	59.832	1.745	3.355
7	1.399	2.690	62.522	1.399	2.690

Compiled by this study.

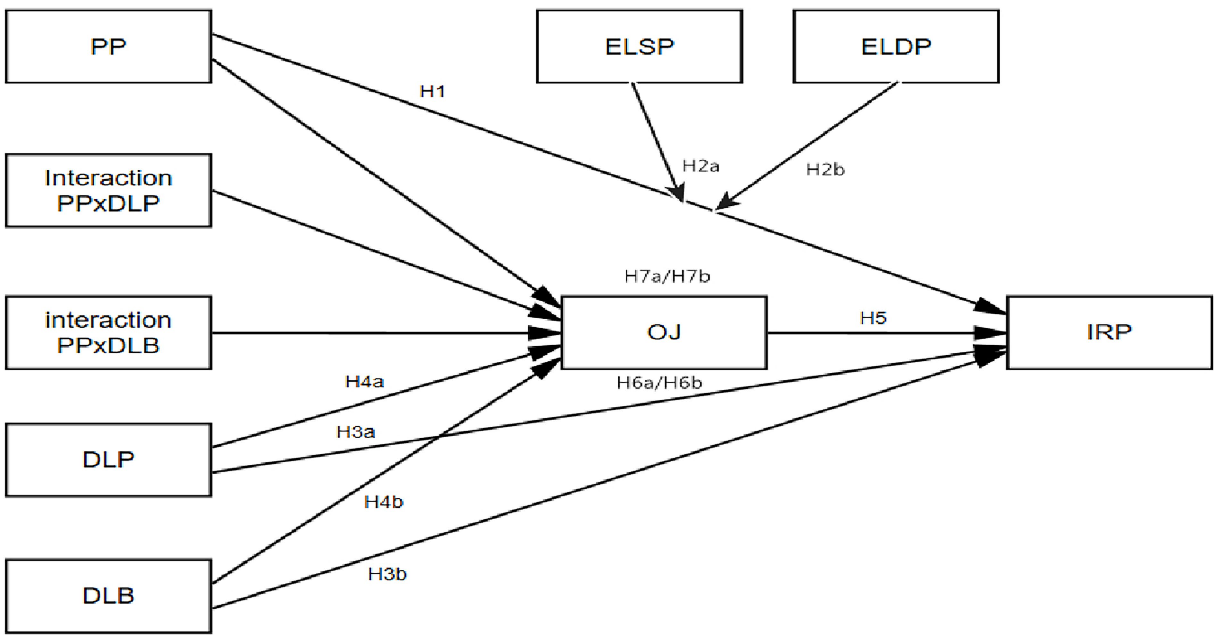

FIGURE 1
Research framework. Compiled by this study.

variance extracted (AVE). On the reliability of the items, the standardized loading values exceeded 0.6 that are ranging from 0.672 to 0.840, the recommended threshold by Gefen et al. (2000), thus demonstrating convergent validity at the item level. For composite reliability, all values exceeded 0.7 that are ranging from 0.804 to 0.924, the recommended threshold by Nunnally and Bernstein (1994). Lastly, on the average variance extracted, all values exceeded 0.5, ranging from 0.539 to 0.639. Given the satisfaction of three criteria, the convergent validity for the proposed constructs of the measurement appears to be adequate.

For the discriminant validity, the square root of the AVE for a given construct was compared with the correlations between the construct and other constructs (Fornell and Larcker, 1981). If the square root of the AVE of a construct is greater than the off-diagonal elements in the corresponding rows and columns, then this indicates that that construct is more-closely related with its indicators than with the other constructs. In Table 3, the diagonal elements in the matrix are the square roots of the AVE. Because the square roots of the AVE are higher than the values of its corresponding rows and columns, discriminant validity is found to be satisfactory for all constructs.

Direct effect analysis

Before we tested mediation and moderation, the path coefficients of independent variables to dependent variable were computed. The full model is comprised of two sub-models. Model 1 entails the regressing of the OJ onto PP, PP × DLP, PP × DLB, DLP and DLB. Model 2 involves the regressing of Y onto PP, OJ, DLP, and DLB. The obtained results are presented in Table 4.

The coefficient for all independent variables were significant to OJ, including the interaction between PP and DLB, PP and DLP were significant. In the second part regression, IRP was regressed on PP, OJ, DLP and DLB. The coefficients were significant here also, but with DLP➔IRP.

TABLE 2 Reliability and convergent validity.

Construct	Item	Significance test of parameter estimation				Item reliability		Composite reliability	Convergence validity
		Unstd.	S.E.	Unstd./S.E.	*p*	STD.	SMC	CR	AVE
DLB	DLB1	1.000				0.691	0.477	0.928	0.539
	DLB2	0.967	0.066	14.727	0.000	0.676	0.457		
	DLB3	1.271	0.079	16.069	0.000	0.754	0.569		
	DLB4	1.271	0.080	15.973	0.000	0.749	0.561		
	DLB5	1.085	0.071	15.265	0.000	0.710	0.504		
	DLB6	1.114	0.074	14.998	0.000	0.699	0.489		
	DLB7	1.173	0.074	15.941	0.000	0.747	0.558		
	DLB8	1.210	0.077	15.627	0.000	0.727	0.529		
	DLB9	1.289	0.079	16.275	0.000	0.764	0.584		
	DLB10	1.231	0.072	17.008	0.000	0.791	0.626		
	DLB11	1.217	0.075	16.206	0.000	0.758	0.575		
DLP	DLP1	1.000				0.780	0.608	0.924	0.550
	DLP2	0.948	0.052	18.395	0.000	0.748	0.560		
	DLP3	0.945	0.052	18.145	0.000	0.743	0.552		
	DLP4	0.917	0.052	17.567	0.000	0.729	0.531		
	DLP5	0.872	0.052	16.930	0.000	0.708	0.501		
	DLP6	0.949	0.053	17.947	0.000	0.738	0.545		
	DLP7	0.962	0.052	18.512	0.000	0.760	0.578		
	DLP8	0.814	0.050	16.359	0.000	0.683	0.466		
	DLP9	0.871	0.050	17.377	0.000	0.720	0.518		
	DLP10	0.981	0.049	20.083	0.000	0.800	0.640		
ELDP	ELDP1	1.000				0.839	0.704	0.876	0.639
	ELDP2	0.842	0.043	19.657	0.000	0.764	0.584		
	ELDP3	0.810	0.041	19.574	0.000	0.772	0.596		
	ELDP4	0.947	0.045	21.060	0.000	0.820	0.672		
ELSP	ELSP1	1.000				0.780	0.608	0.804	0.507
	ELSP2	0.832	0.060	13.909	0.000	0.672	0.452		
	ELSP3	0.811	0.057	14.158	0.000	0.678	0.460		
	ELSP4	0.874	0.059	14.888	0.000	0.714	0.510		
IRP	IRP1	1.000				0.764	0.584	0.873	0.580
	IRP2	0.869	0.053	16.556	0.000	0.730	0.533		
	IRP3	0.867	0.052	16.660	0.000	0.723	0.523		
	IRP4	0.963	0.055	17.648	0.000	0.764	0.584		
	IRP5	0.988	0.052	19.033	0.000	0.823	0.677		
OJ	OJ1	1.000				0.817	0.667	0.922	0.543
	OJ2	0.808	0.046	17.577	0.000	0.700	0.490		
	OJ3	0.767	0.044	17.339	0.000	0.692	0.479		
	OJ4	0.921	0.046	19.905	0.000	0.767	0.588		
	OJ5	0.854	0.046	18.453	0.000	0.726	0.527		
	OJ6	0.812	0.044	18.465	0.000	0.723	0.523		
	OJ7	0.804	0.044	18.070	0.000	0.714	0.510		
	OJ8	0.814	0.044	18.330	0.000	0.722	0.521		
	OJ9	0.844	0.046	18.241	0.000	0.720	0.518		
	OJ10	0.900	0.044	20.427	0.000	0.781	0.610		
PP	PP1	1.000				0.837	0.701	0.922	0.596
	PP2	0.943	0.046	20.456	0.000	0.768	0.590		
	PP3	0.847	0.045	18.878	0.000	0.727	0.529		
	PP4	0.829	0.044	18.650	0.000	0.718	0.516		
	PP5	0.866	0.043	19.984	0.000	0.761	0.579		
	PP6	0.906	0.046	19.686	0.000	0.747	0.558		
	PP7	0.983	0.048	20.645	0.000	0.771	0.594		
	PP8	0.984	0.041	23.786	0.000	0.840	0.706		

Unstd, Unstandardized factor loadings; Std, Standardized factor loadings; SMC, Square Multiple Correlations (square of STD); CR, Composite Reliability; AVE, Average Variance Extracted.

TABLE 3 Discriminant validity of Fornell and Larcker criteria.

Construct	Pearson product correlation coefficients						
	PP	DLP	DLB	OJ	ELSP	ELDP	IRP
PP	**0.772**						
DLP	0.485	**0.734**					
DLB	−0.510	−0.502	**0.742**				
OJ	0.438	0.540	−0.626	**0.737**			
ELSP	0.283	0.230	−0.366	0.267	**0.712**		
ELDP	0.490	0.345	−0.444	0.308	0.494	**0.799**	
IRP	0.518	0.442	−0.624	0.527	0.412	0.588	**0.762**

The diagonal elements are the square root of AVE, the off-diagonals are Pearson coefficients Structural model.
Compiled by this study.

TABLE 4 Regression coefficients.

DV	IV	Coeff	SE	*t*	*p*	LLCI	ULCI	R^2
OJ	Constant	2.960	0.236	12.517	0.000	2.495	3.424	0.455
	PP	0.102	0.033	3.050	0.002	0.036	0.168	
	PP ×DLP	**0.199**	**0.036**	**5.572**	**0.000**	**0.129**	**0.270**	
	PP × DLB	**0.187**	**0.031**	**5.980**	**0.000**	**0.125**	**0.248**	
	DLP	0.328	0.041	8.067	0.000	0.248	0.408	
	DLB	−0.311	0.038	−8.084	0.000	−0.386	−0.235	
IRP	Constant	2.948	0.313	9.427	0.000	2.334	3.563	0.393
	PP	0.195	0.039	5.072	0.000	0.120	0.271	
	OJ	0.180	0.050	3.593	0.000	0.082	0.279	
	DLP	0.085	0.049	1.753	0.080	−0.010	0.181	
	DLB	−0.361	0.048	−7.604	0.000	−0.455	−0.268	

Compiled by this study.

Two interactions to OJ are significant: PP × DLP ➔OJ ($\beta = 0.199$, SE = 0.036, t = 5.572, $p < 0.001$, [0.129 0.270]) and PP × DLB ➔OJ ($\beta = 0.187$, SE = 0.031, $t = 5.980$, $p < 0.001$, [0.125 0.248]).

Mediation and moderation analysis

In the mediating and moderating analysis, we examined the mediation effect first. Mediation analysis is used to identify and explicate the relationship between the dependent variable Y and an independent variable X, which may be affected *via* the interaction of a third variable M. Here, M is a mediating variable, and it represents a mechanism through which X affects Y. In our current study, "PP,""DLP,""DLB" are independent variables and "PP × DLP" and "PP × DLB" are our interactions impacts from "OJ"; with "OJ" acting as a mediator variable, which further affects the "IRP."

We conducted path analysis by PROCESS 3.5 macro (Hayes, 2012) to test these indirect effects, and we determined statistical significance by bootstrapping using 5,000 resamples (Hayes, 2009). In PROCESS v3.5 built-in models, we could find no model that fit to our hypothesis research model. Thus, we used PROCESS syntax to do the work; that syntax is presented in Appendix A.

Indirect effect analysis

We used 5,000 times bootstrap samples in the present study and determined the mediating effect of the 95% confidence interval. The results are shown in Table 5. The first column is the direct and indirect effects, the second through fourth columns are, respectively, the point estimate, standardize error, and confidence intervals. If confidence intervals do not include 0, then this means that an indirect effect is supported. The last 3 columns report the Sobel z tests; if $z > 1.96$ and $p < 0.05$, then an indirect effect is supported. Our five hypotheses were all supported by the results, as Table 5 shows. From Table 5, it can be seen that the indirect effect of the mediation path "Preference for Insiders-Organizational Fairness-In-Role Performance" is 0.059, at a 95% confidence interval. The upper interval is 0.104 and the lower interval is 0.022; thus it does not include any 0 values. Moreover, the *p* value is less than 0.05, all of which indicates that there is a significant mediating effect. In addition, the direct effect is 0.085. The 95% confidence interval of Bias-correction contains 0, so the direct effect is not significant. Therefore, H6a is verified and is fully intermediary. The indirect effect of the mediation path "preference to outsiders-organizational justice-in-role performance" is −0.056, at a 95% confidence interval; the upper interval is −0.023, and the lower interval is −0.096. It does not include any 0 values and the *p* value is less than 0.05, thus indicating that there is a significant mediation effect. In addition, the direct effect is −0.361; the 95% confidence interval of Bias-correction does not contain a 0, so the direct effect is significant, and the estimated value becomes smaller. Therefore, it is verified that H6b is a partial intermediary.

Moderating effect

In order to better display the moderation effect, we followed Aiken et al. (1991) procedures and examined at one standard deviation (SD) above the mean, at the mean, and at one SD below the mean, for the personality values used as the moderator variable of interest. This analysis was to determine if the slopes of the regression equations for high and low values of the interaction differed from zero. The present study had explores two potentially moderation effects, PP × ELSP➔IRP and PP × ELDP➔IRP, and the analysis results are presented in Table 6 below (Other potential moderating effects could also be analyzed in future works). PP × ELSP➔IRP ($\beta = -0.154$, SE = 0.035, $t = -4.394$, $p < 0.001$, [−0.223–0.085]) and PP × ELDP➔IRP ($\beta = 0.112$, SE = 0.034, $t = 3.327$, $p = 0.001$, [0.046 0.178]), $p < 0.05$ and the bias-correction results do not include 0, which indicates that the moderating effect exists.

Analysis of research results

From the results of the path analysis in Table 4, we see that proactive personality has a significant positive impact on employee

TABLE 5 Mediating effects.

Path	Bootstrap 5,000 times confidence interval				Sobel *z* test		
	Estimate	BootSE	BootLLCI	BootULCI	SE	*Z*	*p*
Direct effect							
PP → IRP	0.195	0.039	0.12	0.271			
DLP → IRP	0.085	0.049	−0.01	0.181			
DLB → IRP	−0.361	0.048	−0.455	−0.268			
Indirect effect							
PP→OJ→IRP	**0.018**	**0.010**	**0.002**	**0.040**	**0.008**	**2.275**	**0.023**
PP×DLP→OJ→IRP	**0.036**	**0.012**	**0.014**	**0.063**	**0.012**	**2.986**	**0.003**
PP×DLB→OJ→IRP	**0.034**	**0.012**	**0.012**	**0.061**	**0.011**	**3.048**	**0.002**
DLP→OJ→IRP	**0.059**	**0.021**	**0.022**	**0.104**	**0.018**	**3.261**	**0.001**
DLB→OJ→IRP	**−0.056**	**0.019**	**−0.096**	**−0.023**	**0.017**	**−3.262**	**0.001**

Compiled by this study.

TABLE 6 Moderating effect.

DV	IV	Coeff	SE	*T*	*p*	LLCI	ULCI	R^2
OJ	Constant	2.960	0.237	12.517	0.000	2.495	3.424	0.455
	PP	0.102	0.034	3.050	0.002	0.036	0.168	
	PP × DLP	0.199	0.036	5.572	0.000	0.129	0.270	
	PP × DLB	0.187	0.031	5.980	0.000	0.125	0.248	
	DLP	0.328	0.041	8.067	0.000	0.248	0.408	
	DLB	−0.311	0.039	−8.084	0.000	−0.387	−0.235	
IRP	constant	1.303	0.478	2.727	0.007	0.364	2.242	0.488
	PP	0.221	0.120	1.835	0.067	−0.016	0.457	
	OJ	0.177	0.047	3.785	0.000	0.085	0.268	
	ELSP	0.647	0.135	4.798	0.000	0.382	0.912	
	PP×ELSP	**−0.154**	**0.035**	**−4.394**	**0.000**	**−0.223**	**−0.085**	
	ELDP	−0.136	0.123	−1.112	0.267	−0.377	0.104	
	PP×ELDP	**0.112**	**0.034**	**3.327**	**0.001**	**0.046**	**0.178**	
	DLP	0.072	0.045	1.588	0.113	−0.017	0.161	
	DLB	−0.238	0.046	−5.182	0.000	−0.328	−0.148	

Compiled by this study.

performance within roles. Its standardized path parameter β value is 0.195, SE = 0.039, t = 5.072, $p < 0.001$, which means that H1 is verified. We also see from the path analysis results in Table 6 that PP × ELSP➔IRP (β = −0.154, SE = 0.035, t = −4.394, $p < 0.001$, [−0.223–0.085]. This shows that the interaction item "proactive personality" ×" superficial acting" has a significant negative effect on in-role performance. Therefore, the moderator variable "shallow acting" has a significant negative moderating effect on the relationship between "proactive personality" and "in-role performance." Hypothesis H2a is thus supported. PP × ELDP➔IRP ($\beta = 0.112$, SE = 0.034, $t = 3.327$, $p = 0.001$, [0.046 0.178], $p < 0.05$ and the 95% confidence result does not include 0, so the moderated effect exists. It shows that the interaction item "proactive personality" × "deep-play" has a significant effect on in-role performance. Hence, Hypothesis H2b is also supported.

Also from the results of the path analysis in Table 4, we see that the standardized path coefficients of differential leadership's preference to insiders and employees' in-role performance are $\beta = 0.085$, SE = 0.049, $t = 1.753$, $p < 0.08$, 0.099, p value is $0.04 < 0.05$, [−0.010 0.181], which means that Hypothesis H3a is invalid. Perhaps when the subordinates feel that the leader has a preference for them or that they have a special relationship with their leader, then they may become arrogant, thinking that they can survive in the business without working hard. In that case, then, their performance would be worse than others, over time. Real life anecdotal experience suggests that such people do exist.

There is a significant negative relationship between differential leadership's biases against outsiders and employees' in-role performance. From Table 4, we see that its standardized path coefficient $\beta = -0.361$, SE = 0.048, $t = -7.604$, $p < 0.001$, [−0.455–0.268], which means that Hypothesis H3b is supported. When employees are treated badly, they will feel insecure, uncertain, anxious, and other negative emotions, which will then affect their role behaviors and even produce negative behaviors (Zheng, 1995;

Jiang and Cheng, 2014). From Table 4, we see that the biased treatment of differential leaders will significantly and positively affect employees' sense of organizational justice. Its normalized path coefficient $\beta = 0.328$, SE = 0.041, $t = 8.067$, $p < 0.001$, [0.248 0.408], which means that Hypothesis H4a is valid. When employees are viewed as outsiders, differential leadership treats outsiders in a negative way, which will negatively affect employees' sense of organizational justice. Its normalized path coefficient $\beta = -0.311$, SE = 0.038, $t = -8.084$, $p < 0.001$, [−0.386–0.235], which means that Hypothesis H4b is also valid. When outsiders find a large gap (in terms of rewards and status they have received) between themselves and the insiders, they will feel unfairly treated. This feeling directly affects the actions and attitudes of outsiders. We can also see from Table 4 that $\beta = 0.180$, SE = 0.050, $t = 3.593$, $p < 0.001$, [0.082 0.79], indicating that the sense of organizational justice has a significant positive impact on the employees' in-role performance, so hypothesis H5 is also established.

From Table 6, the interaction terms between independent variables and moderator variables, the standardized path coefficients of proactive personality × differential leader's preference for oneself and organizational justice sense are $\beta = 0.199$, SE = 0.036, $t = 5.572$, $p < 0.001$, [0.129 0.270], which shows that Hypothesis H7a is valid. We can also see from Table 6 that the interaction term of the independent variable and the moderator variable, the standardized path coefficient of proactive personality × differential leadership to outsiders' bias towards organizational justice are $\beta = 0.187$, SE = 0.031, $t = 5.980$, $p < 0.001$, [0.125 0.248], verifying that hypothesis H7b is also valid.

In terms of the adjustment effect, Figure 2 shows that, when the level of "proactive personality" is low, low-level "superficial acting" has better in-role performance than "deep-level acting." For superficial acting in a high degree of "proactive personality," the in-role performance is better than a low degree of "proactive personality." Figure 3 shows that low-level superficial acting has higher in-role performance than higher superficial acting at a lower level of "proactive personality." Nonetheless, for higher

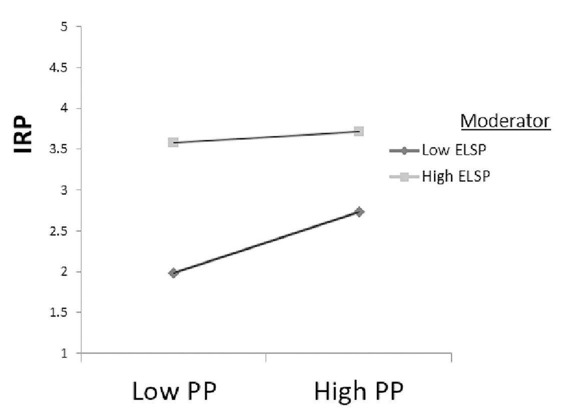

FIGURE 2
Proactive Personality × Superficial Play Interaction Effects. Compiled by this study.

"proactive personality," the performance of the two roles tends to be consistent.

Discussion and conclusion

The findings reveal that, when faced with difficulties or unfair treatment, employees with proactive personality traits may take the initiative to change situational obstacles, to improve current difficulties and to positively impact their in-role performance. This is consistent with the research proposed by Ghosh et al. (2017), who argue that subordinates may hold key information, and under the influence of certain factors, some negative behaviors mat manifest at work. There are always differences among people with different personalities, so even if the manager treats all of them poorly, not everyone's work performance will suffer equally, depending on personality. Maan et al. (2020) pointed out that, under the basis of social exchange and fairness theory, employees with proactive personalities may have higher job satisfaction, better innovative work behavior, and stronger learning goal orientations. A multifaceted view of social exchange emphasizes the significance of many sources of support. According to these approaches, employees of proactive personalities develop different give-and-reward relationships under different organizational goals (Lavelle et al., 2007; Buil et al., 2019), so that they may generate stronger job satisfaction, deeper organizational commitment, and better in-role performance (Joo and Bennett III, 2018). Managers can help employees adapt to the work environment and have better job satisfaction by identifying and managing their motivations and opportunities. However, employees with proactive personality traits can also negatively affect their in-role performance, if they use emotional adjustment strategies at a superficial level. Nonetheless, the effect of deep acting on in-role performance is not obvious, which is different from what has been found by some previous researchers. The reason may be that the samples in this study are doctors and nurses in health institutions and hospitals. These individuals are professionals and are respected by people and have high salaries, all of which may cause the average person to behave well towards them.

In addition, in Chinese culture, there is a leader-centered power relationship network, so the leader's partiality to insiders will make the employees feel that they are being treated fairly and being given corresponding powers with clear obligations in the invisible norms of the organizers in the circle. This could have a positive effect on their performance (Schaubroeck et al., 2017). Scholars refer to differential leadership as the leadership style in which a leader gives more partial treatment to their own subordinates. Although this leadership behavior may seem unfair, it is common in Chinese business organizations where the emphasis on human relations is rather common (Mingzheng and Xinhui, 2014; Li et al., 2017. In this study, however, the effect is not significant. Insiders may have a good relationship with the leader as mentioned above, but thus become arrogant. They may think their job condition is stable and not feel any need to work hard,

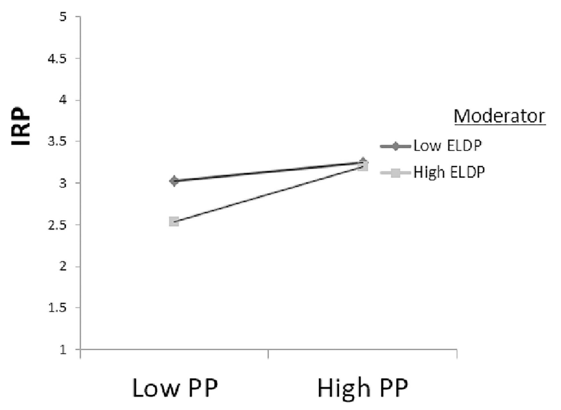

FIGURE 3
Proactive Personality × Deep Play Interaction Effect. Compiled by this study.

thus resulting in poor in-role performance. For outsiders, if they are not treated in the same way as insiders, they may have the feeling of being treated unfavorably. This feeling has a high negative correlation with performance, job satisfaction, and loyalty (Jiang and Zhang, 2010). This finding is consistent with the hypothesis of this study. In facing this kind of prejudicial treatment, the feeling of injustice increases over time, which not only consumes the employees' positive psychology, but also reduces the degree of their investment in the organization. Therefore, employees will be satisfied and motivated only when they perceive fairness. When they do, they are likely to continue to work actively. When unfairness is perceived, however, then, in order to compensate for that sense of injustice, employees may reduce work engagement and organizational commitment, and may also retaliate against the organization (Zhu and Xie, 2018). When insiders with proactive personality traits are treated favorably under differential leadership, the stronger their sense of organizational justice, the more engaged they are at work, and their in-role performance is significantly enhanced. On the other hand, outsiders with proactive personality traits, in the face of unfair interpersonal interactions, will look for ways to address their predicament and achieve their expected goals.

Theoretical implications of the research

From a theoretical point of view, this study has the following contributions. First, it can be used as the basis for deepening differential leadership. This study finds that leaders' differential treatment of different subordinates has group-level implications, and the results derived from differential treatment can reflect leaders' differential treatment behavior. It is a response to Jiang and Zhang's call (2010) to examine the relevance of differential leadership at different levels. Furthermore, this study agrees with both Jiang and Zhang (2010)'s and Leung and Barnes (2020)'s claims that leaders expect differential treatment to empower insiders so as to increase loyalty and effectiveness, and that subordinates outside the circle can also take the initiative to learn from their fellow workers and show behaviors that meet the expectations of their leaders.

Second, this research contributes to the research literature on the fairness of resource allocation, in regards to how fairness affects not only the individual rights of employees, but also the overall organizational performance. Differential leadership will therefore affect differential performance (Li et al., 2018). The results show that, with proactive personality traits, both "insiders" (who are treated favorably) and "outsiders" (who are treated unfavorably) may have a positive impact on organizational justice and on in-role performance – and if they succeed in this, it may lessen their negative perceptions of the organization. Our study is the first to simultaneously consider differential leadership bias (DLB) against "outsiders," proactive personality, and organizational justice in a single study. The results suggest that the effects of flawed differential leadership can also be motivating, as long as managers pay more attention to understanding employee traits when applying a differential leadership strategy.

Practical implications of the research

Whether the trusted subordinates can establish a harmonious and mutually beneficial relationship with other subordinates in the group is worthy of attention. If leaders can treat their subordinates fairly, regardless of whether they are inside or outside of their circles, and if they can promote mutual cooperation and assistance among all subordinates, then it may foster friendly relationships, both with subordinates and also between insiders and outsiders. Furthermore, through the two-way communication of insiders, the gap between a leader and the subordinates outside the circle (outsiders) can be reduced, and the subordinates outside the circle can also better understand the ideas and expectations of their leader, which may improve their chances of "upgrading" to insiders. In contrast, if a leader gives privileges to and tolerates mistakes from cronies based on personal relationships rather than their work performance, then these cronies may become arrogant and start bullying outsiders. Adding to anger and disapproval of cronies, outsiders will also have a negative impression on their leaders. Therefore, as Akram et al. (2021) has proposed, managers should provide opportunities for employees to participate and create a fair atmosphere in their organization, so as to mitigate the harmful consequences of abusive supervision.

In addition, this study confirms that outsiders with proactive personality traits also have an overall impact on both their own performance and also the performance of others on the inside, in the process of transformation. For employees outside the circle, getting help and support from insiders can reduce obstacles in the transition process, so as to optimize the allocation of high-quality resources by the controller. For insiders, new outsiders can be used as partners (Wang, 2015). Not only is it beneficial to their own work performance, but it also helps outsiders reduce the difficulties encountered in entering their circle within the organization. Both sides can benefit, and reduce the sense of threat to their status from the other (Fan and Zheng, 2000). Also, the sense of responsibility in the personality traits of medical staff is negatively correlated with surface acting, but is positively correlated with deep acting (Lu and Sun, 2021). This is likely because managers fully consider the emotional expression requirements of different post characteristics and thus choose medical staff with matching personality characteristics.

Limitations and directions for future research

While this research provides theoretical and managerial implications, there are some limitations to be acknowledged. First, due to time constraints and the pandemic, we were not able to conduct an actual interview with the survey respondents. All the questionnaires were distributed and collected through the contacts at the hospital and health institutions. Second, this study only investigated hospital staff, so the results may be consequently biased. It is not known what situation the respondents were in when they filled out the questionnaire, and there were difficulties in determining whether they were affected by constraints of the external environment. Third, this study selected medical staff from hospitals in the six major urban areas of Beijing, from Grade 1 to Grade 3-and-above. Thus, whether these survey results can also be inferred to employees in different regions and in different industries needs further verification. Fourth, there is a limitation of research dimensions. All variables in this study contain multiple dimensional structures and we did not explore the other variable dimensions or explore the mutual influence relationships among them, in a one-by-one manner.

There are several avenues for future studies. First, the research object can be expanded in scope or targeted to the service sector or to other related sectors. It is possible to further explore the impact of employees' own feelings and interactions on personal effectiveness. Alternatively, new research on the relationship caused by the differential atmosphere from different perspectives can be analyzed by paired samples. Second, in a differential leadership style, it is possible to further explore topics such as authoritarian and paternalistic leaders' differential treatment of employees based on tasks and emotions, which affects employee classification and self-perceived classification, as well as their active insider-and-outsider transfer process. Third, we can further explore the positive role of proactive personality and differential leadership styles in differential management areas, its impact on the effectiveness of the overall team, and the relationship conflicts between teams. Fourth, in a relational atmosphere supported by emotional commitment, the mediating relationship between emotional labor and differential management behavior in the team should be explored, and the relationship between its internal influence and the matching environment in the individual-organization should also be discussed. Fifth, in order to explore the overall impact, future scholars can discuss these variables in detail, so as to enhance the understanding of the influence of these factors. Follow-up researchers can consider the research issues and environmental constraints, and select objects and methods that are suitable for their own research and development conclusions.

Data availability statement

The original contributions presented in the study are included in the article/Supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent from the participants was not required to participate in this study in accordance with the national legislation and the institutional requirements.

Author contributions

S-TC was mainly responsible for writing the manuscript and analyzing the data. KH was in charge of revising and improving the manuscript.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2022.978495/full#supplementary-material

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The role of organizational citizenship behavior and patriotism in sustaining public health employees' performance

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Employee performance during health crises is currently one of the most alarming global concerns. Owing to its significance, scholars assessed factors that improve such performance. However, such improvements in performance require public health employees' discretionary behavior. We investigate the impact of organizational citizenship behavior and patriotism on employee performance, shifting the focus of the healthcare industry's employee performance conversation to how it can be sustained. We used cross-section data from 541 Chinese public health employees who made up the final sample in this study, which has been shown to be appropriate for investigations utilizing a quantitative method. The results of our empirical analysis demonstrate that organizational citizenship behavior positively contributes to sustaining employee performance. We found the same to be true about the positive mediating effect of patriotism on the aforementioned relationship. The findings offer insights into how a country's performance at both local and international levels propels and sustains the job performance of its citizenry. Thus, governments should be more efficient and ensure they maintain a robust institutional environment. This study provides theoretical and empirical evidence based on a research survey of the roles of organizational citizenship behavior and patriotism that sustain employee performance in China's public health sector, in particular during health crises.

KEYWORDS
organizational citizenship behavior, patriotism, employee performance, public health, sustainability

Introduction

The increasing complexity of extreme events and their adverse effects on society has shifted the attention of scholars, governments, and organizations to strategically plan and counter future occurrences (Willis et al., 2021). The public health sector has received enormous pressure during extreme events such as the Ebola, SARS, and COVID-19 crises.

These crises have necessitated the unwavering devotion of health employees (Willis et al., 2021). Amidst several factors, employee performance accentuates factors that relate to the role of health employees in overcoming the dilemma of disease outbreaks. Depending on the context, employee performance refers to the task or role performance relating exclusively to the completion of a task specified in a job incumbent's task or job description (Pawar, 2013). In the literature, employee performance is one of the most important concerns for any organization (Motyka, 2018; Atatsi et al., 2019), and has been viewed as fundamental or in-role responsibility where employees are hired to perform in exchange for their compensation packages (Motyka, 2018; Atatsi et al., 2019). The importance accorded to employee performance has driven organizations' continuous design of activities and study of behaviors in employees that could be tapped to improve their performance (Stoffers et al., 2014).

Employee performance has been studied in various contexts, across diverse disciplines and cultures in the past decades, with the aim of understanding behaviors, concepts, and resources that promote performance (Atatsi et al., 2019). However, a review of the literature showed factors that improve performance rather than those that sustain it. Precisely, prior studies emphasized factors that enable organizations to take advantage of, exploit and invest in employees' physical, cognitive, and emotional capabilities. In this regard, research is required to provide insight into how employee performance can be sustained while taking into account prior emphases on issues such as employee burnout and role stress that develops when organizations focus on improving staff performance (Karatepe and Uludag, 2008; Prentice et al., 2013; Asgari et al., 2018; Virga et al., 2019; Lemonaki et al., 2021). Furthermore, due to the rise in lethal infectious diseases in recent decades and the critical role of public health personnel's performance, this research focus requires further inquiry.

Driven by this importance, we examine the effects of organizational citizenship behavior and patriotism on employee performance in the Chinese public health sector. Extant studies looked into a variety of factors that influence employee performance. Sampling some recent studies reveal the works of van der Kolk et al. (2019) and Napitupulu et al. (2017). van der Kolk et al. (2019) investigated the effects of various types of management controls on public-sector employee performance. The study used motivation crowding and self-determination theories to claim that personnel, culture, action, and results control affect employees' intrinsic and extrinsic motivation. These factors, according to the study, indirectly contribute to improved employee performance. Similarly, Napitupulu et al. (2017) investigated the impact of career advancement on public-sector employee performance. To strengthen this relationship, the authors investigated the mediating effects of perceived organizational support, job motivation, and affective commitment. They found that career development positively correlated with perceived organizational support, motivation, and affective commitment. Other assessments on enhancing employee performance revealed findings on employee burnout and role stress (Karatepe and Uludag, 2008; Prentice et al., 2013; Asgari et al., 2018; Virga et al., 2019; Lemonaki et al., 2021). To address this issue, the purpose of this study is to answer the following research questions: (1) How does health employees' organizational citizenship behavior sustain public health employees' performance during public health crises? (2) How does patriotism contribute to sustaining public health employees' performance during public health crises?

The present study's conceptualization shows that sustaining employee performance is essential to countering future epidemics that impose pressure on health service delivery. As a result, this study seeks to show that organizational citizenship behavior (which emphasizes extra-role and altruistic behaviors) and patriotism (which denotes an employee's love and devotion for his/her country) are factors that sustain public health employees' performance. Specifically, this study seeks to show the effect of health employees' sacrificial and extra-role behavior on sustaining performance during a public health crisis. Drawing on extreme events such as COVID-19, the present study emphasizes the value of patriotism as a facilitator of employees' willingness to perform tasks as a form of gratification for their country and the organization's superiority. The unflinching support of public health employees is influenced mainly by altruistic behaviors. Cumulatively, this behavior can contribute to the quality of healthcare delivery to victims of these extreme events. Therefore, a country's and public organization's management acknowledgment of the essential role of these factors would facilitate improvements at the organization and country level which indirectly impacts employees' extra-role and altruistic behaviors thereby sustaining employee health service delivery or performance during public health crises.

Organ (1988) defined organizational citizenship behavior as citizenship behaviors (altruism, conscientiousness, civic virtue, courtesy, and sportsmanship) that are not directly or openly acknowledged by formal incentives and that, when aggregated, support the company's success. Researchers have recognized organizational citizenship behavior as an essential factor of performance, and it has sustained traction in the organizational literature (Chen et al., 2018). As a result, we expect the behaviors, for instance, altruism and conscientiousness that lie at the discretion of employees to sustain their health crises tasks performance. On the other hand, patriotism is a term that denotes a person's emotional attachment to his or her country (Rupar et al., 2021). Prior studies emphasized that the core of patriotism is revealed in national and community leaders' efforts, as well as mass media information dissemination, to assist citizens in their patriotic duty to combat the health crises (Rupar et al., 2021). Thus, we expect patriotic personnel to provide unflinching service delivery during healthcare emergencies. Put together, organizational citizenship behavior and patriotism should act as triggers of employee commitment which contributes to sustained performance.

This study makes two contributions to the existing body of knowledge. Theoretically, we contribute to the literature on organizational citizenship behavior by revealing the positive sustaining impact of organizational citizenship behavior on employee performance. Precisely, we show that health employees' sacrificial and extra-role behaviors sustain performance during public health crises. In line with our assumption on the mediating role of patriotism, we enrich the literature by showing the conduit *via* which the link between organizational citizenship behavior and employee performance can be reinforced. Specifically, patriotism triggers employees' exchange behavior. Put together, this supports the social exchange theory's assertion that employees develop broad perspectives based on something given and reciprocate in a similar manner (Gouldner, 1960; Blau, 1964). In terms of empirical contribution, the study of Chinese public health employees' organizational citizenship behavior and patriotism joins the growing body of empirical research in China on health crises and the role of government and organizations. However, we provide fresh insight into the roles of organizational citizenship behavior and patriotism in sustaining employee performance rather than prior studies' central focus on the factors that improve it.

The subsequent sections of this study are organized as follows: Section 2 presents the theory and hypotheses. Section 3 reports the adopted methodology and how data were gathered. Section 4 presents data analysis. The final section presents the theoretical and empirical implications, limitations, and future research avenues and conclusions.

Theory and hypotheses

Social exchange theory

Social exchange theory provides a solid theoretical basis to understand how health employees' performance is sustained. This is based on the importance employees accord to their organization. Economic exchange and social exchange relationships are two forms of exchange relationships that exist under the umbrella of social exchange theory (Blau, 1964). Economic exchange relationships greatly emphasize financial and tangible rewards that define what is exchanged and when reciprocation occurs (Blau, 1964; Cropanzano and Mitchell, 2005). In contrast, social exchange relationships pertain to the exchange of socio-emotional resources that are long-term orientated and arise from the importance employees attach to the needs of the other party (Blau, 1964; Cropanzano and Mitchell, 2005). The basic tenet of social exchange is the reciprocity rule, in which something offered by one party triggers an obligation of the other to return something in a similar way (Gouldner, 1960; Blau, 1964). Social exchange theory also describes the interchange of tangible/intangible and material/nonmaterial products between individuals (Lambe et al., 2001) which are embedded in the relationship between an organization and its employees (Cook et al., 2013).

In the public sphere, four core concepts of social exchange theory are articulated: (1) social outcomes that are produced by exchange interactions; (2) outcomes that are compared to alternatives over time to determine the exchange relationship's dependence; (3) positive outcomes that increase trust and commitment over time; and (4) positive exchange interactions that produce relational exchange norms over time and governs the relationship (Martín Martín et al., 2018). In line with these core concepts, specifically, we propose that health employees having organizational citizenship behavior and patriotism engender feelings of obligation and trust which increases their commitment to the reciprocal rule (Gouldner, 1960; Blau, 1964). This is seen as unrelenting performance during health crises. Dominantly, social exchange theory has helped scholars establish insight into how employee exchange relationships resonate with the link between employee-level factors such as organizational citizenship behavior, leader-member exchange, employee trustworthiness, employee brand love, and employee performance (Cropanzano et al., 2017; Liaquat and Mehmood, 2017; Wang et al., 2019; Zhang et al., 2019; Wu et al., 2021). However, we lack insight into how social exchange theory unfolds in sustaining the relationships between organizational citizenship behavior, patriotism, and employee performance.

Through the lens of employee social exchanges (Cropanzano et al., 2017), our first hypothesis infers that health employees' organizational citizenship behavior are intangible resource interchange of health workers of an organization. Since the health service industry is our prime focus, the intangible exchanges would comprise a commitment to tasks and interaction between employees to accomplish tasks. As a consequence, severe health crises, for instance, the health sector's fight against the COVID-19 disease outbreak can be won through the lens of reciprocal offerings. Although during health crises, health employees' concern about their health at the workplace may impair their performance (López-Cabarcos et al., 2020; Mani and Mishra, 2020), their sense of belonging ensures an inerratic flow of exchanges for better performance. We propose that the exchanges capture the five dimensions of organizational citizenship behavior (Cropanzano et al., 2017). Accordingly, organizational citizenship behavior becomes an exchange revealed by, for instance, employees' devotion or stewardship, helping others to handle/accomplish assigned duties as well as exceeding their task performance levels during health crises.

Furthermore, to explain the mediating role of patriotism, we align the fundamental tenet of social exchange theory which emphasizes the reciprocity rule, in which something given triggers an obligation to return something equivalently (Gouldner, 1960; Blau, 1964). The effect of social exchange theory posits that health employees` love for their country is a source of emotions, and attempts to characterize the distinct emotional effects of different exchange structures to incorporate emotions as a core feature of social exchange processes, where a social exchange is conceptualized as a joint activity. Exchange outcomes produce emotions that vary in form and intensity, and can be either positive or negative. The theory predicts that the greater the shared responsibility, the stronger the emotions people will attach to the social units of the exchange. In service organizations, emotions influence how employees perceive and feel about their shared activity, their relationships, and their common group associations. According to the affect theory of social exchange, emotions are directed at the group context and are not limited to the service agent. In other words, the emotions resulting from social exchanges affect social relations, and a successful service encounter or relationship with a service employee will impact positively the entire service organization. Thus, patriotism becomes an exchange arising from employees' emotional attachment to their country's superiority. This emotional attachment would trigger the health employees' obligation to contribute something that positively affects their country's image. An avenue to do so is through the public health organization the employees serve. This idea is consistent with the social exchange theory's claim on employees' acceptance of "personal obligations, appreciation, and trust."(Blau, 1964).

Given these proposed inferences, this study seeks to extend research on how social exchange theory relates to sustaining public health employees' performance. We do so by emphasizing the connection between employees' exchange behaviors comprising organizational citizenship behavior and patriotism. Last, we seek to contribute to the theory by providing insight into how patriotism serves as an exchange mediation mechanism in the link between organizational citizenship behavior and employee performance which has not gained this theoretical validation.

Organizational citizenship behavior and employee performance

The concept of "organizational citizenship behavior" refers to a person's discretionary behavior that is not immediately or openly recognized by the formal incentive system but that, in the aggregate, aids the organization's effective functioning (Organ, 1988). Gary (2012) described organizational citizenship behavior as an employee's voluntary conduct to perform duties outside of his or her allocated responsibilities for the progress or profit of their organization. Typically, organizational citizenship behavior has been studied from five dimensions consisting of altruism, courtesy, conscientiousness, civic virtue, and sportsmanship (Organ, 1988). Altruism details the behavior of assisting others in completing tasks. Courtesy details behaviors based on job-related problems, such as supporting co-workers who work inefficiently. Sportsmanship denotes the behaviors such as accepting unfavorable and less-than-ideal conditions. Civic virtue describes responsible behavior to partake in corporate life activities. Conscientiousness emphasizes commitment to tasks and achieving results that exceed expectations.

We claim that organizational citizenship behavior explains public health personnel's maintaining commitment amid health crises when all five dimensions are taken into account. This is expected to unfold as follows: (1) we anticipate that altruism describes how health employees collaborate with their co-workers in completing tasks since such tasks are vital to their organization's successful control of a health crisis; (2) courtesy should capture sacrificial behaviors such as collaborating with inefficient co-workers to resolve task-related issues in the interest of ensuring their organization efficiently handles a health crisis; (3) sportsmanship would describe the willing of health employees to maintain their performance amid unfavorable conditions such as their organization's call for extra duties and working hours; (4) we expert civic virtue to take the form of employees unrelenting behavior to join corporate health agendas and taking actions to contain health crises; and (5) conscientiousness should be seen as health employees extra-role behaviors, for instance, as arising from their commitment that exceeds that performance quotas of their organization. Collectively, these assumptions resonate with earlier findings regarding the vital role of organizational citizenship behavior. For instance, organizational citizenship behavior has been emphasized as an absolute necessity in organizations and a system of collaboration and employees' willingness to contribute and work to a cooperative system. In another word, organizational citizenship behavior is defined as extra work-related behaviors that go beyond the standard responsibilities listed in job descriptions and are assessed through formal assessments. This shows that organizational citizenship behavior is crucial to an organization's process of reciprocal exchange and has a direct impact on employee performance (Sadeghi et al., 2016).

In light of the previous endorsement, it is obvious that earlier research has concentrated on elements that lead to sustained performance rather than on characteristics that contribute to employee engagement. Interestingly, Napitupulu et al. (2017)'s findings provide avenues for future investigations into how and what factors contribute to sustaining employee performance in the public sector. According to earlier research, stress has a detrimental effect on nursing performance, which, in turn, has a detrimental effect on patient care and eventually results in high death rates (Sveinsdottir et al., 2006). Employees are significantly more engaged in the organization and spend more time there when they have a significant chance of meeting their requirements (Foss et al., 2015).

Furthermore, disease outbreaks have become a reality in the administration of healthcare operations, as well as in modern human resources management, with direct repercussions on employee tasks and adaptive performance (Nemteanu and Dabija, 2021). Employee task performance in healthcare can be defined as a set of behaviors that are linked to the organization's goals and that each employee is responsible to accomplish. The recent global disease outbreak has pushed countries' health systems to the limit, with unknown consequences for health workers' task performance (Nemteanu and Dabija, 2021). Prior studies found several outcomes of organizational citizenship behavior, such as improved corporate productivity, maximized job effectiveness, and positive interaction between employees through active voluntary attitudes and behaviors (Rose, 2016; Gjurasic and Loncaric, 2018; de Geus et al., 2020). Similarly, organizational citizenship behavior enables an organization's core business's outstanding performance and catalyzes performance enhancements (Podsakoff et al., 2014). Prior studies reported other outcomes such as increased employee engagement in several industries such as the banking industry, hospitality industry, education, and service industry (Lyu et al., 2016; Zhang et al., 2017; de Geus et al., 2020). Thus, organizational citizenship behavior has been mainly linked to employees and organizational performance (Rose, 2016; Jiang et al., 2017). Given the role of organizational citizenship behavior, we expect unrelenting task performance during health crises. As a result, we suggest that:

> *Hypothesis 1:* Organizational citizenship behavior positively relates to sustaining public health employees' performance during public health crises.

The mediating effect of patriotism

This study posits that patriotism is an outstanding factor that propels health employees' organizational citizenship behavior to sustain employee performance. This proposition follows patriotism's emphasis on an individual's love and commitment to his or her country (Sekerdej and Roccas, 2016; Marzecki, 2020). Therefore, our argument on the possibility of sustaining health employees' performance is triggered by their love for their love which results in an unflinching commitment to their job roles during life-threatening events such as deadly epidemics. This study focuses on a more comprehensive multidimensional notion of employee patriotism. Indeed, research indicates that various forms of employee patriotism are associated with varying degrees of social participation (Rupar et al., 2021). Notably, patriotism, defined as an emotional attachment to one's nation, has been found to be an excellent predictor of time and effort invested in tasks that benefit the country (Sekerdej and Roccas, 2016) and various civic engagement activities (Rupar et al., 2021). Having a sense of belonging and personal duty toward one's home country and one's fellow citizens are indicative of patriotism in individuals. Accordingly, those who have a strong sense of national identity may have a greater sense of personal duty to act, which could, in turn, influence attitudes and behavioral reactions, including those connected to the COVID-19 situation (Everett et al., 2020). Individuals who have a strong sense of belonging to their country may also have a strong sense that the state is responsible for defending its inhabitants during a crisis. Individual responses aimed at preventing future harm have been demonstrated in previous research (Iqbal and Bilali, 2018), which suggests that acknowledging the responsibility of one's country is important. Consequently, not only does the sense of individual responsibility play a role in the issue, but also so does the sense of country or state accountability, which may help to explain the links between national identification, attitudes, and behaviors in the COVID-19 dilemma. In keeping with these findings, we anticipated that patriotism would be a strong or consistent predictor of attitudes and behaviors connected to a disease outbreak (e.g., COVID-19).

In the literature, patriotism is also emphasized as national identification which is an individual's emotional inclination to his/her country (Rupar et al., 2021). Patriotism has been studied in different spheres for instance in military sacrifice, politics, populace tax compliance, history, and during extreme events specifically its current occurrence in COVID-19-related studies. In addition, the essence of patriotism is revealed in the effort of national and community leaders and mass media information dissemination to facilitate citizens' patriotic duty to fight against the COVID-19 pandemic (Rupar et al., 2021).

The literature documented that patriotism comes in three forms comprising conventional, constructive, and glorification. Care, emotional attachment, and love toward one's country and people describe an individual's conventional patriotism (Sekerdej and Roccas, 2016). However, the literature posits that one's emotional attachment and love toward his/her country alone cannot represent patriotism. This shed light on the significant emphasis placed on the constructive and glorification forms of patriotism. The serious reflection, motivation, and devotion that influence an individual to work to better his/her country explain constructive patriotism (Sekerdej and Roccas, 2016). Constructive patriotism motivates individuals to participate in a variety of political and social activities that benefit their country and fellow citizens (Rupar et al., 2021). Additionally, constructive patriotism is forward-looking and is more likely to promote long-term goals (Rupar et al., 2021). Glorification is defined as a belief in the nation and state based on political and geographical traits (Leidner et al., 2010), and results in the formation of extrinsic group boundaries (Schatz, 2020). Also, a recent study found that glorification is associated with increased support for quick, short-term interventions (Rupar et al., 2021). Furthermore, glorification is associated with employee national conservatism (Jost et al., 2003), which is characterized by a reduced willingness to participate in acts that could affect the country, such as protests or avoiding not cooperating during major disease outbreaks. Thus, we anticipated that glorification would be associated with decreased support for such efforts and, as a result, with decreased rates of compliance with hygienic and social norms. Glorification patriotism details the love which is accompanied by unquestioning, blind devotion to one's nation's structures and policies, and one's thinking of the nation's superiority. Therefore, this study's argument regarding the mediating effect of patriotism is anchored on its three forms and its pivotal role in shaping employees' organizational citizenship behavior and performance. This also follows prior studies' emphasis on the effect of patriotism (national identification) in shaping behaviors and the need to consider studying the joint roles of the three forms of patriotism (Rupar et al., 2021; Figure 1). Based on these arguments, the proposed study hypothesizes that:

> *Hypothesis 2*: Patriotism positively mediates the relationship between organizational citizenship behavior and employee performance such that it sustains the relationship.

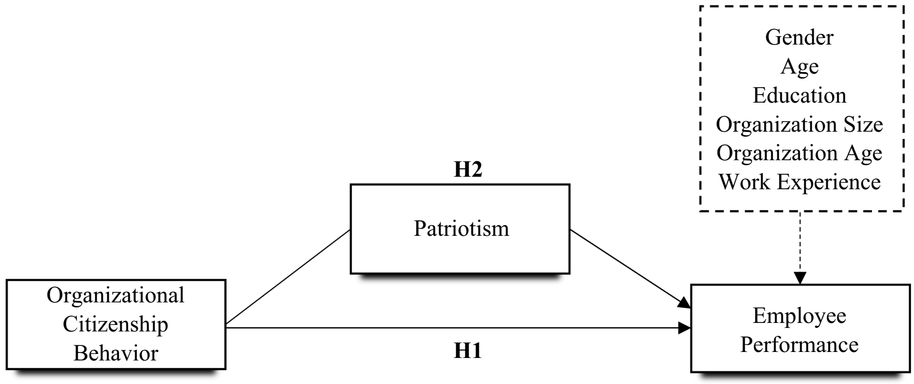

FIGURE 1
Research model.

Materials and methods

Sampling and data collection

The population sample of interest in this study was a cross-section of Chinese public health workers. The final sample was 541, which is proven suitable for studies using a quantitative approach (Hair et al., 2014). The sample consisting of health employees' organizations (e.g., hospitals) was gathered from a Chinese public organizations database. We used a questionnaire to gather the data from this sample. To determine our study participants, experts inside and outside the University of Science and Technology of China were consulted. After receiving the affirmation of the hospitals on data collection through the University of Science and Technology of China, the questionnaire was disseminated to the hospitals where the health employees were combating the COVID-19 disease outbreak and all the participants ensured that data were kept confidential and anonymous. We conducted a back-translation procedure following Brislin (1970) to translate the English questionnaire into a simplified Chinese script. Proposed an iterative procedure of repeated independent translation and back-translation by a translator team. This method necessitates the use of numerous independent bilingual translators (Triandis and Brislin, 1984). A bilingual translator blindly translates an instrument from the original language to the target language; a second bilingual translator independently reverses the translation from the target language to the original language. The two versions of the instrument (original language and back-translated version) are then compared for concept equivalence. When an error in the back-translated version is discovered, another translator retranslates the item. This process is repeated until a team of bilingual translators determines that the two versions of the instruments are identical and include no grammatical problems. The translation team was made up of three purposefully selected professors from the authors' university, including two Ph.D. students were had a mastery command of the English and Chinese Mandarin languages.

Furthermore, the Chinese version was tested on five Chinese public health officials, and the questionnaire was readjusted based on their feedback. Along with this procedure, our Chinese-translated questionnaire was equivalent to the English version. The final questionnaire consisted of four main parts: (1) sample demographic information; (2) questions related to employees' organizational citizenship behavior; (3) questions related to employees' patriotism; and (4) employee performance. To avoid ambiguity and response bias, each section of the questionnaire was preceded by instructions (Podsakoff et al., 2003). Respondents were assured that there were no right or wrong answers and that all responses would be treated with the utmost confidentiality. The survey lasted for 5 months from August 2021 to December 2021, during which questionnaires were administered online using e-mail and WeChat.

We engaged and used 541 valid responses to empirically test this study's proposed relationships. To arrive at these valid responses, we included several "trap" questions, asking about their OCB experience during the COVID-19 crisis. In particular, we added the following: "*I have helped my other co-health workers who have been absent during the COVID-19 crisis*"; *and* "*During the past 8 months, I have voluntarily helped other co-health workers during the COVID-19 crisis*." The logic behind asking these questions was to check whether a respondent was paying attention while answering the survey and the consistency of their answers. To ensure the suitability of our sample size, we conducted a sample adequacy test. This assessed how the factors linked to one another (the strength of the partial correlation between variables; Kaiser, 1974). As shown in Table 1, the Kaiser-Meyer-Olkin Measure (KMO) value of 0.896 met the threshold of >0.50, implying that the sample size is sufficient to test the study's hypotheses. Furthermore, regarding our sample demographic statistics, 54.5% of the 541 valid responses were female and 45.5% male. Table 2 reports the sample statistics in detail.

Measurement scale

All constructs were measured following prior studies published in social sciences citation index (SSCI) journals.

TABLE 1 Sample adequacy test.

KMO and Bartlett's test, $N = 541$		
Kaiser-Meyer-Olkin measure of sampling adequacy		**0.896**
Bartlett's test of sphericity	Approx. Chi-square	29250.906
	df	990
	Sig.	0.000

KMO value is significant at >0.50. KMO value bolded.

TABLE 2 Sample properties – *N*=541.

Variable	Category	Frequency	Percent
Gender	Male	246	45.5
	Female	295	54.5
Age	18–24	94	17.4
	25–34	209	38.6
	35–44	157	29.0
	45–54	62	11.5
	55–64	19	3.5
Education	Diploma	80	14.8
	Bachelor	327	60.4
	Masters	128	23.7
	Doctorate	6	1.1
Organization Age	0–10	331	61.2
	11–20	140	25.9
	21–30	47	8.7
	31–40	15	2.8
	41–50	7	1.3
	51+	1	0.2
Organization Size	Small (10–49)	389	71.9
	Medium (50–249)	127	23.5
	Large (above 250)	25	4.6
Working Experience	Less than 2 years	106	19.6
	3–5 years	150	27.7
	6–10 years	79	14.6
	Greater than 10 years	206	38.1

Organizational citizenship behavior

Organizational citizenship behavior (OCB) was measured using 14 items (Angeles Lopez-Cabarcos et al., 2020). For instance, the items measuring organizational citizenship behavior are (1) I helped health employees who have heavy workloads; (2) I helped orient new health employees even though it is not required; and (3) I have helped my other co-health workers who have been absent during COVID-19 crisis.

Patriotism

Patriotism was measured following the works of Roccas et al. (2006) and Sekerdej and Roccas (2016). An aggregate of eight items measured patriotism. Patriotism is a high-level construct with three low-level dimensions comprising conventional, constructive, and glorification. The items were refined to fit the context of the current study and assessed by experts. Three items measured the conventional dimension of patriotism. Sample items are (1) I like China; (2) I love my country; and (3) the fact that I am Chinese is an important part of my identity. In addition, the constructive dimension of patriotism had three items: (1) I oppose some policies because I care about my country and want to improve it; (2) I express my attachment to China by supporting efforts aimed at positive change; and (3) People should work hard to move this country in a positive direction. Two items measured the glorification dimension of patriotism. Sample items are (1) my nation is better than other nations in all aspects and (2) it is disloyal to criticize China.

Employee performance

We adapted 23 items from the work of Pradhan and Jena (2016) to measure employee performance. The items were refined to fit the context of health employees and thoroughly assessed by experts. For instance, (1) I use to maintain a high standard of work during public health crises; (2) I use to perform well to mobilize collective intelligence for effective teamwork to overcome during public health crises; and (3) I used to extend help to my co-health workers when asked or needed. These three items indicate the three dimensions of employee performance: task performance, adaptive performance, and contextual performance, respectively. Each of these measurement items was rated on a 7-point Likert scale ranging from 1 = strongly disagree to 7 = strongly agree. As shown in Table 2, gender, age, education, work experience, organization age, and organization size were controlled in this study due to their influence on employee task performance (Pradhan and Jena, 2016).

Data analysis and results

Exploratory factor analysis

Exploratory factor analysis (EFA) was used in this study to determine the reliability, convergent, and discriminant validity of constructs/items using SPSS software version 24. As shown in Table 3, the Cronbach's alpha (CA) coefficient estimated the reliability of all constructs. The Cronbach's alpha of organizational citizenship behavior, patriotism, and employee performance was 0.903, 0.874, and 0.951, respectively, which indicated that the reliability of the whole items was above the cutoff point of 0.70 for significance (Hair et al., 2017). In addition, all constructs' average variance extracted (AVE) values were above the cutoff point of 0.5, indicating that these constructs had acceptable convergent validity (Hair et al., 2017). The final constructs' validity test compared the AVE of each variable/construct with the square of their respective correlation coefficient. The AVE values were found to be higher than the square of the correlation coefficient, which inferred that discriminant validity met the recommended requirement (Fornell and Larcker, 1981). To improve the scale validity, constructs/items with loadings below the recommended threshold of 0.60 (Hair et al., 2010) were eliminated during the analyses.

TABLE 3 Constructs/items measurement properties.

Organizational citizenship behavior		CA	CR	AVE
OCB2	0.721	0.903	0.938	0.628
OCB3	0.826			
OCB4	0.798			
OCB5	0.848			
OCB7	0.749			
OCB9	0.723			
OCB10	0.691			
OCB12	0.879			
OCB13	0.873			
Patriotism		0.874	0.921	0.626
CPA1	0.765			
CPA2	0.719			
CPA3	0.687			
CPB1	0.861			
CPB2	0.814			
CPB3	0.852			
CPC1	0.823			
Employee performance		0.951	0.979	0.676
TP1	0.862			
TP2	0.753			
TP3	0.907			
TP4	0.832			
TP5	0.729			
TP6	0.819			
AP7	0.883			
AP8	0.869			
AP9	0.799			
AP10	0.800			
AP11	0.833			
AP12	0.822			
AP13	0.804			
CP14	0.786			
CP15	0.897			
CP16	0.814			
CP17	0.792			
CP18	0.746			
CP19	0.851			
CP20	0.745			
CP21	0.745			
CP22	0.848			
CP23	0.932			

Common method bias and multicollinearity analysis

Further robustness checks focused on assessing common method bias and multicollinearity issues. The study used Harman's one-factor test to eliminate the risk of common technique bias (Podsakoff et al., 2003). A common technique bias emerges when a single factor accounts for more than 50% of the variance (Harman, 1967). The statistical results obtained were below the recommended cutoff point of 50% (Harman, 1967). Another way to assess common method bias is to use the variance inflation factor (VIF) to check for multicollinearity among constructs. The resultant highest VIF value of 4.682 was less than the threshold value of 10% (Neter et al., 1990). As a result, no common method bias and multicollinearity are not a problem in our study.

Descriptive statistics and bivariate correlation analysis

The strength of the linear association between organizational citizenship behavior, patriotism, and employee performance was determined using Pearson's bivariate correlation analysis. Table 4 reports the statistically significant relationship among all variables.

Hypotheses testing

The two hypothesized relationships were tested through four hierarchical regression models, as shown in Table 5. In all four models of the analysis, employee performance was the dependent variable. All controlled variables were entered in all four regression models following prior studies' endorsements of their possible influence on employee performance. Model 1 calculated the effect of the control variables on employee performance. Statistically significant values were obtained for the control variables: education, organization age, and organization size except for age, gender, and work experience. In Model 2, the regression coefficient ($\beta = 0.436$, $p < 0.001$) showed a positive relationship between organizational citizenship behavior and employee performance. This infers that this study's *Hypothesis* 1 is valid. Model 3 reports the result ($\beta = 0.158$, $p < 0.001$) obtained for the effect mediating of patriotism on the relationship between organizational citizenship behavior and employee performance. The result demonstrated that *Hypothesis* 2 is true. Model 4 estimated the interaction effect: organizational citizenship behavior and patriotism (OCB x P). We had statistically significant interaction effects for this estimation. This further validated *Hypotheses* 2.

To further validate the mediation effect of patriotism, we employed the step-by-step instructions recommended by Zhao et al. (2010). This mediation approach is more appropriate since it corrects the constraints associated with previous mediation analytical procedures. Zhao et al. (2010) demonstrated that the significance of the indirect effect of a x b three-variable causal model is the only prerequisite for predicting mediation. This eliminates the necessity for an initial test of the significance of the X-Y variables. Other researchers, for instance, Rucker et al. (2011) stated that a significant link between X and Y is not required for assessing mediation. Zhao et al. (2010) also suggested that the bootstrapping technique is more appropriate to calculate the significance of a × b three-variable causal model. Along with this insight, this study estimated the strength of the mediation effect of patriotism on the link between organizational citizenship behavior and employee performance. Table 6 reports the acceptable results of the bootstrapping technique.

TABLE 4 Descriptive statistics and correlations.

Variables	1	2	3	4	5	6	7	8	9
Gender	1								
Age	−0.183**	1							
Education	0.214**	−0.161**	1						
Organization Age	−0.266**	0.260**	0.040	1					
Organization Size	−0.136**	0.114**	0.125**	0.307**	1				
Working Experience	−0.172**	0.877**	−0.063	0.315**	0.094*	1			
OCB	−0.156**	−0.154**	−0.094*	0.094*	0.045	−0.123**	1		
P	−0.009	0.002	0.039	0.079	−0.056	0.058	0.317**	1	
EP	−0.051	−0.105*	−0.051	0.081	0.085*	−0.118**	0.449**	0.267**	1
Means	1.55	2.45	2.11	1.58	1.33	2.71	5.30	5.71	5.03
SD	0.498	1.018	0.646	0.882	0.560	1.167	1.098	0.978	0.937
VIF	1.179	4.682	1.157	1.293	1.154	4.659	1.218	1.149	

N = 541; **Correlation is significant at the 0.01 level (2-tailed). *Correlation is significant at the 0.05 level (2-tailed). OCB, organizational citizenship behavior; P, patriotism; EP, employee performance.

TABLE 5 Hierarchical linear regression.

	Employee performance (dependent variable)				
Variables	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Interpretation**
Controls	*β*	*β*	*β*	*β*	
Gender	−0.027	0.034	0.027	0.025	
Age	−0.052	0.065	0.079	0.078	
Education	−0.075*	−0.026	−0.037	−0.017	
Organization Age	0.105**	0.058	0.050	0.062	
Organization Size	0.076*	0.061	0.076*	0.076*	
Working Experience	−0.122	−0.141*	−0.170**	−0.155**	
Main Effect					
Organizational Citizenship Behavior		**0.436*** **	0.383***	1.110***	H1 supported
Mediator					
Patriotism			**0.158*** **	0.706***	H2 supported
Interaction					
OCB x P				1.046**	
R^2	0.040	0.215	0.237	0.250	
Adjusted R^2	0.029	0.205	0.225	0.237	
F	3.700***	20.857***	20.613***	19.622***	

N = 541; $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.001$. OCB, organizational citizenship behavior; P, patriotism. Hypotheses testing coefficients are bolded.

TABLE 6 Mediation analysis.

Path	Estimate	95% confidence interval		Result
		Lower level	Upper level	
OCB → P → EP	0.0440	0.0207	0.0706	Supported

OCB, organizational citizenship behavior; P, patriotism; EP, employee performance.

Discussion

Theoretical and empirical implications

The goal of this study was to examine the roles of organizational citizenship behavior and patriotism in sustaining public health employees' performance during health crises. Throughout the COVID-19 disease outbreak, hospital staff encountered a range of challenges, including a significant work overload that impairs their capacity to perform in hospitals (Aguiar-Quintana et al., 2021). Health workers are a critical component and play a vital role in the delivery of healthcare to patients in both public and private hospitals. While China's public hospitals are now more overcrowded than usual due to the COVID-19 outbreak, the chaos has deleterious effects on healthcare employees' work performance, such that it places significant pressure on healthcare employees' work performance. Prior investigations and discoveries on the factors that improve employee performance have been driven to an extent by this fundamental focus (Napitupulu et al., 2017; van der Kolk et al., 2019). Despite the importance of those contributions, some studies found that improving employee performance leads to employee role stress, burnout, and turnover (Karatepe and Uludag, 2008; Prentice et al., 2013; Asgari et al., 2018; Virga et al., 2019; Lemonaki et al., 2021). In light of this, we conducted a literature review and discovered fewer insights into factors that sustain employee performance. In this effect, we posed the research questions: (1) How does health employees' organizational citizenship behavior sustain public health employees' performance during public health crises? (2) How does patriotism contribute to sustaining public health employees' performance during public health crises? These questions were addressed in light of recent rapid health crises and the increased focus on the health sector's performance (Willis et al., 2021).

To address this gap, this study conceptualized that organizational citizenship behavior and patriotism are factors that can help employees sustain performance in the healthcare industry. To be more precise, this study focuses on the interaction of employees' organizational/national level characteristics that automatically instill a desire in employees to continue providing excellent service despite their fear of negative repercussions, for instance, the perceived risk associated with COVID-19 (Yu et al., 2021). Emphasis is placed on active and voluntary attitudes and behaviors of employees to enhance organizational productivity (Kim et al., 2013). Organizational citizenship behavior enhances organizational productivity, increases job effectiveness, and maximizes positive interaction between employees through active and voluntary attitudes and behaviors of employees (Kataria et al., 2012). Overall, considering the characteristics of organizational citizenship behavior, it can be established that organizational citizenship behavior enables outstanding performance, thus, can serve as a sustaining mechanism of employee performance. Chiaburu et al. (2013) indicated that organizational citizenship behavior induces: helping, taking charge, and creative behavior. Specifically, helping means supporting the work of fellow employees and sharing necessary information, taking charge implies pursuing change and innovation, while creative behavior involves presenting creative ideas for the organization. Along with this insight, this study's proposed relationships were tested to ascertain whether it echoes the prior assertions above.

Theoretically, the results validated this study's hypothesis that organizational citizenship behavior sustains employee performance as well as the positive mediating effect of patriotism. Both organizational citizenship behavior and patriotism had the same strong positive effect on employee performance. These findings make contributions to the organizational citizenship behavior literature on the beneficial role of health employees' citizenship behavior revealed as altruism, courtesy, conscientiousness, civic virtue, and sportsmanship behaviors (Organ, 1988; de Geus et al., 2020). In addition, this finding can explain public health employees' unwavering service delivery during extreme events such as Ebola, Influenza, SARS 2003, and COVID-19 (Rupar et al., 2021).

Following the recommendation of prior studies on the need to investigate the combined influence of the three components of patriotism (Rupar et al., 2020, 2021), we add to the literature by identifying patriotism (conventional, constructive, and glorification) as a facilitator of public health employees' willingness to maintain performance during health crises. Last, the favorable effects of organizational citizenship behavior and patriotism contribute to the literature on how employee performance can be sustained (maintained productivity) rather than improved (increased productivity; Atatsi et al., 2019). Overall, this insight lends credence to social exchange theory's emphasis (four core principles) on the essence of employee social exchanges and its outcomes (Martín Martín et al., 2018). We elaborate on this study's contribution to the social exchange theory in two ways. First, no study has provided insight into how the social exchange theory (Blau, 1964; Cropanzano and Mitchell, 2005) affects employee sustained performance. Although prior studies emphasized the factors responsible for employee performance (Cropanzano et al., 2017; Liaquat and Mehmood, 2017; Wang et al., 2019; Zhang et al., 2019; Wu et al., 2021), the literature lacks insight into how social exchange theory unfolds in sustaining the relationships between organizational citizenship behavior, patriotism, and employee performance. Thus, we extend the social exchange theory (Blau, 1964; Cropanzano and Mitchell, 2005) by identifying organizational citizenship behavior and patriotism as what employees offer in exchange for the value of their organization and country.

Second, the mediating effect of patriotism further provides fresh insight into the mechanism *via* which the sustaining effect of organizational citizenship behavior on employee performance is strengthened. This proposition follows patriotism's emphasis on an individual's love and commitment to his or her country (Sekerdej and Roccas, 2016; Marzecki, 2020). Accordingly, health employees who have a strong sense of national identity may have a greater sense of personal duty to act, which could, in turn, influence attitudes and behavioral reactions, during the COVID-19 situation (Everett et al., 2020). Although there is ample evidence of the positive relationship between organizational citizenship behavior and employee-related performances (Rose, 2016; Gjurasic and Loncaric, 2018; de Geus et al., 2020), no evidence exist about how it is sustained and the black box mechanisms that mediate this nexus.

Empirically, the utilization of Chinese health practitioners in this study provides empirical evidence to explain the performance of the Chinese health sector from the perspective of the positive contributory effect of organizational citizenship and patriotism, which received no research attention. Precisely, we show that when Chinese health employees engaged in organizational citizenship behavior and patriotism they stay committed to their tasks regardless of the unfavorable conditions they face during health crises. These behaviors: organizational citizenship behavior and patriotism are what they offer to sustain performance. These findings have practical implications for healthcare executives as well as national governments. First, managers of organizations should place a premium on health employees' intrinsic job satisfaction to increase their organizational citizenship behavior. Rather than delivering extrinsic rewards, managers should provide intrinsic benefits (e.g., job meaningfulness, job responsibilities, and job challenge) and work to boost employees' sense of intrinsic happiness. Finally, maintaining employees' patriotism should be a top concern for the government *via* an effective institutional role in national growth. This should serve as a long-term support system for employees' employment performance. As a result, robust policies, programs, and other crucial resource allocations should be the hallmark of government. Such prioritization should include a national health-crisis preparedness strategy to impact the performance of healthcare employees.

Limitations and suggestions for future research

The limitations of this study include its cross-sectional design which prevents us from concluding the causal relationships among the studied variables and how the sustainability of employee performance can be measured over a time frame. Future research should employ other data types (time series/panel). Also, our sample was limited to the Chinese context which may limit the generalizability of the results. Due to similar adverse effects of deadly diseases and the essential role of health employees' performance, comparative analyses could be conducted to understand the similarities and differences across countries using these data types. Collectively, this approach would help generalize results. In addition, scholars could examine additional variables to broaden understanding. Specifically, further research could be directed toward the exploration of potential moderators, such as those related to the organizational context, as well as other contextual factors such as cultural and institutional dimensions of China in the link between organizational citizenship behavior and employee performance. These could be addressed from two standpoints. First, this study's arguments were centered on employees' sustaining exchanges arising from their organizational citizenship behavior and patriotism. As a result, we begin a conversation about understanding factors that sustain employees' performance rather than ones that enhance it. Thus, future research could assess how human resource and organizational behavioral factors, for instance, leadership inclusive behavior; good management and leadership; perceived organizational support; and a good working environment sustains employee performance. Second, the cultural dimensions of high collectivism, power distance, and high preference for avoiding uncertainty are different from those of individualist societies. Subsequent research should be carried out in contexts dissimilar to China to improve the generalization of our findings.

Conclusion

This study assessed the effect of organizational citizenship behavior and patriotism on employee performance. The empirical analysis used 541 Chinese public health employees to validate the effect of these factors. The primary focus has influenced earlier research and discoveries on the elements that boost employee performance to some extent (Napitupulu et al., 2017; van der Kolk et al., 2019). Despite the value of those efforts, some research revealed that elevating employee performance causes job stress, burnout, and turnover (Park et al., 2020). As a result, we reviewed the literature and found fewer insights into the variables that support employee performance. This study developed the concept that organizational citizenship behavior and patriotism are elements that can support employees' performance in the healthcare sector. To be more specific, this study focuses on the interaction of employees' overall organizational characteristics that inevitably instill a desire in employees to continue offering outstanding service despite their fear of adverse consequences, for instance, the perceived risk associated with COVID-19 (Özlü et al., 2022). We found a strong positive impact of organizational citizenship behavior and patriotism on employee performance. In line with the social exchange theory, we established these connections. Consequences in practice shed light on peak performance in organizations and governments to ensure that the investigated factors continue to impact employee tasks performance amid national health crises. This study contributes to the related literature on factors that sustain employee performance during health crises rather than existing research's focus on its improvement. Following the employment of a cross-sectional design, conceptual model, and measuring items in this study, recommendations for future research are reported.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The patients/participants provided their written informed consent to participate in this study.

Author contributions

MR and EH contributed to the conception and design of the study. MR wrote the abstract, theory, and hypothesis sections. EH wrote the introduction, discussion, and conclusion sections. ZG and NA organized the data collection, conducted the statistical analysis, and handled the methodology and data analysis. MR, EH, ZG, and NA partook in proofreading and revision of the paper. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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A configurational approach to leadership behavior through archetypal analysis

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The behavioral approach to leadership, which has introduced leadership styles, has been of great importance to the leadership field. Despite its importance, scholars have recently argued and demonstrated that these styles have various conceptual, methodological, and empirical limitations that could hamper further development of the leadership field. Consequently, they have called for alternative approaches to study leadership. We argue that taking a configurational or person-oriented approach to leadership behavior, which focuses on ideal-type configurations of leadership behaviors to identify leadership archetypes, offers such an alternative. We demonstrate the potential of such an approach *via* the use of archetypal analysis, for a dataset of 46 behaviors across 6 leadership styles, including more than 150,000 respondents. Our results offer a clear indication for the existence of archetypes of leadership. We also suggest how the resulting archetypes can get a meaningful interpretation, and discuss implications for future research.

KEYWORDS

person-oriented approach, archetypal analysis, configurations, leadership styles, archetypes

1. Introduction

The introduction of the behavioral approach to leadership has greatly advanced our understanding of leader effectiveness (House and Aditya, 1997; Judge et al., 2004; Yukl, 2013). The behavioral approach advocates that leadership is best understood by deconstructing leaders into, various, separate leadership styles. Since the introduction of this approach, scholars have been measuring leadership behaviors *via* a range of leadership styles. Examples are the classic styles "initiating structure" and "consideration" (Stogdill, 1950) or transactional and transformational leadership (Burns, 1978), but also more recently developed styles like authentic, ethical, and servant leadership (Dansereau et al., 2013; Dinh et al., 2014).

Research shows that leadership styles relate to several leader and follower outcomes (e.g., Judge et al., 2004; Judge and Piccolo, 2004; Van Dierendonck et al., 2014; Banks et al., 2016). Meta-analytic studies also indicate that leadership styles are crucial predictors of leader effectiveness (Judge et al., 2004; Judge and Piccolo, 2004; Ceri-Booms et al., 2017; Banks et al., 2018). Furthermore, different leadership styles add unique variance in explaining leader effectiveness (DeRue et al., 2011). Accordingly, both research and practice have studied extensively how the adoption of distinct leadership styles can maximize the effectiveness of (future) leaders (Avolio et al., 2009; Day et al., 2014).

But despite their importance and prevalence, scholars have identified various conceptual, methodological, and empirical limitations of such well-established behavioral leadership styles (Yukl, 1999; Van Knippenberg and Sitkin, 2013; Fischer and Sitkin, 2022). These limitations include a substantial empirical overlap both within and between these styles (Judge and Piccolo, 2004; Avolio and Gardner, 2005; Van Dierendonck et al., 2014; Banks et al., 2016), a lack of integration (Yukl, 1999; Van Knippenberg and Sitkin, 2013; Antonakis and House, 2014), and a focus on individual rather than configurations of styles (Yukl, 2012). The substantial empirical overlap across different leadership styles also makes theory building unnecessarily complex (Banks et al., 2016).

The meta-analysis of DeRue et al. (2011) shows a significant amount of empirical overlap between different leadership behaviors, leading the authors to conclude: "given the empirical similarities between leader behaviors found in this study, we encourage scholars to develop new or revised existing measures of leader behaviors such that we can better capture the conceptual distinctions among leader behaviors" (DeRue et al., 2011, p. 38). Banks et al. (2018) used meta-analytic correlations to confirm that construct redundancy remains problematic for the field of leadership. Next to construct redundancy, and based on a comprehensive assessment of the 10 most prominent leadership styles, Fischer and Sitkin (2022) conclude that the main problem of these leadership styles is that they all mix "the description of the content of leadership behaviors with the evaluation of their underlying intentions, quality of execution, or behavioral effects" (2022, p. 1). Their proposed way forward is to study leadership styles in a configurational manner.

The discussion about conflated leadership styles in leadership research relates to a fundamental debate in organizational and psychological science at large (Fiss, 2007; MacDougall et al., 2014; Bogat et al., 2016; Foti and McCusker, 2017), which is the distinction between a variable-and a person-oriented approach (Block, 1971; Bergman and Magnusson, 1997; Foti and Hauenstein, 2007; Scheuer et al., 2022). A variable-oriented approach assumes that the respective variables are different from each other. For leadership research, such an approach is problematic because the variables concerned, namely leadership styles, show a strong overlap. Also, and almost by definition, every person and thus leader is imperfectly defined by just a set of distinct leadership styles. In this sense, the call for a person-oriented approach where the person is the focal point, seems especially relevant for the field of leadership (Foti et al., 2012; Foti and McCusker, 2017; Scheuer et al., 2022). More generally, this call fits in what has been labeled as a "paradigm shift" in organizational research, because the person-oriented approach truly offers a new and different approach of investigating organizational questions (Woo et al., 2018).

Our paper aims to show how to use such a configurational or person-oriented approach and to which actual configurations it gives rise. We do so by using a large dataset of more than 150,000 respondents and 46 behaviors of leaders. We build configurations by applying archetypal analysis. Archetypal analysis is a classification method in which "archetypes" can be derived from combined behavioral configurations. This method is related to the pattern approach to leadership that takes the individual leader as holistic entity (Fiss, 2007; Foti et al., 2012; Scheuer et al., 2022) as the focal point of the analysis. So, our specific research question to answer is whether we can arrive, through archetypal analysis, at meaningful configurations of leadership behaviors.

Our configurational approach by means of archetypal analysis leadership behaviors offers three contributions. First, by applying archetypal analysis to a large data set that encompasses more than 150,000 managers across multiple countries, we respond to the call for a configurational or person-oriented approach in the leadership field. In doing so, we offer an alternative to study leadership behavior that addresses the conceptual and empirical limitations of current behavioral approaches (Fischer and Sitkin, 2022). Second, we show that, at least in our sample, the resulting archetypes are distinct from (the sum of) the separate underlying leadership styles, and thereby that an archetype indeed can offer a more holistic and at the same time more comprehensive perspective on leadership than separate leadership styles (Fiss, 2007; Foti et al., 2012; Fischer and Sitkin, 2022). Such a holistic approach seems particularly useful in times, like the current ones, where the degree of volatility and uncertainty confronting organizations and their managers is substantial. Instead of relying and using an ever-increasing number of fixed leadership styles, a different and more flexible perspective is needed to characterize leader behavior, which is a call for more agile or adaptive leadership approaches. Third, by applying the method of archetypal analysis, we empirically illustrate how our configurational approach can indeed lead to conceptually meaningful leadership archetypes. Such archetypes can be helpful to guide leaders and their organizations in contexts that are highly volatile, uncertain, complex and ambiguous.

In the remainder of this paper, we will first explain the characteristics of a configurational approach to leadership. Next, we will briefly discuss what archetypes and archetypal analysis are. We are then in a position to empirically demonstrate the potential use of archetypal analysis for the field of leadership, by using a dataset of 46 behaviors across 6 leadership styles. We find evidence for three archetypes, and these resulting archetypes can be defined along two main dimensions in our view. By means of a regression analysis we show that these archetypes are related to, but crucially also are distinct from, the underlying six leadership styles. The

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paper ends with a conclusion and discussion section, and presents avenues for future research.

2. Theoretical framework

2.1. Configurations of leadership

Conceptually, the call for the development of possible leadership configurations is not new among leadership scholars (see Fleishman et al., 1991; Yukl, 1999; Morgeson et al., 2010). Already in the 1960s, Blake and Mouton (1964) introduced the so-called Managerial Grid, which is based on the idea that there are five "types" of leaders, based on the combination of two seminal leadership styles, namely concern for task and concern for people. Also, the idea of so-called leadership "archetypes" has been suggested before in the leadership literature by leadership scholars, see for instance Kets de Vries et al. (2010) and Yukl (2013).

Nevertheless, one of the key features of virtually all leadership studies is that they investigate one or only a very few leadership styles. This approach raises two main concerns. First, by reducing individuals to one or more separate leadership styles, these studies fail to acknowledge that leaders can display various behaviors simultaneously (Yukl, 2012). Second, we also know that considering leadership styles in isolation may yield invalid estimates (Antonakis et al., 2010; Antonakis and House, 2014), with seemingly strong and reliable effects potentially disappearing when controlling for multiple leadership styles (e.g., Judge and Piccolo, 2004; Banks et al., 2016).

Given these two concerns, scholars have called for a critical investigation into the use of current leadership styles (Yukl, 1999; Dansereau et al., 2013; Van Knippenberg and Sitkin, 2013; Antonakis and House, 2014; Banks et al., 2016; Fischer and Sitkin, 2022), and for using alternative approaches to study leadership behavior. As argued by Fischer and Sitkin (2022), studying configurations of leadership is one way to address these concerns. Configurations reduce theoretical complexity, by integrating overlapping and separate leadership styles (Fleishman et al., 1991), thereby leaving room for a more parsimonious analysis that is focused on the core elements of the resulting configuration (Fiss, 2007; Delbridge and Fiss, 2013; Snow and Ketchen, 2014). Moreover, it allows to effectively and efficiently consider more intricate leadership behaviors that would be difficult to establish by considering only (the interaction between) individual leadership styles.

To date, there have been a few attempts to empirically arrive at configurations of leadership behavior. O'Shea et al. (2009) studied leadership patterns for the combination of transformational and transactional leadership. In their paper, predefined patterns are developed based on the combination of these leadership styles, leading to typical "high-high" or "high-low" combinations (see also Scheuer et al., 2022). In a similar vein, Arnold et al. (2017) applied a person-oriented approach to the same leadership styles. However, these studies use a pattern analysis which is still based on the combination of a few styles, and not on all the underlying individual behaviors. This last observation is also true for the pattern analysis of (self and ideal) leadership perceptions in Foti et al. (2012), where confirmatory factor analysis and latent profile analysis are employed in order to find patterns of individual traits in self and ideal leader profiles.

We thus need other approaches to reach meaningful leadership configurations. When it comes to the actual configurations employed, and without being restricted to a pre-determined limited set of leadership styles, we propose that, compared to other clustering techniques, archetypal analysis is such a promising approach. Primarily this is the case because archetypal analysis offers a configurational approach that is not based on some averaging technique of groups or clusters of observations, but instead on actual individual leadership behaviors instead of leadership styles in the data set. Before we turn to our actual application, we will first elaborate on the characteristics of archetypal analysis.

2.2. Empirically classifying archetypes through archetypal analysis

Archetypal analysis characterizes observations in a data set as convex combinations of extremal points, which allows all other observations to be described as a mixture of these extremal points. An everyday analogy is the phrase "There's a little bit of _____ in everyone." Given a dataset, archetypal analysis identifies those unique characteristics, the mixture of which makes up all the observed types, and estimates the proportion of all characteristics in each observation.

Thus, archetypal analysis shares characteristics with commonly used clustering techniques as well as dimensional reduction techniques like principal components. But it differs from these more standard clustering techniques such as cluster analysis or factor analysis, in a sense that archetypal analysis identifies different archetypes in the data based on extreme behavioral configurations of individuals (here, leaders). It determines for each individual case how close this individual is to each of these extreme archetypes, and is therefore a novel example of a configurational approach. Whereas these more standard data reduction techniques focus on the similarity between groups of observations, archetypal analysis emphasizes the boundaries of a data set. In layman's terms, archetypal analysis allows to identify different archetypes based on extreme individual behavioral configurations, and assigns a proximity score to these archetypes for each individual observation. In doing so, archetypal analysis is a prime example of the configurational or person-oriented approach (Foti and McCusker, 2017).

In addition to the advantages of ideal-type configurations as mentioned above, the data-driven approach of archetypal analysis enables the identification of archetypes without a theoretical prior, which is advantageous given that the field of leadership is thus characterized by a plethora of different, overlapping theoretical models and meta-categories (Van Knippenberg and Sitkin, 2013; Banks et al., 2016, 2018; Fischer and Sitkin, 2022). Archetypal analysis already has been used in various academic fields to identify patterns of functional vision loss (Elze et al., 2015), extreme performers (Porzio et al., 2008), usage and assessment of online courses (Kazanidis et al., 2016), published scientists (Seiler and Wohlrabe, 2013), and extreme climate and weather patterns over time (Steinschneider and Lall, 2015). In an international business setting, archetypal analysis has been used to analyze patterns of multiple cultural dimensions (Venaik and Midgley, 2015; Richter et al., 2016; De Wit, 2021), Building on these recent applications and the developments they have sparked in their respective fields, we therefore introduce archetypal analysis to the field of leadership research by applying archetypal analysis to leadership behavior.

3. Methodology

3.1. Design and sample

We make use of a large, existing dataset collected by the international consulting firm Korn Ferry (for more information on the dataset, see Euwema et al., 2007; Van Emmerik et al., 2010). The data collection was part of the assessment that took place before the start of the management training programs provided by this firm within each of the participating organizations, which guaranteed a response rate of approximately 100% (see Euwema et al., 2007). The data nowadays are collected fully online, whereas 20 years ago a combination of paper, fax and "teleform" (via score forms) was common.

Data on leadership behaviors were collected from both managers and their subordinates. We only use the subordinate ratings of leadership behavior, because it is well-known that the use of self-ratings of leadership is problematic (Harris and Schaubroeck, 1988; for an overview see Fleenor et al., 2010). We included only those countries with 500 managers or more. This led to a total sample of more than 150,000 managers from 38 countries (see Table 1), and 23 types of sectors. By far the most important sectors are manufacturing, professional services, pharmaceuticals, financials, and not-for profit/government. For each country, the leadership behaviors were translated into the language of the country, including variations, such as French–French but also Canadian French, US and US English, Brazilian Portuguese, et cetera.

TABLE 1 Sample composition.

Country	*N*	Percent
United States	36.080	13,5
United Kingdom	19.826	7,4
China	11.796	4,4
Brazil	9.536	3,6
Australia	7.467	2,8
India	6.612	2,5
Netherlands	5.862	2,2
Japan	4.867	1,8
Mexico	4.793	1,8
Germany	4.433	1,7
Malaysia	4.418	1,6
France	3.715	1,4
Poland	2.978	1,1
South Korea	2.973	1,1
Columbia	2.864	1,1
Spain	2.861	1,1
Italy	2.427	0,9
New Zealand	1.985	0,7
Belgium	1.883	0,7
Canada	1.630	0,6
Chile	1.608	0,6
Turkey	1.499	0,6
Ireland	1.421	0,5
South Africa	1.386	0,5
Singapore	1.258	0,5
Venezuela	1.231	0,5
Argentina	987	0,4
Peru	886	0,3
Somalia	876	0,3
Portugal	825	0,3
Russia	816	0,3
Slovakia	796	0,3
Sweden	772	0,3
Thailand	769	0,3
Czechia	731	0,3
Indonesia	632	0,2
Egypt	591	0,2
Philippines	536	0,2
	156.626	

3.2. Research instrument

3.2.1. Leadership behaviors

Each leader is rated by approximately five subordinates on a total of 46 questions across six behavioral leadership styles: authoritative, affiliative, coaching, participative, directive, and pacesetting leadership (see for more information about these scales, see Euwema et al., 2007; Wendt et al., 2009; Van Emmerik et al., 2010). Although these leadership styles were developed by the consulting firm itself (based on Litwin and Stringer, 1968;

Tagiuri and Litwin, 1968), they strongly resemble existing approaches, such as the directive, achievement-oriented, participative, and supportive leader behaviors as specified by path-goal theory (*cf.* House, 1971). All items used Likert-type scales, with answers ranging from 1 to 6, with alternative answers on the extreme poles. For each manager, the scores of on average five subordinates were aggregated. We examined the justification for aggregating subordinates' responses by calculating the ICC (1) value for each leadership style (James, 1982).

Authoritative leadership can be defined as a leadership style where the leader exercises control, and where the underlying intent is to promote employees' welfare. As a result, employees understand that the rules are there for their own benefit. Consequently, they respect the leader's decisions and comply with the rules (Pellegrini and Scandura, 2008). The scale consists of nine items and an example item is: "My manager often gives orders in the form of a suggestion, but makes it clear what he/she wants" (alpha = 0.84, ICC = 0.23).

Affiliative leadership is closely linked to the concept of "consideration" and can be defined as degree to which a leader shows concern and respect for followers, looks out for their welfare, and expresses appreciation and support (Bass, 2008). The scale consists of eight items and an example item is: "My manager often demonstrates concern for subordinates" (alpha = 0.87, ICC = 0.28).

Coaching leadership can be defined as behavior oriented towards the development of employees (Stoker et al., 2001; Bass, 2008). The scale consists of six items and an example item is: "My manager puts a great deal of effort into developing subordinates" (alpha = 0.85, ICC = 0.25).

Participative leadership can be defined as delegation of responsibilities, and shared influence in decision-making (e.g., Somech, 2005, 2006). The scale consists of seven items and an example item is: "Encourages subordinates to participate in most decision making" (alpha = 0.68, ICC = 0.23).

Directive leadership is aimed at giving clear and detailed directions to followers, structuring tasks and expecting compliance with instructions (see, e.g., House, 1971; Somech, 2006; Kamphuis et al., 2011; Lorinkova et al., 2013). The scale consists of nine items and an example item is: "Expects employees to follow his/her instructions precisely" (alpha = 0.81, ICC = 0.38).

Pacesetting leadership is behavior in which the leader shows that he/she expects excellence and self-direction (see, e.g., Goleman, 2000). The scale consists of seven items and an example item is: "As long as my manager sees results, he/she does not get involved in subordinates' work" (alpha = 0.68, ICC = 0.27).

Controls. The data also provide information on the individual leader level, as well as on the country level. For the individual leader, we control for age, gender, educational level, tenure, and nationality. At the country level, we control for national culture. We follow the 11 country-clusters as defined by Ronen and Shenkar (2013). We include these variables because previous research based on the same underlying data set has shown that these variables are related to leadership behavior (see Stoker et al., 2019; Garretsen et al., 2022).

4. Results

Our archetypal analysis consists of two steps. We first investigate whether it is possible to extract configurations of leadership behavior *via* archetypal analyses. Second, based on the results, and by way of illustration, we try to give meaning to the resulting archetypes.

4.1. Identifying archetypes

Even though archetypal analysis focuses on individual behaviors and not on averages, the actual application of the archetypal technique is rather similar to other clustering approaches. The phases of the application are (1) fitting the model to the data, (2) deciding on the number of archetypes to retain, and (3) look at items' configurations within the extracted archetypes. To determine the number of archetypes to retain, we fitted the model using 1–10 archetypes, and looked at the resulting Residual Sum of Squared Errors (RSS) in a screen plot. The optimal number of archetypes to retain was three, because the addition of extra archetypes did not significantly reduce the RSS (see Figure 1).

Based on the three archetypes in Figure 1, Figure 2 shows the barplots of the distributions of the leaders' ratings across the three archetypes for each of the 46 items. Each archetype is characterized by a set of questions that reflect the different behaviors measured by the survey. The height of the bars in Figure 2 signifies the association between the archetype and the behavior measured by the question. For each archetype, we only include items with relatively high scores, that is above the 80th percentile. It is evident that item scores above this threshold of the 80th percentile display strong associations with that particular archetype, as compared to the other two archetypes (Eugster and Leisch, 2009).

In order to be able to interpret the possible content of the archetypes, we show for each item to which archetype the item belongs. These results are presented in Table 2. The first observation based on Table 2 as well as Figure 2, is that the archetypes are not a straightforward combination of any of the six leadership styles. The same conclusion can be drawn from Figure 3, which also illustrates that each of the archetypes is a combination of different behaviors belonging to the six leadership styles, but crucially, that they not simply match the leadership styles.

The comparison between the three archetypes and the six leadership styles is warranted, because we want to be sure that the three archetypes found are not merely a way to classify the six leadership styles in higher order categories. After all, this would then imply that the archetypes are just again some leadership styles that do not capture leaders as a person or configuration of

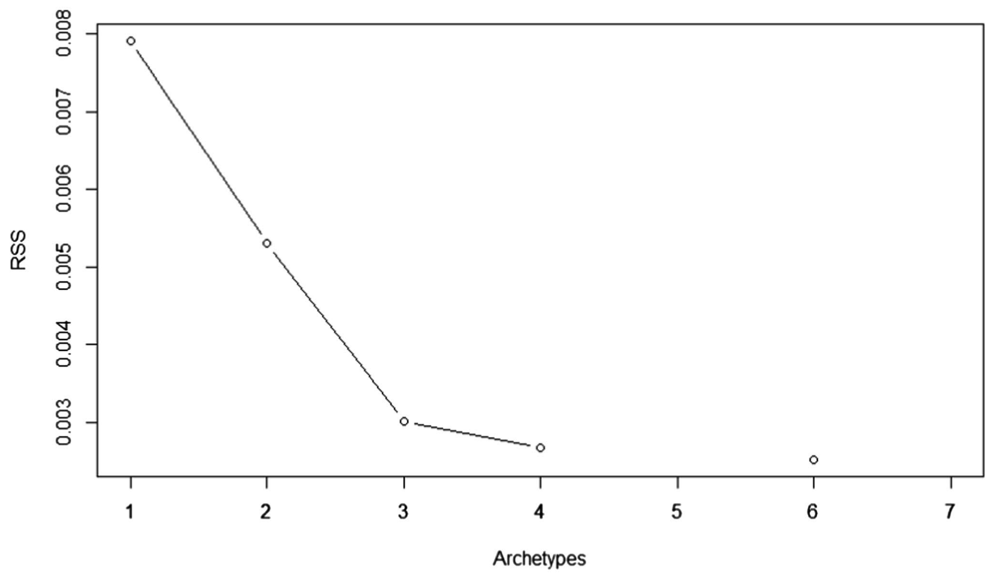

FIGURE 1
Screen plot of residual sum of squares.

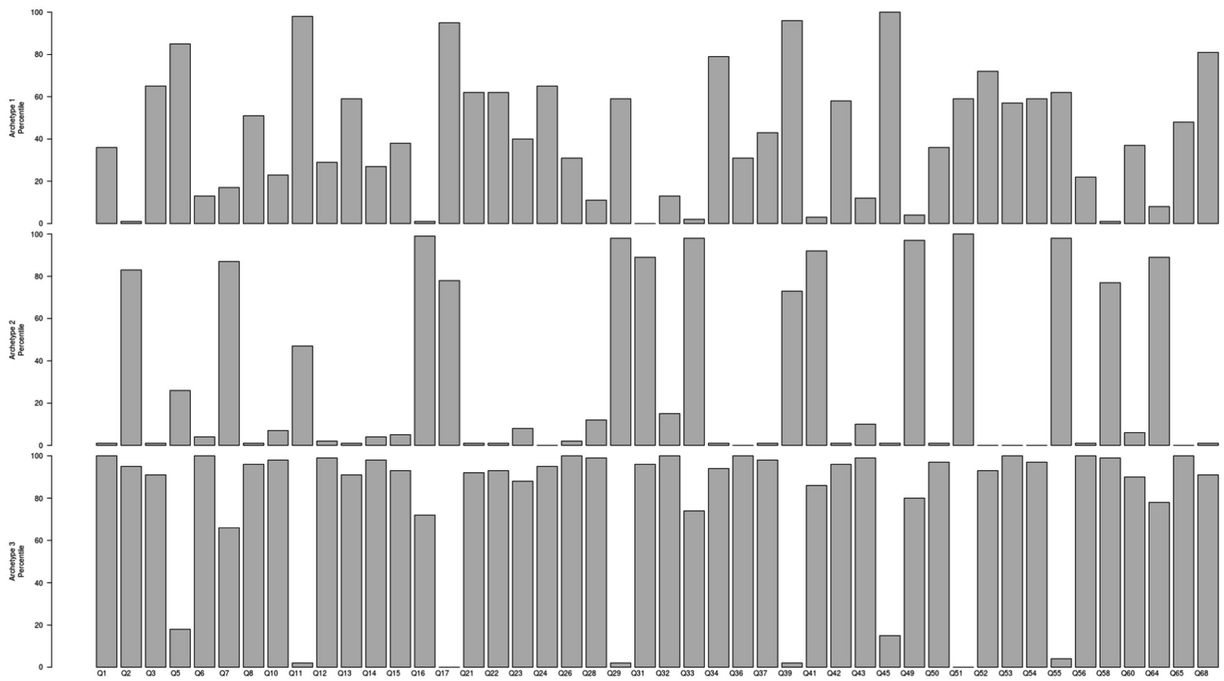

FIGURE 2
Behavioral score distributions for the three archetypes.

behaviors. To further investigate the differences between the six leadership styles and our three archetypes, we therefore assigned all individual leaders in the sample to one of the three archetypes based on the weights estimated in the previous section and as reported in Table 2 and Figure 2. Two different cut-off points were used. First, we assigned each leader to the archetype for which he or she received the largest weight – that is, the archetype he or she was associated with the most. Second, we classified each leader only if he or she was of a "pure" type, meaning that they received a weight of more than 0.5 for one of the archetypes. The second classification was more conservative and was used as a robustness test. Based on the first classification, we correlate the three

TABLE 2 46 Behavioral questions used to classify leaders, along with their archetype association.

Archetype 1
To instruct subordinates, my manager relies primarily on providing an example through his/her own behavior (Q5)
As long as my manager sees results, he/she does not get involved in subordinates´ work (Q11)
My manager does not ordinarily check on subordinates´ progress until their assigned tasks are due (Q17)
My manager expects subordinates to figure out for themselves how to do their jobs (Q39)
My manager gives capable subordinates the freedom to make decisions and mistakes without close supervision (Q45)
Archetype 2
My manager requires subordinates to submit detailed reports of their activities (Q2)
My manager makes sure that he/she does the important tasks himself/herself (Q7)
My manager makes most decisions for subordinates (Q16)
When a subordinate's work begins to fall short, my manager takes over the task himself/herself (Q29)
My manager supervises subordinates very closely (Q31)
My manager expects subordinates to follow his/her instructions precisely (Q33)
My manager believes that if he/she does not lay out goals and guidelines, subordinates will be passive and get nothing accomplished (Q41)
My manager expects subordinates to carry out his/her instructions immediately (Q49)
My manager is unwilling to spend time trying to improve poor performers (Q51)
After introducing new subordinates, my manager lets them make friends on their own (Q55)
My manager ´motivates´ subordinates by letting them know what will happen to them if their work is unsatisfactory (Q64)
Archetype 3
My manager works hard to ease tensions whenever they arise in my work group (Q1)
My manager requires subordinates to submit detailed reports of their activities (Q2)
My manager tries to reduce resistance to his/her decisions by telling subordinates what they have to gain (Q3)
My manager spends a lot of time reviewing subordinates´ progress to determine whether adjustments are necessary (Q6)
My manager works to develop close personal relationships with subordinates (Q8)
When subordinates fail at a task, my manager calmly but firmly lets them know why (Q10)
My manager spends time looking for opportunities for subordinates´ professional development (Q12)
My manager keeps everyone involved and well-informed about organizational issues that may affect them (Q13)
My manager discourages arguments that might lead to conflict among subordinates (Q14)
My manager often gives orders in the form of a suggestion, but makes it clear what he/she wants (Q15)
My manager discusses controversial changes in company policy at length with subordinates (Q21)
My manager encourages subordinates to talk to him/her about personal problems (Q22)
My manager praises subordinates for adequate work (Q23)
My manager believes subordinates´ feelings are as important as the task at hand (Q24)
My manager makes a special effort to explain to subordinates the purpose of their work (Q26)
My manager helps subordinates think through the who, when, and how of completing tasks (Q28)
My manager supervises subordinates very closely (Q31)
My manager holds frequent meetings to share information and ideas with subordinates (Q32)
When subordinates disagree with him/her, my manager explains why he/she wants something done a certain way (Q34)
My manager puts a great deal of effort into developing subordinates (Q36)
My manager relies on what he/she learns through personal contact with subordinates to use each person's talent most effectively (Q37)
My manager believes that if he/she does not lay out goals and guidelines, subordinates will be passive and get nothing accomplished (Q41)
My manager relies on his/her knowledge and competence to influence subordinates (Q42)
My manager questions subordinates to understand why their goals are important to them (Q43)
My manager devotes a great deal of time to subordinates´ job security and fringe benefits (Q50)
My manager takes time to explain the reasons for decisions in terms of the best interests of the organization and his/her subordinates (Q52)
My manager often demonstrates concern for subordinates (Q53)
When making decisions, my manager tries to get a great deal of input from subordinates (Q54)
My manager spends a significant amount of time helping subordinates to improve their performance (Q56)
My manager frequently monitors subordinates´ progress on their tasks (Q58)
My manager often rewards performance that is adequate (Q60)
My manager almost always tells subordinates when they have done good work (Q65)
My manager encourages subordinates to participate in most decision making (Q68)

Associations with archetype(s) are only provided for behaviors with scores above the 80th percentile.

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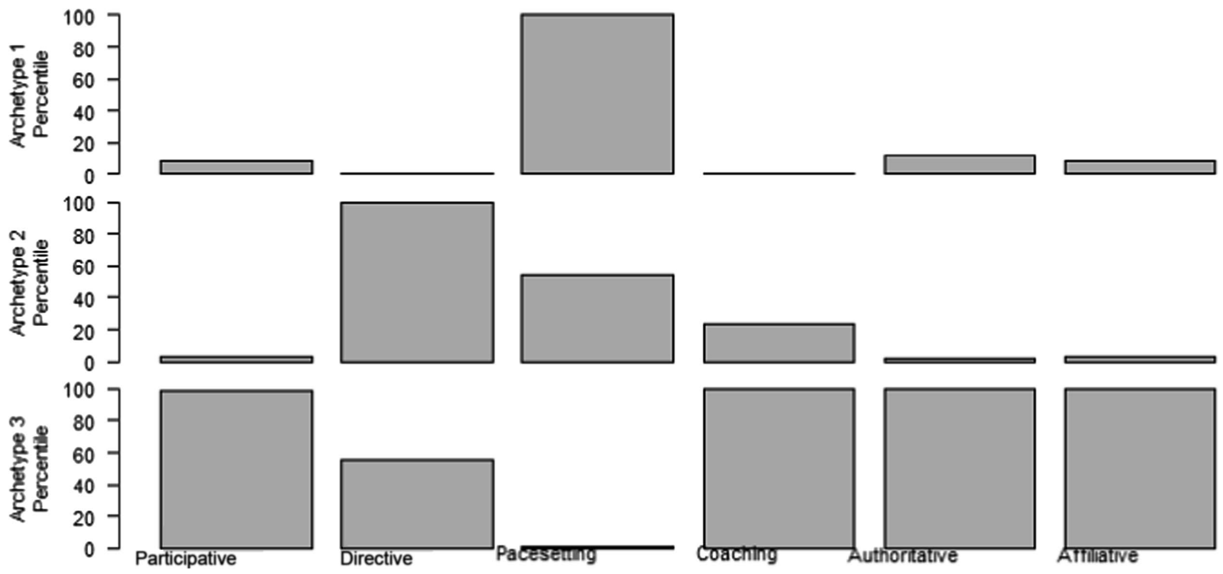

FIGURE 3
The relationship between the three archetypes and the six leadership styles.

archetypes with the six leadership styles as present in the underlying dataset, see Table 3 for the results.

Table 3 confirms that the six leadership styles are clearly but not exclusively associated with one of the three archetypes. Moreover, Table 3 demonstrates that the styles and archetypes are far from perfectly correlated.

As a more stringent test to investigate if the three archetypes overlap with (a combination of) the leadership styles, we applied regression analyses to compare the three archetypes with the six leadership styles. Note that the regressions are not meant to arrive at any causal relationships, but merely as a means to investigate whether and how the leadership styles and the archetypes are associated. For each archetype, we first regressed the archetype on the main or strongest correlated leadership style(s) of that archetype (see also Figure 3). The estimation results are shown in Table 4.

For Archetype 2, we explore the separate effect of the style with the strongest correlation in column 1, in this case directive leadership. For Archetype 3 we do the same in column 3 but now with authoritative, affiliative, coaching and participative leadership, and for Archetype 1 we explore the effect of pacesetting leadership in column 5. Secondly and crucially, we perform a full regression analysis for each of the archetypes (in columns 2, 4 and 6 for Archetypes 2, 3 and 1 respectively), where not only all leadership styles are included, but also all possible interaction effects between the six leadership styles. To do so, we include up to a maximum of a six-way interaction between the leadership styles.

The main take away from columns 1, 3, and 5 is that the leadership styles are all significantly associated with their respective archetype, that is to say the archetype that has the strongest correlation. But crucially, although these styles explain some of the variation in the archetypes, as can be derived from the R2, we can also conclude that the variance explained is far from perfect. The R2 value ranges from.26 for Archetype 2, to.27 for the Archetype 1, and.77 for Archetype 3.

In the consecutive columns 2, 4, and 6 of Table 4, each time we add not only the most relevant leadership style(s) as predictors, but also all possible interaction variables between the leadership styles, up to a maximum of a six-way interaction. With such an extensive set of interaction effects it becomes hard to interpret the sign of the coefficients (Jaccard and Turrisi, 2003), but interpretation is *not* the aim of these estimations. In line with the idea that each leader can be described as a configuration of leadership behaviors, the results of these regression models for the three archetypes show that almost all possible interactions are significant predictors of the archetypes.

Finally, we also checked whether the three archetypes follow from our dataset when we control for country culture. To do so, we re-did the archetypal analysis for each of the 11 country culture clusters as identified by Ronen and Shenkar (2013). With the possible exception of the Confucian cluster, all country culture clusters are indeed best characterized by the three archetypes that were found in the full sample (results not shown here because of brevity, but are available upon request).

4.2. One possible interpretation of the three archetypes

The results presented above allow us to give meaning to the content of these three archetypes. Archetype 1 contains five items and scores mainly high on the questions related to pacesetting leadership and on one item of participative leadership. Archetype

TABLE 3 Correlations between three archetypes, six leadership styles, and controls.

	Type 2	Type 3	Type 1	Gender	Native	Age	Tenure	Prim. School	Sec. Educ.	Some Univ.	Univ. Grad.	Adv. Degree	Direc-tive	Affil.	Author	Coach	Pace
Type 2																	
Type 3	−0.41																
Type 1	−0.483	−0.601															
Gender	−0.052	0.082	−0.034														
Native	−0.003	0.037	−0.033	0.024													
Age	−0.006	−0.135	0.135	−0.082	0.007												
Tenure	−0.027	−0.012	0.036	−0.068	0.066	0.457											
Primary School	−0.003	0.025	−0.022	0.022	0.021	0.035	0.057										
Secondary School	−0.002	0.039	−0.035	0.013	0.036	0.077	0.113	−0.029									
Some University	0.008	0.001	−0.008	0.005	0.002	−0.001	−0.007	−0.001	−0.003								
University Graduate	−0.006	0.017	−0.011	−0.009	0.038	−0.052	0.032	−0.087	−0.285	−0.009							
Higher Degree	0.008	−0.044	0.035	−0.002	−0.062	0.002	−0.107	−0.085	−0.278	−0.009	−0.824						
Directive	0.501	0.516	−0.933	0.022	0.041	−0.114	−0.027	0.015	0.026	0.009	0.014	−0.032					
Affiliative	−0.813	0.702	0.039	0.103	0.026	−0.062	0.015	0.016	0.028	−0.004	0.027	−0.046	−0.068				
Authoritative	−0.846	0.644	0.124	0.063	−0.002	−0.023	0.02	0.016	0.015	−0.005	−0.01	−0.001	−0.165	0.753			
Coaching	−0.578	0.865	−0.323	0.084	0.024	−0.121	−0.021	0.023	0.027	0	0.022	−0.042	0.221	0.705	0.68		
Pacesetting	0.375	−0.888	0.524	−0.077	−0.035	0.142	0.012	−0.028	−0.054	0.001	−0.02	0.057	−0.407	−0.61	−0.573	−0.729	
Participative	−0.782	0.534	0.172	0.026	0.023	0.001	0.032	−0.009	−0.008	−0.006	−0.01	0.016	−0.197	0.683	0.695	0.55	−0.452

$N = 154{,}285$. $p < 0.001$ for all coefficients.

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TABLE 4 Regression analyses for the three archetypes as a function of the six (interacted) leadership behaviors.

	Dependent variable					
	Type 2		Type 3		Type 1	
	(1)	(2)	(3)	(4)	(5)	(6)
Person.nSex	−0.022*** (0.001)	0.002*** (0.0002)	−0.0002 (0.001)	−0.001*** (0.0001)	0.005*** (0.001)	−0.001*** (0.0002)
Native	−0.009*** (0.001)	−0.002*** (0.0002)	0.008*** (0.001)	−0.001*** (0.0002)	−0.009*** (0.001)	0.003*** (0.0003)
Age	0.001*** (0.0001)	0.00001 (0.00001)	−0.001*** (0.00003)	0.00000 (0.00001)	0.001*** (0.0001)	−0.00002 (0.00002)
Tenure	−0.001*** (0.00005)	−0.00001 (0.00001)	0.0004*** (0.00003)	−0.00000 (0.00001)	0.0001** (0.0001)	0.00001 (0.00001)
Factor(ceducationid) 2	0.007* (0.004)	−0.001* (0.001)	−0.003 (0.002)	−0.001 (0.001)	0.012*** (0.004)	0.002 (0.001)
Factor(ceducationid) 3	0.065* (0.038)	−0.012* (0.007)	0.021 (0.023)	−0.005 (0.006)	−0.139*** (0.043)	0.018 (0.011)
Factor(ceducationid) 4	0.013*** (0.004)	−0.003*** (0.001)	−0.013*** (0.002)	0.0001 (0.001)	0.020*** (0.004)	0.003*** (0.001)
Factor(ceducationid) 5	0.018*** (0.004)	−0.002*** (0.001)	−0.012*** (0.002)	0.002** (0.001)	0.020*** (0.004)	0.0004 (0.001)
Directive	0.130*** (0.001)	1.578*** (0.125)		−1.716*** (0.104)		0.143 (0.204)
Affiliative		1.271*** (0.153)	0.046*** (0.001)	−2.237*** (0.127)		0.972*** (0.249)
Authoritative		0.888*** (0.144)	0.005*** (0.001)	−3.340*** (0.120)		2.458*** (0.235)
Coaching		1.526*** (0.175)	0.183*** (0.0005)	0.082 (0.145)		−1.614*** (0.286)
Pacesetting		1.191*** (0.111)		−1.542*** (0.092)	0.175*** (0.001)	0.354** (0.180)
Participative		0.330** (0.159)	0.002*** (0.001)	−2.324*** (0.132)		1.996*** (0.259)
Directive: Affiliative		−0.517*** (0.039)		0.604*** (0.032)		−0.089 (0.064)
Directive: Authoritative		−0.405*** (0.037)		0.895*** (0.031)		−0.492*** (0.061)
Affiliative: Authoritative		−0.375*** (0.036)		0.851*** (0.030)		−0.478*** (0.058)
Directive: Coaching		−0.575*** (0.043)		0.076** (0.036)		0.500*** (0.070)
Affiliative: Coaching		−0.396*** (0.043)		0.402*** (0.035)		−0.006 (0.069)
Authoritative: Coaching		−0.323*** (0.042)		0.570*** (0.035)		−0.247*** (0.068)
Directive: Pacesetting		−0.449*** (0.028)		0.485*** (0.024)		−0.037 (0.046)

(Continued)

TABLE 4 (Continued)

	Dependent variable					
	Type 2		Type 3		Type 1	
	(1)	(2)	(3)	(4)	(5)	(6)
Affiliative: Pacesetting		−0.412*** (0.035)		0.598*** (0.029)		−0.187*** (0.058)
Authoritative: Pacesetting		−0.362*** (0.033)		0.879*** (0.028)		−0.518*** (0.054)
Coaching: Pacesetting		−0.499*** (0.042)		0.111*** (0.035)		0.389*** (0.069)
Directive: Participative		−0.366*** (0.041)		0.621*** (0.034)		−0.256*** (0.068)
Affiliative: Participative		−0.276*** (0.041)		0.608*** (0.034)		−0.334*** (0.067)
Authoritative: Participative		−0.184*** (0.040)		0.914*** (0.033)		−0.732*** (0.064)
Coaching: Participative		−0.126*** (0.048)		0.264*** (0.040)		−0.136* (0.079)
Pacesetting: Participative		−0.272*** (0.034)		0.638*** (0.029)		−0.367*** (0.056)
Directive: Affiliative: Authoritative		0.135*** (0.009)		−0.215*** (0.008)		0.081*** (0.015)
Directive: Affiliative: Coaching		0.148*** (0.011)		−0.115*** (0.009)		−0.033* (0.017)
Directive: Authoritative: Coaching		0.125*** (0.011)		−0.158*** (0.009)		0.033* (0.017)
Affiliative: Authoritative: Coaching		0.091*** (0.009)		−0.184*** (0.007)		0.093*** (0.014)
Directive: Affiliative: Pacesetting		0.141*** (0.009)		−0.170*** (0.008)		0.030* (0.015)
Directive: Authoritative: Pacesetting		0.121*** (0.009)		−0.243*** (0.007)		0.122*** (0.015)
Affiliative: Authoritative: Pacesetting		0.113*** (0.008)		−0.229*** (0.007)		0.116*** (0.014)
Directive: Coaching: Pacesetting		0.172*** (0.011)		−0.063*** (0.009)		−0.109*** (0.017)
Affiliative: Coaching: Pacesetting		0.131*** (0.011)		−0.143*** (0.009)		0.012 (0.017)
Authoritative: Coaching: Pacesetting		0.123*** (0.010)		−0.181*** (0.009)		0.058*** (0.017)
Directive: Affiliative: Participative		0.136*** (0.011)		−0.151*** (0.009)		0.015 (0.018)
Directive: Authoritative: Participative		0.107*** (0.010)		−0.227*** (0.009)		0.121*** (0.017)
Affiliative: Authoritative: Participative		0.082*** (0.009)		−0.205*** (0.007)		0.124*** (0.014)
Directive: Coaching: Participative		0.105*** (0.012)		−0.077*** (0.010)		−0.028 (0.020)

(Continued)

TABLE 4 (Continued)

	Dependent variable					
	Type 2		Type 3		Type 1	
	(1)	(2)	(3)	(4)	(5)	(6)
Affiliative: Coaching: Participative		0.050*** (0.011)		−0.118*** (0.009)		0.068*** (0.017)
Authoritative: Coaching: Participative		0.034*** (0.011)		−0.172*** (0.009)		0.137*** (0.017)
Directive: Pacesetting: Participative		0.127*** (0.009)		−0.177*** (0.008)		0.050*** (0.015)
Affiliative: Pacesetting: Participative		0.103*** (0.010)		−0.170*** (0.008)		0.068*** (0.015)
Authoritative: Pacesetting: Participative		0.091*** (0.009)		−0.249*** (0.008)		0.158*** (0.015)
Coaching: Pacesetting: Participative		0.097*** (0.012)		−0.115*** (0.010)		0.017 (0.019)
Directive: Affiliative: Authoritative: Coaching		−0.034*** (0.002)		0.048*** (0.002)		−0.014*** (0.004)
Directive: Affiliative: Authoritative: Pacesetting		−0.035*** (0.002)		0.060*** (0.002)		−0.026*** (0.004)
Directive: Affiliative: Coaching: Pacesetting		−0.045*** (0.003)		0.044*** (0.002)		0.001 (0.005)
Directive: Authoritative: Coaching: Pacesetting		−0.040*** (0.003)		0.053*** (0.002)		−0.012*** (0.004)
Affiliative: Authoritative: Coaching: Pacesetting		−0.034*** (0.002)		0.057*** (0.002)		−0.024*** (0.004)
Directive: Affiliative: Authoritative: Participative		−0.035*** (0.002)		0.049*** (0.002)		−0.014*** (0.004)
Directive: Affiliative: Coaching: Participative		−0.031*** (0.003)		0.031*** (0.002)		−0.001 (0.004)
Directive: Authoritative: Coaching: Participative		−0.025*** (0.003)		0.044*** (0.002)		−0.019*** (0.004)
Affiliative: Authoritative: Coaching: Participative		−0.013*** (0.002)		0.046*** (0.002)		−0.033*** (0.003)
Directive: Affiliative: Pacesetting: Participative		−0.039*** (0.003)		0.045*** (0.002)		−0.005 (0.004)
Directive: Authoritative: Pacesetting: Participative		−0.035*** (0.003)		0.064*** (0.002)		−0.029*** (0.004)
Affiliative: Authoritative: Pacesetting: Participative		−0.029*** (0.002)		0.057*** (0.002)		−0.029*** (0.003)
Directive: Coaching: Pacesetting: Participative		−0.042*** (0.003)		0.035*** (0.003)		0.007 (0.005)
Affiliative: Coaching: Pacesetting: Participative		−0.029*** (0.003)		0.043*** (0.002)		−0.014*** (0.004)
Authoritative: Coaching: Pacesetting: Participative		−0.028*** (0.003)		0.056*** (0.002)		−0.028*** (0.004)

(Continued)

TABLE 4 (Continued)

	Dependent variable					
	Type 2		Type 3		Type 1	
	(1)	(2)	(3)	(4)	(5)	(6)
Directive: Affiliative: Authoritative: Coaching: Pacesetting		0.011*** (0.001)		−0.016*** (0.0005)		0.005*** (0.001)
Directive: Affiliative: Authoritative: Coaching: Participative		0.007*** (0.001)		−0.011*** (0.0005)		0.004*** (0.001)
Directive: Affiliative: Authoritative: Pacesetting: Participative		0.010*** (0.001)		−0.014*** (0.0005)		0.005*** (0.001)
Directive: Affiliative: Coaching: Pacesetting: Participative		0.012*** (0.001)		−0.012*** (0.001)		0.001 (0.001)
Directive: Authoritative: Coaching: Pacesetting: Participative		0.011*** (0.001)		−0.015*** (0.001)		0.004*** (0.001)
Affiliative: Authoritative: Coaching: Pacesetting: Participative		0.008*** (0.001)		−0.015*** (0.0004)		0.007*** (0.001)
Directive: Affiliative: Authoritative: Coaching: Pacesetting: Participative		−0.003*** (0.0001)		0.004*** (0.0001)		−0.001*** (0.0002)
Constant	−0.235*** (0.005)	−2.231*** (0.504)	−0.529*** (0.003)	5.635*** (0.419)	−0.231*** (0.005)	−2.414*** (0.822)
Observations	154,285	154,285	154,285	154,285	154,285	154,285
Adjusted R^2	0.259	0.975	0.767	0.985	0.279	0.948
F Statistic	6,005.615*** (df = 9; 154,275)	83,143.110*** (df = 71; 154,213)	42,219.360*** (df = 12; 154,272)	145,070.100*** (df = 71; 154,213)	6,645.062*** (df = 9; 154,275)	39,487.490*** (df = 71; 154,213)

*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

2 scores on items mainly related to directive leadership, but also to two items of pacesetting leadership. Finally, archetype 3 scores high and exclusively on affiliative, authoritative and coaching leadership. Moreover, it also scores high on items belonging to directive and to participative leadership. Clearly, these three archetypes are a configuration of leadership behaviors that are associated with various leadership styles.

The follow-up question is therefore, whether these kinds of archetypes can be given a meaningful interpretation. Following Fischer and Sitkin (2022), we build on the configurational tradition in adjacent fields. Examples from these fields indicate that, in order to arrive at meaningful configurations, it is important to search for relevant conceptual dimensions. For instance, Mintzberg (1980) five organizational structures were based on two key dimensions, namely coordinating mechanisms and design parameters (Fischer and Sitkin, 2022). Likewise, Cardinal et al. (2010) also used two dimensions to arrive at four organizational control types. To be clear, the aim of our paper is to investigate whether we can arrive at meaningful configurations of leadership behaviors. By selecting two constituent dimensions that allow us to determine a meaningful content for each of the three archetypes, we want to show that it is possible to do so, thereby using relevant insights form adjacent fields.

If we look at the content of the items that are linked to the three archetypes, in our view these three archetypes differ primarily along two dimensions: (a) the amount of time that managers spend with their employees, and (b) how managers communicate with subordinates (see below). Managers that are characterized as Archetype 1 do neither transmit nor receive information, nor do they intervene unless the need to do so arises. The main dimension here is the amount of time spent by managers with their subordinates, which is for this archetype rather minimal. The way of communication between managers and subordinates is less clear. Archetype 2 leaders primarily transmit information to subordinates by clearly telling them what is expected, preferably through rigid instructions, and by supervising them closely. Archetype 3 leaders on the one hand transmit information to subordinates through instructions, monitoring, and day-to-day management, which is represented by the overlap of questions 2, 31, and 41 with Archetype 2. But on the other hand, they also receive information, as opposed to Archetype 2 leaders, by spending time listening to subordinates' comments, suggestions and disagreements, and trying to respond to these. Based on the above categorization of the three archetypes, one could label managers of Archetypes 1, 2, and 3 as "minimal," "one-way," and "two-way" leaders, respectively.

The classification of archetypes *via* the two dimensions as suggested above can be underpinned by research on communication styles and time allocation by managers. The two dimensions are at home in research in various sub-fields, notably communication studies, psychology, management as well as economics. De Vries et al. (2009, 2010) show for instance how various communication styles matter. The latter study shows specifically for leaders how their communication styles matter for leader effectiveness in terms of subordinates' work engagement or job satisfaction.

When it comes to the time allocation of managers, and while using insights from social psychology, Penfield (1974) already wrote a seminal study on the time allocation of managers and a classification of what it is that managers actually do. The time allocation combined with the actual content of managerial activities is also the subject of recent research by Bandiera et al. (2020), who studied the behavior of 1,114 CEOs in six countries using CEO diary data. This study concludes that CEOs can indeed be split along the two dimensions communication style and content.

This notion about the relevance of (measuring) actual managerial communication and time allocation goes back to the seminal research by Mintzberg (1973) and it can be used to argue that the two dimensions alluded to above, communication style as well as time spent with subordinates, make sense (see for instance Luthans et al., 1985). What we take away from this literature is that the two dimensions identified can not only be used to demarcate but could also be used as conceptual building blocks for the three archetypes found.

5. Conclusion and discussion

Answering calls from leadership scholars to critically assess the use of leadership styles (Yukl, 1999; Dansereau et al., 2013; Van Knippenberg and Sitkin, 2013; Antonakis and House, 2014; Banks et al., 2016; Fischer and Sitkin, 2022), the aim of our paper is to investigate whether one can arrive, through archetypal analysis, at meaningful configurations of leadership behaviors. By employing the technique of archetypal analysis, we find ourselves in the company of other management scholars (e.g., Venaik and Midgley, 2015) who have already shown how archetypal analysis can be used in related fields of management. Our paper is, however, the first to apply archetypal analysis to leadership research, and the first to establish configurations of leadership for a large dataset (Fischer and Sitkin, 2022).

The results of our archetypal analysis among more than 150,000 leaders show two main findings. First, building on a set of 46 behavioral items measuring six leadership styles in total, the data show clear evidence for the existence of three archetypes of leadership behavior. Although the archetypes found do, to some extent, resemble one or more of the six leadership styles, they do not coincide with them, which shows that a configurational approach to leadership via archetypal analysis leads to a different classification of leaders than the standard variable oriented approach of leadership styles.

Second, the three resulting archetypes can be classified along two dimensions in our view, namely (a) the amount of time managers spend on interacting with their subordinates and (b) the communication style of the managers. Based on these two dimensions, we distinguish three types of leaders as "minimal," "one-way" and "two-way" leaders. Managers that are characterized as "minimal" do neither transmit nor receive information, nor do they intervene unless the need to do so arises. The "one-way" leader primarily transmits information to subordinates by clearly telling them what is expected from subordinates, preferably through rigid instructions, and by supervising them closely. The "two-way" leader transmits information to subordinates through instructions, monitoring, and day-to-day management, and also receives information by spending time listening to subordinates' comments, suggestions and disagreements, and trying to respond to these.

The first contribution of our paper is that it offers support for a configurational or person-oriented approach to leadership *via* the application of archetypal analysis. In doing so, we take as our starting point that leaders are not *a priori* reduced to showing only a limited number of leadership styles. Our results confirm that archetypal analysis indeed is a promising tool to arrive at meaningful configurations of leadership behaviors. More generally, our paper is an example of how a configurational approach can "overcome the current impasse in leadership research" (Fischer and Sitkin, 2022, p. 65), because it offers an alternative method to group together individual leadership behaviors, thereby circumventing the sketched problems with existing leadership styles that we described in the introduction.

As a follow-up, our second contribution is that we show that the archetypes found really differentiate from the well-established leadership styles in our dataset. To address this issue, we do not only confront the three archetypes with the underlying leadership styles but also with all possible interactions between these styles. These results provide further support for the person-oriented approach as a promising alternative to the variable-centered approach, which is still more common in leadership research. In addition, such a person-oriented and hence more holistic approach seems more fitting in a context where change and complexity are pressing and prominent.

The final contribution concerns the meaningfulness of our archetypes. We show that archetypal analysis, at least for our data set, results in three conceptually meaningful archetypes of leaders, when we classify them based on two conceptual dimensions (Fischer and Sitkin, 2022). These two dimensions, namely time-spending and communication style, have support in management research more broadly, going back to scholars like Mintzberg (1973) and Penfield (1974), but also following more recent work by De Vries et al. (2009, 2010) and Bandiera et al. (2020). Crucially, these two characteristics have previously not been identified as distinctive meta-features in relation to leadership behaviors. When it comes to future research, a key question would be whether these two features are also to be found in other data sets where different leadership behaviors are measured.

Our study has two main limitations. An important limitation is that we could not confront our archetypes with objective outcome measures. This is due to data limitations, but certainly a next (and necessary) step to further analyze the relevance of archetypes for leadership research. In our dataset, we do have access to subjective team outcome variables, such as team cohesiveness (Dion, 2000). Although these variables, being single source data, have various concerns in terms of endogeneity (Antonakis, 2017), we explored the relationship between our three archetypes and this outcome variable (results not shown here, but available upon request). We find that the three archetypes significantly explain variation in this outcome variable over and above the individual leadership styles. In particular, compared to the other two archetypes, the “two-way” archetype is significantly and positively related to team cohesiveness. This result suggests that especially leaders who spend relatively more time to their employees, and communicate relatively more in an interactive manner, are associated with teams that are more cohesive and thereby more effective.

A second limitation is the possible meaning of the three found archetypes beyond our data set and analysis. We would like to stress that the archetype classifications as well as the two suggested dimensions as described here, are unique to this particular dataset and behavioral configuration, and thus should not be interpreted as a set of classifications that is definitive across all contexts. Similarly, but beyond the scope of the present paper, one could ask whether other clustering techniques like latent profile analysis or mixture models would yield similar classifications of leaders.

The generalizability of configurational findings like the ones shown in the present paper is a crucial issue for future research (Woo et al., 2018; Fischer and Sitkin, 2022). Therefore, we hope that our study on archetypes will serve as a motivation for other scholars to investigate other datasets, possibly in different contexts. The purpose is not only to test whether they would find comparable archetypes, but more importantly to further improve the validity of a configurational approach to leadership, and in doing so, also to compare those findings to other person or pattern oriented clustering techniques (e.g., Foti et al., 2012).

Data availability statement

The data analyzed in this study is subject to the following licenses/restrictions: The authors do not have permission to share data. Requests with respect to the use of the dataset can be made to the corresponding author, who will inform the owner of the dataset, Korn Ferry, about this request.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

Author contributions

JS, HG, DS, and TV contributed to conception and design of the study and wrote sections of the manuscript. DS organized the database. DS and TV performed the statistical analysis. JS and HG wrote the first draft of the manuscript. All authors contributed to manuscript revision, read, and approved the submitted version.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Evaluating emotional labor from a career management perspective

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Emotional labor claims its significance as the key indicator both of the psychological health of contemporary employees, and the productivity of service-based businesses depending upon genuine emotional input of employees. By far, research on emotional labor of employees in an organizational context is still lacking. This study aims to explore the relationships among emotional labor, organizational support, career competences and career commitment to investigate how emotional labor interacts with the organizational context and affects the career management of the employee. Data were collected from a sample of 387 frontline employees working at two luxury hotel brands in China. Structural equation modeling (SEM) was utilized to estimate the relationships among the constructs. It is demonstrated by the findings that organizational support mediates positively on emotional labor, which exerts positive influences on career competences and career commitment. Sound handling of emotional labor, boosted by a supportive organizational environment, has been ascertained to positively predict long-term career paths of the employees at the company. This study provides insights into how the tourism and hospitality industry can optimize the functions of emotional labor for in enhancing service quality and customer satisfaction, as well as promoting the psychological well-being of the employees.

KEYWORDS

emotional labor, organizational support, career competences, career commitment, China

Introduction

The salience of emotional labor has been long established in the tourism and hospitality industry (Pugh, 2001; Wong and Wang, 2009). For instance, Disneyland always brands its employees as performers and actors/actresses, while in the hotel sector the title of 'smile ambassadors' is the norm rather than exception. Given the inherent service features of the tourism and hospitality industry such as the intangibility of the products, the emphasis on the experiential values that the customer can achieve, and the high incidence and complexity of customer-employee interactions, emotional labor is a key requirement for tourism and hospitality jobs at all levels (Lucas and Deery, 2004). It has been suggested by Yan et al. (2012) that in the tourism and hospitality arena, emotional labor should assume no less significance than the work input by the employees in physical and intellectual aspects. Taking cognizance of the growing penetration of 'theaterization' into the tourism and hospitality industry, emotional labor is expected by Kim (2008) to take the central stage in real terms.

From a managerial perspective, therefore, emotional labor should be addressed and cultivated to such an extent that it cannot only enhance the job performance of the employees, but also contribute to their psychological well-being. Besides, emotional labor should be regarded as an essential aspect for the realization of the corporate objectives of the business (Morris and Feldman, 1997). For many service-based enterprises, emotional labor can become the factor distinguishing their core competitiveness (Kim, 1998). Moreover, with the growing popularity of the internal customer paradigm, positive emotional labor is posited by Zapf and Holz (2006) to be the prerequisite for sound organizational behaviors, which directly leads to the successful operation and management of the tourism & hospitality enterprises. Meanwhile, emotional labor of employees has been established as closely related to their job satisfaction with the workplace and long-term commitment to it, with employees who are burnt out in their emotional labor more likely to display emotional dissonance and detachment, leading to job exits and career aversions (Tosten and Mustafa Toprak, 2017; Asumah et al., 2019). In this sense, emotional labor guarantees investigation from the perspective of career management for the sustainable operation of the business (McGinley et al., 2019).

While it has been widely recognized that emotional labor can be closely supervised and controlled by employers (Pizam, 2004; Bolton, 2005; Chu and Murrmann, 2006), by far most research efforts on it have been mostly concentrated on the employee side such as their job autonomy, job satisfaction, emotional dissonance & exhaustion, psychological well-being etc. (Kim and Han, 2009; Chu et al., 2011; Gursoy et al., 2011). This study intends to tackle the current research paucity of addressing emotional issues of employees from the angle of career path, through investigating the relationships between emotional labor and the significant managerial factors of perceived organizational support, career competence and career commitment in tourism and hospitality context. The specific research objectives of this study are three-fold: first, to explore and propose the conceptualization of emotional labor, perceived organizational support, career competence and career commitment for hospitality employees; second, to assess the interrelationships among the proposed concepts; third, to generate theoretical as well as practical insights that can serve as references for agile leadership in caring for emotional ramifications of employees in contemporary organizations.

Literature review

Emotional labor

Grandey (2000) semantically conceptualized emotional labor as the process of emotion regulation and expression by employees for the realization of organizational objectives. According to this definition, emotional labor is the management of emotions by the employees in the workplace, displaying and adjusting feelings and expressions that are needed to fulfill the requirements of the job (Brotheridge and Lee, 2003). In addition to this value-laden feature, emotional labor is also characterized by the responsiveness from the customers, the normative requirements from the employer as well as its omnipresence among employees at different levels (Lucas and Deery, 2004).

As is suggested by Liu et al. (2004), emotional labor is a concept that is of close relevance but yet not limited to the service sector, with the tourism and hospitality industry no exception here. Actually, one of the earliest examination on emotional labor was under the context of the airline sector, indicating the salience of this issue in the tourism and hospitality industry (Hochschild, 1983). It can be said that the job performance of a tourism and hospitality employee is entirely emotion-oriented (Pizam, 2004). On one hand, the facial expressions and body languages are already integrated into the quality of service provided by the employee to the customer, which can be best illustrated by the recognition of the factors of empathy and assurance as the key dimensions of service quality. On the other hand, emotional labor is dynamic rather than static in the service process, open to instant adjustment and optimization in accordance with the feedback from the customer, so that the service product can be successfully consumed. Since customer satisfaction, attitude and loyalty are all best expressed in emotional forms, the resonance functions of the emotional labor of the employee are more and more cherished and anticipated (Yan et al., 2012). Thus, great stakes are placed on the presentation and management of emotional labor for the enterprise, whether in soliciting new customers or the retention of established ones (Brotheridge and Lee, 2003). Hochschild (1983) provided a classical categorization of emotional labor into three streams of surface acting, deep acting and genuine acting. In surface acting, employees fake their motions through observable features in gestures, expressions and voice tones to align with the requirements of their job; deep acting is concerned with more active involvement of the inner states of the employee in addition to surface acting, through the utilization of mental and psychological maneuvers such as thoughts, memories and images. In other words, the employee would 'labor out' the expected emotions in deep acting. The third category of genuine emotion is where the felt emotions are congruent with the expressed ones, as the employee express what he or she experiences in a spontaneous and natural manner. Genuine acting is consistent with the term of 'naturally felt emotions' offered by Diefendorff et al. (2005). The existence and effects of different forms of emotional labor indicate the dilemma and even conflicts of 'feeling rules' and 'display rules' in the work environment of many industries, which may easily lead to emotional dissonance and exhaustion and thereby severe mental and psychological challenges to the employee. For instance, in the service industry, job burnout is usually preceded by emotional exhaustion, which is much more noted at middle and senior managerial levels (Bolton, 2005). Conversely, positive effects of emotional labor can arise from the synergy of felt and display emotions such as job satisfaction, self-efficacy and self-esteem (Chu and Murrmann, 2006).

With regard to factors influencing the generation and outcomes of emotional labor, two sources have been identified, namely, personal and organizational (Lucas and Deery, 2004; Yang and Chang, 2008). From a personal perspective, emotional labor has been discovered to be related to the work experiences, personality as well cultural values of the employee. On this account, it has been postulated by Xu (2007) that some employees may be inherently unfit for the emotion labor required by certain professions. This, nevertheless, does not rule out the emotional efforts that can be wielded by the employee to achieve certain expected emotional outcomes without rendering negative emotional consequences. In addition, with the growing level of diversity in the workforce of the tourism and hospitality industry, the cultural underlying of emotional labor are more and more evident (Yan et al., 2012). From the organizational perspective, the consensus has been reached that emotional labor can be effectively regulated and managed so that the positive effects of emotional labor can be induced. Particularly, effective emotional management can introduce energetic and amusing dynamics into the otherwise monotonous tasks and compensate for the 'dull aspects' of the job. Meanwhile, emotional labor can be appropriately addressed through the facilitation of job autonomy, which has been empirically examined by Kim et al. (2007) to make positive contributions to the prevention of emotional dissonance and exhaustion.

Perceived organizational support

Perceived organizational support can be defined as the perceptions by the employee of the evaluation of work and extent of support from the organization (Allen, 1995). Perceived organizational support reflects the interactions between the organization and employee, with the aim of realization of an interrelationship that is based on reciprocity.

Perceived organizational support is derived from social exchange elaborations, and can be embodied in material, psychological as well as emotional terms. In the professional arena, perception by the employee of perceived organizational support should encompass not only expectations for remunerations that match job performance, but also demand for in-time care and necessary help from the employer. Hutchison (1997) stressed that particularly in scenarios of emergencies or tremendous challenge, the values of perceived organizational support in psychological and emotional forms would overweigh those in monetary forms. In this sense, the psychological contracts between the employee and the employer would be consolidated to such an extent that greater trust, loyalty and sense of belonging would be secured for the organization. Generally speaking, perceived organizational support is recorded to be more salient when such support is perceived as spontaneous, interactive and responsive (Settoon et al., 1996).

Eisenberger et al. (1997) identified three major dimensions of perceived organizational support, namely organizational rewards & job condition, supervisory support and fairness. Organizational rewards & job conditions consist of tangible material rewards as well as those intangible benefits like working experiences beneficial for future career development, autonomy in job, sense of security etc. Such organizational endowments are direct indications of organizational commitments to the employee, and help enhance the in-role and out-role behaviors of the employee toward the achievements of corporate objectives (Hutchison, 1997). Supervisory support is usually presented in the forms of attention to the employee, recognition of the employee's contribution and communications of corporate values. It was demonstrated by Yoon and Lim (1999) that supervisory support is perceived most strongly from the immediate superiors of the employees, which is an apt reflection of the peculiarities of the hotel sector which are characterized by close and dynamic supervisor-employee interactions. The third dimension of procedural justice, which underpins the equity principle in social exchange elaborations, is related to the perception by the employee support as against those of other employees. From rewards & penalties policies to allocation of organizational resources, procedural justice is actively pursued and appreciated by the employee, and is a key determinant of the balance and harmony of interrelationships among the employees.

Vigorous organizational support has been found out to incease job satisfaction of employees (Hutchison, 1997), a favorable outcome that is strongly associated with sound handling of emotional labor (Asumah et al., 2019; McGinley et al., 2019). In view of the above review of emotional labor and perceived organizational support, the first research hypothesis is proposed as follows:

> *H1*: There is a positive relationship between organizational support and emotional labor.

Career competencies

Eby et al. (2003) defined career competencies as the portfolio of work experiences, skills and qualifications that the employee progressively accumulated during the career. As against those attributes relevant to the required job performance of an employee, career competencies address the employee capacities on at a longitudinal, strategic and sustainable level (Arthur et al., 1995). In this regard, career competencies introduce intelligence aspects into the career management of the employee, and aim for the integration of individual and corporate successes (Eby et al., 2003). Especially, career competencies are significant determinants of positive career changes along the career path of the employee. In addition, with growing emphasis placed on systematic and comprehensive career management, career competencies are purported as significant criteria for career progress to managerial and leadership positions (Sturges et al., 2003).

Three branches of career competencies were articulated by Arthur et al. (1995), which are 'Knowing why', 'knowing who' and 'knowing how'. Knowing why concerns the motivational aspirations of the employee in self-identification, self-understanding and possibilities exploration. Knowing why also relates to the ability of adaptation to shifting work contexts. Knowing why can be further accounted for by the three variables of career insight, proactive personality, and openness to experience. Knowing who is synonymous with the networks and contacts from within or beyond the organization, the values of which can be exchanged for the employee's career progress. Knowing who within the organization encompasses normative relationships as well as those with mentoring natures. Knowing who outside the organization, on the other hand, can extend to contacts such as suppliers, consultants and professional acquaintances. The more conventional concepts of career-relevant knowledge and skills fall into the category of knowing how, which is featured by accumulation and foundation (Sturges et al., 2003). Knowing how consists of two inter-related sub-categories of career-related skills and career identity, with the latter serving as the motivator and director of skills accumulation (Eby et al., 2003).

Career competencies in the tourism and hospitality industry have been opined by Tesone and Ricci (2006) to be one of the most comprehensive and demanding in the service sector, given the diversity of customer needs, combination of physical and psychological inputs and potential of cross-cultural conflicts. The requirements of flexibility and personalization that characterize this industry pose further challenges to the cultivation of career competencies in this industry (Christou, 2002). Major competencies that have been identified are positive attitude, communication skills, effective listening as well as willingness to work hard (Chung, 2000; Brownell, 2008), thereby leading to the formulation of the second research hypothesis of this study as follows:

> *H2*: There is a positive relationship between emotional labor and career competences.

Career commitment

Career commitment is purported by Blau (1999) to be an attitudinal measurement of one's motivation to work in a chosen vocation. In this regard, career commitment can be analogized as a psychological contract between an individual and his/her career, indicating the level of attachment and involvement to the career by the individual, the degree of alignment of individual objectives with organizational ones, as well as the extent to which the career takes the central stage of the individual's daily life. Meanwhile, another paradigm emphasizes the behavioral aspects of career commitment, focusing on the temporal and monetary costs and benefits that are incurred to the individual arising from the commitment behavior. An employee would conduct a subjective person-organization fit evaluation, and the differences between the exact career peculiarities and the expectations of the employee would determine the outcomes of career commitment (Carson and Bedeian, 1994). Career commitment has merits in reliably predicting such important factors as work pressure, job efficacy and satisfaction. Career commitment was firstly applied in the education sector and has been widely adopted by tertiary sectors to examine and tackle employee absenteeism and quitting (Cohen, 1999).

Career commitment is a dynamic concept that is based upon the constant and active interactions between the employee and the career milieu, and may have taken form even before one enters a certain career (Chang, 1999). Cohen (1999) listed out three major factors underlying the emergence of career commitment, namely the predilection for the career, balance of the costs of shifting career and concern over violation of social norms in career change. Respectively, career commitment can be divided into emotional, cost and normative categories. It can be learned from this classification that career commitment can be affected by both intrinsic and extrinsic attributes of the employee, such as demographic features, personality, salary, work environment and work challenges, etc. In the tourism and hospitality contexts, career commitment has been found to be positively related to educational backgrounds, titles, foreign language skills and professional certifications, thereby illustrating the vast spaces that can be explored to enhance the career commitment of tourism and hospitality employees (Leslie and Russell, 2006; Walsh and Taylor, 2007). Therefore, the third to fifth research hypotheses are generated, which are coalesced with the first two hypotheses and presented in the research framework of this study as displayed in Figure 1:

> *H3*: There is a positive relationship between emotional labor and career commitment.
>
> *H4*: There is a positive relationship between organizational support and career competences.
>
> *H5*: There is a positive relationship between organizational support and career competences.

Method

Scale development

In accordance with relevant literature, emotional labor was measured on a three-dimension scale which included the attributes of surface acting, deep acting and genuine acting. The measurement proposed by Diefendorff et al. (2005) was the primary reference, with attention also paid to the scale developed by Kim and Han (2009) which was of more hospitality features. Altogether, seven, five and two items were proposed for surface acting, deep acting and genuine acting, respectively. Sample items included "In my job, controlling my emotions is very important," "I more often have an artificial smile than natural smile at work," "There is a great big difference between my real emotions and expressed emotions" and "I frequently hide my emotions on the job."

At the same time, the measurement of organizational support was based on the one proposed by Friedman and Greenhaus (2000) with six items, such as "The organization values my contribution to its well-being.," "The organization really cares about my well-being," "The organization cares about my general satisfaction at work.," "The organization takes pride in my accomplishments at work." Meanwhile, Kong et al. (2012)'s refined scale of career competences was adapted and adopted, with six items for examination. Sample items were "I seek out opportunities for continuous learning" and "I have a diversified set of job-related skills." At last, the scale measuring career commitment was refined from that used by Blau (1999), consisting of six items like "If I had all the money I need without working, I would probably still continue in this profession," "I would recommend a career in the hospitality industry to others" and "I am disappointed that I ever entered this profession." All the items were measured on a seven-point Likert scale with 1 being "strongly disagree" and 7 being "strongly agree."

Data collection and analysis

A self-administered questionnaire was developed and distributed to 450 frontline employees in three five star international-brand hotels in Shanghai, China in mid-2022. The benchmark criteria for the interviewee were set at full time employee with more than 6 months of working experiences. In light of a quite internationalized workforce at the investigated hotels, the questionnaire was designed in both English and Chinese, although the nationality and native language were not solicited given the research purposes of this study. While the survey was being filled, trained interviewers would assist with clarification issues when necessary. Out of the 450 copies of surveys distributed, 406 were returned and 387 were determined to

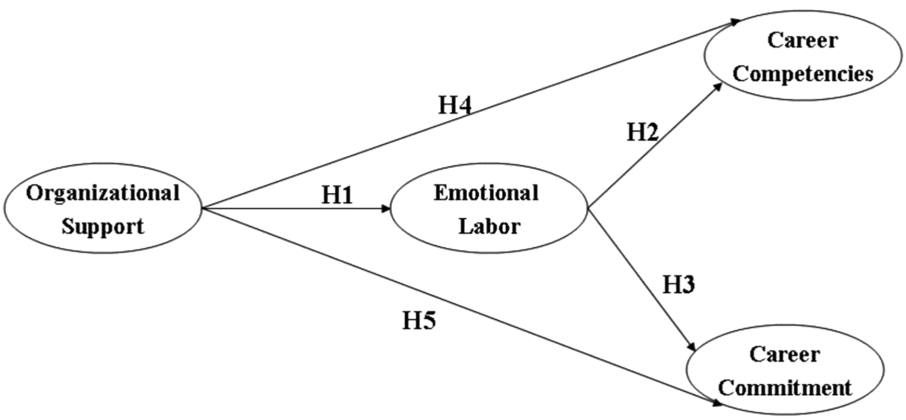

FIGURE 1
Conceptual framework.

be valid for further analysis after initial examination, recording a response rate of 86%, which reached a satisfactory level for further data analysis.

The data analysis process consisted of two steps. Firstly, a confirmatory factor analysis (CFA) was conducted to investigate the internal validity and reliability of the proposed scale. This stage included the examination of dimensionality and convergent and discriminant validity (Anderson and Gerbing, 1988); secondly, the structural equation model (SEM) was applied to test the fitness of the proposed model and the hypotheses developed early. The computer software of SPSS 15.0 and AMOS 17.0 were employed in data categorization and model evaluation.

Profile of respondents

The valid interview participants served in front office, housekeeping, food & beverage, recreation and marketing departments of the hotel, with 32.4% indicating intra-or cross-departmental experiences. There were 42.3% males and 57.7% females. The age range of 20–30 years recorded the greatest proportion at 68.0%, followed by 31–40 years (18.2%) and 41–50 years (12.4%). The majority of respondents reported holding a bachelor's degree (46.7%), followed by secondary school (36.2%), graduate (13.2%) and below secondary school (3.9%). In terms of working experiences, the distribution turned out to be quite even among the categories of 1–5 years, 5–10 years and over 10 years. Particularly, employees who had working experiences at more than two hotels accounted for 52.3% of the total, while 37.5% of the respondents reported to have had worked at other service industries before taking the job at the hotel.

Results

Confirmatory factor analysis of individual measurement model

The CFA was conducted to investigate the reliability and then validity of the respective proposed measurements with the other subsamples, with the results manifested in Table 1. Overall, as the composite measures of reliability of the examined variables all stayed above 0.70, satisfying the criteria suggested by Hair et al. (2014), it was found that the items concerned were reliable in indicating their corresponding dimensions and that a satisfactory level of internal consistency within each proposed dimension was achieved. As is stipulated by Byrne (2010), standardized factor loadings with a value of less than 0.5 were deemed insignificant and prone to the possibility of cross-loading. Therefore, 5 items were discarded from the proposed scale of emotional labor due to falling below the level of 0.5, including 2 from the surface acting and deep acting dimensions, respectively, and one from the genuine acting dimension; meanwhile, two items were dropped from the original scale for organizational support, while one item each was voided from the proposed measurements of career competencies and career commitment.

All of the measurement models reported goodness-of-fit indices that could establish an acceptable fit between the model and the sample data: (1) emotional labor measurement model ($x^2 = 436.32$, $df = 27$, CFI = 0.91, GFI = 0.94, RMSEA = 0.07); (2) organizational support measurement model ($x^2 = 373.24$, $df = 22$, CFI = 0.93, GFI = 0.91, RMSEA = 0.07); (3) career competences measurement model ($x^2 = 321.61$, $df = 25$, CFI = 0.93, GFI = 0.92, RMSEA = 0.07); (4) career commitment measurement model ($x^2 = 406.97$, $df = 19$, CFI = 0.91, GFI = 0.93, RMSEA = 0.07). According to the criteria offered by Hu and Bentler (1998), CFI and GFI values over 0.9 were deemed as acceptable for model fit. Accordingly, the proposed scales were all uniquely related to their respective dimensions and a satisfactory level of convergent validity was obtained. Then, discriminant validity of the scale was assessed to further validate the proposed scale of switching costs. Here, average variance extracted (AVE) analysis (Henseler et al., 2015), was adopted. It was shown by the results as in Table 2 that the square root of the average variance for each of the proposed dimensions was greater than any of the inter-correlations of the dimensions. This analysis therefore gave additional support for the discriminant validity of the proposed scale.

The overall measurement model, which recorded the goodness-of-fit indices of $x^2 = 1034.77$, $df = 271$, CFI = 0.90, GFI = 0.93, RMSEA = 0.07, demonstrated a considerable degree of good fit between the model and the sample data. As the composite measures of reliability ranged from 0.78 to 0.91, a sound fit had been established between the overall measurement model and the data.

Structural model

Lastly, the structural model was tested to evaluate the hypothesized relationships among the variables. The model fit indices were reported as follows: $x^2 = 1103.26$, $df = 282$, CFI = 0.93, GFI = 0.91, RMSEA = 0.07, thus representing a fit to the data. It was demonstrated by the results that all structural path estimates reported statistical significance (as indicated by C.R. >1.91), meeting the standards specified by Hu and Bentler (1998), and therefore could be validated. The path coefficient value and significant level, which is delineated in Figure 2, illustrate positive and significant structural paths. Thus, with all the direct positive relationships confirmed, all of the proposed hypotheses were proved to be statistically significant and thereby supported. Specifically, the mediating function of emotional labor was consolidated through the Sober Test, with positive indirect effect coefficients (0.36, 0.39) and t-values (6.73, 7.09). Accordingly, it could be concluded that emotional labor had mediated the effects of organizational support on career competences and career commitment.

Besides, multiple regression analyzes were conducted to scrutinize the specific effects of the respective dimensions of emotional labor and cross-examined with the criterion as suggested by Hair et al. (2014). It was revealed that organizational support exerted a positive effect on the construct of genuine acting ($\beta = 0.63$, $p < 0.001$), a negative effect on the construct of surface acting ($\beta = -0.20$, $p < 0.001$), and little effects on the dimension of deep acting. On the other hand, career competences were discovered to be positively influenced by deep acting and genuine acting ($\beta = 0.38$ and 0.40 respectively), while little influenced by surface acting. Finally, the impacts of emotional labor dimensions on career commitment were similar to those on career competences, with deep acting and genuine acting indicating positive influences ($\beta = 0.27$ and 0.31 respectively) and surface acting reporting negative effects ($\beta = -0.24$).

Discussion

This study, through comprehensive modeling and systematic analyzes, investigates the relationships among emotional labor and

TABLE 1 Confirmatory factor analysis of dimensions of examined factors (N=387).

Construct	Dimensions	Standardized dimension loading	Composite reliability
Emotional labor			0.76
Surface acting			
	Surface acting		0.80
	1. I often pretend to have the emotions I need to show for customers	0.78	
	2. I often fake to customers that I am in a good mood	0.70	
	3. I can create a look of concern for the client when in reality I am not	0.68	
	4. I often put on an act in order to deal with customers	0.66	
	5. Even if I am in a bad mood, I can leave a good impression with the customers	0.66	
Deep acting			
	Deep acting		0.71
	1. I can manage my emotions to help me understand the customers' perspectives	0.72	
	2. I try to feel the positive emotions I must show to the customers	0.70	
	3. I can separate my feelings enough to deal with tough customers	0.70	
Genuine acting			
	Genuine acting		0. 77
	1. I feel it is difficult not to express my real emotions at work	0.64	
	2. I feel embarrassed for the difference between real emotions and expressed emotions	0.76	
Organizational support			
	Organizational support		0.91
	1. The organization really cares about my well-being	0.71	
	2. The organization takes pride in my accomplishments at work	0.76	
	3. The organization appreciates any extra effort from me	0.92	
	4. The organization shows great concern for me	0.67	
Career competences			
	Career competences		0.78
	1. I have clear career insight.	0.53	
	2. I am open to experience	0.66	
	3. I have career-related skills	0.71	
	4. I seek advice from mentor about my career development	0.70	
Career commitment			
	Career commitment		0.784
	1. I definitely want a career for myself in my current area	0.56	
	2. If I could do it all over again, I would choose to work in this profession	0.62	
	3. If I had all the money I need without working, I would probably still continue in this profession	0.57	

significant human resource management constructs of organizational support, career competences and career commitment. As has been illustrated by the SEM results, there exist positive effects of emotional labor on career competences and career commitment, with organizational support exerting the mediating role on such influences. Findings of this study, therefore, present a complementary perspective on the mechanism of emotional labor in accounting for the organizational behaviors of the employee, from upon which valuable academic as well as practical implications can be derived.

Theoretically, this study makes it due contributions to literature by evaluating the impacts of emotional labor in a managerial context, thereby enriching current literature which is dominant with employee-centered elaborations on emotional labor. Results of this study, as evidenced by the confirmations of hypotheses 1–3, have consolidated the considerable influences of emotional labor on major career management constructs of the employee, which empirically echoes the articulations of Pizam (2004) and Kim (2008) that emotion management has become one of the lifelines of the tourism and hospitality industry. The tourism and hospitality industry is one of the most emotion-intensive in the service sector, and has to adapt itself constantly to a more and more diversified and demanding market, requirements for more personalized and all-around services, as well as integrations of 'the human factor' with latest technological advances

TABLE 2 Correlation and discriminant validity.

Constructs	Mean	Standard deviation	AVE	SA	DA	GA	OS	CMC	CC
Surface acting (SA)	5.047	1.362	**0.690**	**0.789**					
Deep acting (DA)	5.331	1.340	0.628	0.520**	**0.792**				
Genuine acting (GA)	5.701	1.267	0.681	0.461**	0.567**	**0.791**			
Organizational support (OS)	5.092	1.399	0.751	0.488**	0.483**	0.347**	**0.751**		
Career competencies (CMC)	5.155	1.490	0.599	0.421**	0.455**	0.405**	0.515**	**0.779**	
Career commitment (CC)	5.081	1.441	0.702	0.379**	0.487**	0.350**	0.452**	0.463**	**0.838**

**Correlation is significant at the 0.01 level (2-tailed). Bold font is square-root of AVE.

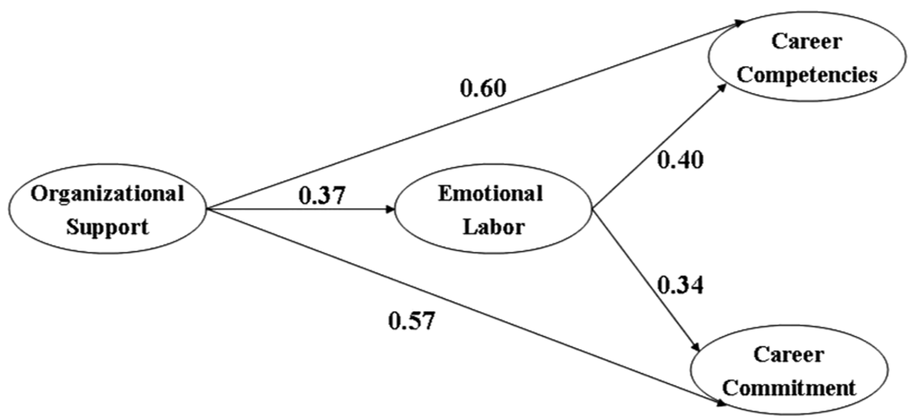

FIGURE 2
Estimated measurement paths.

(Xu, 2007). All of such challenges, when complicated by the emergency of the generations Y and Z into the workforce who themselves are characterized by self-centered personalities and unscrupulous expressions of genuine emotions, highlight the significance of management of emotional labor in addressing the needs of the customers as well as promoting psychological well-being of the employees. As emotional labor has been found from examinations of hypotheses 2–3 to positively contribute to career competences and career commitment of the employee, it can be assumed here that emotional labor may serve as an empowering force that can inspire the motivations for and identification of the employee with his/her career, just as has been suggested by Pugliesi (1999). In this sense, emotional labor can be articulated as a facilitator of the positive attitudinal psychological dynamics of the employee, particularly when the genuine emotions of the employee are consistent with those expected by the job.

With regard to the specific impacts of the three dimensions of emotional labor, the contrast in the effects of surface, deep and genuine acting in enhancing the level of career competences and career commitment of the employee is consistent with the results of previous studies reporting diversified influences of different categories of emotional labor on major consequence factors (Yan et al., 2012). In the condition of surface acting, the employee fakes an organizational identity which is detached from his or her authentic feelings, while deep acting mobilizes the employee's willpower to attach to his or her organizational identity, with genuine acting representing the congruity between the employee's own feelings and those required by the job. In this sense, an ascending order of mental activeness and consistency is observed in surface, deep and genuine acting, which would consequently shape the level of attitudinal inclinations of the employee toward his or her career. As has been put by Chu and Murrmann (2006), emotional labor is a contagion that closely regulates the direction and intensity of other significant psychological traits. This is further supported by the natures of career competencies and career commitment, which are based on the subjective perceptions and evaluations made by the employee, are inherently underlined by emotion-laden foundations (Liu et al., 2004). When employees identifies with the work emotionally, they would be more motivated to accrue competencies which would better facilitate their career path, and be more loyal and committed to the career. This is especially the case under the scenarios of demanding job responsibilities or tough customers, when positive emotional labor would sustain and enhance the psychological attachment of the employee to the organization and prevent burnout and quitting (Brotheridge and Lee, 2003).

Implications

While it has been argued by some studies that emotional labor is deeply embed into the realm of personalities and quite immune from external influences (Chu et al., 2011; Gursoy et al., 2011), there still exists vast potential for the realization of an emotional-fit between the employee and the organization, so that the positive effects of emotional labor can be optimized. This is best demonstrated by the findings of this study on the mediating roles assumed by organizational support on emotional labor as revealed by testing of hypotheses 4 and 5. In a sense, organizational support can be regarded as the emotional rewards offered by the organization that aim to arouse corresponding emotional identifications and concrete behaviors from the employee. In the hospitality industry, which is already crippled by comparatively low salaries and material benefits, emotional supports from the organization in the forms of care, concern, appreciation, etc. would not only induce due social exchange responses from the employee, but also provide a reliable emotional harbor when the employee encounters problems and challenges. Although this study does not confirm a determining role of organizational support, it does reveal a unique and valuable channel through which the organization can strike an emotional resonance with employees.

Practically, pertinent strategies and solid measures can be proposed and implemented to best utilize emotional labor in improving service quality as well as enhancing customer experiences in the hospitality industry. With modern consumptions strongly underscored by experiences of the product or service by customers, close attention to the emotional health of the employees whose feelings and expressions are integral to customer experiences will definitely be a pertinent demonstration of agile organizational leadership that heralds employee attachment and career endorsement, especially in face of uncertain challenges like the pandemic. Firstly, sessions on emotional management and adjustment should be highlighted in the training and career development programs, with the objective of integrating the genuine emotions of the employee into their work. Meanwhile, based upon the dimensionality of emotional labor explored by the research findings, workshops featuring role plays should be held incorporating perspective of the psychology of customers, based upon which the deep acting tactics and approaches which would be most effective can be customized and tailor-made. Experiences from the performing arts sector, which have already been applied in the theme park industry, seem to offer tenable references here with the emphasis of 'theatrification' of services (Ellis and Rossman, 2008). Moreover, at the senior level, corresponding to the research findings from investigations of hypotheses 1–3, the organizational culture should be modified correspondingly so that a better employee-organization fit in emotional terms can be achieved. This would be of particular merits in soliciting the younger generations of workforce featured with strong predilection for employers which they identify with themselves (Kim, 2008). At last, effective measures should be devised and implemented to substantiate the organizational support for the employees, thus creating amicable contexts for the utilization of the employees' emotional labor.

Limitation and future research

Despite the efforts by this study to comprehensively and systematically examine emotional labor on the managerial spectrum, it is not without limitations to be addressed by future studies. Firstly, the scales measuring the investigated constructs can be further refined and adjusted to account for the mechanisms of emotional labor in a more tenable manner. There might be redundant items that need to be disposed of, and the scales may not be exhaustive. Hence, future research is guaranteed that enriches and enhances the current scales more rigorously, succinctly and in-depth. Especially, a mixed methodology approach can be selected, soliciting other key indices of emotional labor such as frequency, intensity as well as qualitative data, which can then be triangulated to generate new insights into emotional labor in the tourism and hospitality industry. In addition, taking cognizance of the variety of paradigms in deliberations on emotional labor, this study only avails a partial examination of the effects of emotional labor from a limited perspective. Future research may integrate other significant viewpoints and concepts like working experiences, seniority, personality, as well as cultural values in investigation, so as to facilitate a thorough understanding of the mechanism through which emotional labor influences the attitudinal and behavioral traits of the employee. Thirdly, since this study only focuses on the frontline staff working at luxury hotels, there exists the inherent issue of generalizability. Future studies which encompass a broader range of staff origins—preferably with cross-sectional evaluations of employees from different managerial levels—would definitely contribute to a more in-depth understanding of emotional labor in the tourism and hospitality industry. A unique area of considerable interest would be the exploration of emotional labor in employee-to-employee relationships.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The patients/participants provided their written informed consent to participate in this study.

Author contributions

YH: conceptualization. WT: data analysis. XW: literature review. LZ: data interpretation. QY: discussion and conclusion. All authors contributed to the article and approved the submitted version.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

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Holacracy, a modern form of organizational governance predictors for person-organization-fit and job satisfaction

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This study compares illegitimate tasks and appreciation in traditional work organisations and holacracy work organisations based in Switzerland and Germany. In addition, the study tests whether the fit between employees and holacracy organisations depends on personality characteristics. Ninety-five employees working in holacratic companies participated in an online survey with standardised questionnaires on illegitimate tasks, Big Five personality dimensions, perceived holacracy satisfaction and person–organisation fit. For the comparison of illegitimate tasks and appreciation, a propensity-matching comparison group of people working in traditional companies was used. The results revealed significantly lower illegitimate tasks $t(53)=-2.04$, $p<0.05$, with a lower level (2.49) in holacracy than in traditional work (2.78). Concerning appreciation, the results showed significantly higher values for holacratic (5.33) than for traditional work [4.14, $t(53)=4.86$, $p<0.001$]. Multiple linear regression of holacracy satisfaction on personality dimensions showed neuroticism ($b=-4.72$, $p=0.006$) as a significant predictor. Agreeableness showed marginally significant results ($b=2.39$, $p=0.06$). This indicates that people scoring low on neuroticism and high in agreeableness may thrive better in holacracy organisations. Based on the results, theoretical and practical implications as for example implications for corporates hiring strategy, are discussed. Finally, this study presents numerous directions for future research.

KEYWORDS

person–organisation fit, holacracy, self-organisation, big five, job satisfaction

1. Introduction

Holacracy is currently defined as a comprehensively designed internal management system; it has received significant attention for its adoption at Zappos and other big companies (Bernstein et al., 2016), especially the fast-growing sector of technology and start-ups practice holacracy (Kaduthanam and Heim, 2019). Currently, holacracy is the most widely adopted system of organisational self-management (Bernstein et al., 2016).

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According to the official website of holacracy, more than 1,000 companies all over the world are using the holacracy approach (Who's Practicing?, n.d.). Although holacracy is becoming more popular, research on working conditions and well-being of employees working in holacratic organisations is sparse.

The concept of holocracy refers to the development of a new way of structuring and running an organisation that replaces conventional management. That was the goal of the entrepreneur Brian Robertson (Groth, 2014). When Robertson founded his own tech company, he realised that companies nowadays are confronted with a world that is changing more quickly than ever before and that working today means something completely different from before 30 years (Hackl et al., 2017). In his view, the existing methods did not fulfil his demands and traditional forms of organisation would not allow him to react to changes fast enough, and therefore it avoids a successful product development. Consequently, based on the principle of trial and error, his goal was to create a method that allows companies to work together in a more effective and powerful way (Robertson, 2007). In holacratic companies, authority and decisions are distributed throughout circles, and employees no longer have titles anymore but have roles. Roles include a clear objective regarding how they contribute to the organisation and their circle. Once the role no longer provides a benefit, it is removed. Individuals can also hold multiple roles, such as "lead-link," "rep-link," "facilitator" or "secretary." The lead-link represents the circle during meetings, the rep-link represents sub-circles (Van De Kamp, 2014), the facilitator leads the circle through the given holacratic process and the secretary maintains circle records and schedules meetings (Robertson, 2007). Another essential characteristic of holacracy is the constitution of governance guides, which does not specify the implementation of the tasks but how circles must be established and operated. The constitution is stipulated according to which guidelines new roles should arise and how circles should communicate among one another (Bernstein et al., 2016). Again, there is a gap between expectations on how holacracy change work tasks and the empirical evidence on change in work tasks.

In summary, development of holacratic organisation was triggered by task needs but not based on work design theory. Nevertheless, holacratic organisation can be expected to change not only the organisational structure but also the work tasks. To get a better understanding of how holacracy affects employees, the study aims to find out whether specific work conditions like unnecessary tasks and unreasonable work tasks are less common in holacratic work organisation than in traditional work. Moreover, work appreciation is expected to be higher in holacratic compared to traditional work organisation. Therefore, a holacratic work organisation company and a comparison group consisting of people working in traditional companies was examined. Current studies underline the need to systematically analyse new forms of work organisation using work psychology tools and methods (Junker et al., 2022). The first part of this study focuses on differences in work conditions between holacratic and traditional organisations due to increasing relevance and interest in new forms of organisations (Csar, 2017). The goal is to understand and evaluate better these new forms of organising companies by comparing important work conditions, not just organisational structures, at workplaces. The second part of the study focuses on different personality traits as predictors for Person-organisation fit (PoF) and satisfaction with holacracy. The objective is to identify relevant personality traits that predict satisfaction and individual fit with holacracy. So far, only little is known regarding predictors of a good fit for employees within this new organisational form. Some papers used expert interviews (Van De Kamp, 2014), but to the best of our knowledge, no study has explicitly examined predictors of the person–organisation fit in companies implementing holacracy.

1.1. Unnecessary and unreasonable tasks in a holacratic work organisation

In a rapidly changing work environment, deficits in job design are a frequent reason why employees sometimes must complete tasks that are perceived as unnecessary or unreasonable because the tasks do not fit to their occupational role. Unnecessary and unreasonable tasks are described by a psychological construct called illegitimate tasks (Semmer et al., 2010, 2015; Kottwitz et al., 2019). These tasks occur when employees are faced with tasks they feel do not match their occupational role. Semmer et al. (2015) found that illegitimate tasks predicted strain and should, as a result, be seen as a part of job design. This study seeks to investigate whether people who work in holacratic companies experience fewer illegitimate tasks through the concept of self-organisation and high autonomy. One of the main characteristics of holacracy is the "self-governing" approach. Robertson himself explains holacracy as a "rule system for anarchy," thus a system without rulers (Groth, 2014). This results in the selection of tasks and an approach to complete them which is left open to individual discretion (Robertson, 2015). Moreover, in holacratic companies, people work with roles that are constantly being changed or even redefined (Van De Kamp, 2014). This should result in employees experiencing illegitimate tasks less often, as tasks that are perceived to be illegitimate can either be quickly relinquished by adjusting roles, and thus feeling that the new task fits the different roles after all, or by someone else taking over the task and assuming it. According to Semmer et al. (2015), "illegitimate tasks send an implicit message of disrespect that represents a potential threat to the self." The results are noteworthy, because a recently published meta-analysis highlighted that self-esteem had significant prospective effects on job satisfaction, job success, and job resources (Krauss and Orth, 2022). In the case that holacratic structures lead to fewer illegitimate tasks, this would result in a meaningful outcome for organisational psychology.

> *Hypothesis 1*. People who work in holacratic companies will experience fewer illegitimate tasks than people who work in traditional companies.

1.2. Appreciation at work in holacracy

Appreciation at work is an important resource that matches illegitimate tasks as a resource when dealing with different roles (Semmer et al., 2015). Illegitimate tasks are often perceived as implying a lack of appreciation and respect. The idea behind this is that the person to whom the task has been assigned concludes that the person assigning the task has not dealt with their own interests (Kottwitz et al., 2019). Results from Stocker et al. (2010) also showed that (lack of) appreciation mediated the effect of illegitimate tasks on job satisfaction. The importance of appreciation in the workplace is shown by the results of a study by Siegrist (1996), who identified appreciation as an important reward factor and as having a direct influence on job satisfaction (Elfering et al., 2007). In addition to its resource value regarding illegitimate tasks at work, appreciation is a powerful general resource provided by others (Elfering et al., 2007). Specifically, perceived appreciation means being recognised as a valuable person. As a result, self-esteem is strengthened, leading to well-being and higher job satisfaction (Elfering et al., 2007). Appreciation is often associated with leadership and appreciation from the supervisor (Kottwitz et al., 2019). In holacratic companies, supervisors and managers do not exist (Robertson, 2015), but the team has a very high priority. The concept's aim is to create an environment where everyone contributes equally to the success of the company due to missing hierarchies, and everyone follows the same purpose (Robertson, 2007). Moreover, in holacracy there is more and quicker feedback on work processes from more feedback providers. Consequently, employees receive more positive feedback, which is a primary source of work appreciation (Semmer et al., 2015). The absence of hierarchy and improved feedback contribute to a respectful work climate and appreciation among the team (Kottwitz et al., 2019). Results of a recently published study support these findings, which identified that holacracy creates an opportunity for appreciation since all tasks and functions become visible and cannot be overlooked anymore (Schell and Bischof, 2021). Moreover, the fact that in meetings roles and tasks are constantly reviewed leads to high transparency and awareness regarding the importance of each task (Schell and Bischof, 2021). Based on these findings, the following hypothesis was formulated:

> *Hypothesis 2.* People who work in holacratic companies will experience higher appreciation than people who work in traditional companies.

1.3. Person–organisation fit in holacracy

A second research question refers to personality as a predictor for person–organisation fit in holacracy. One of the most known implementations of holacracy is Zappos, an online retailer with 1,500 employees in 2014 (Van De Kamp, 2014). When the CEO of Zappos decided to introduce holacracy, he sent a letter to his employees stating that self-management and self-organisation would become the most important requirements. But "self-management and self-organisation is not for everyone, and not everyone will want to move forward in the direction," he said. That is why he offered severance packages to the employees for whom holacracy was not a good fit at their own discretion (Bernstein et al., 2016). Researchers also claim that holacracy will most likely not work for everyone (Van De Kamp, 2014; Schermuly, 2019). Van De Kamp (2014) states that people who have insufficient self-management skills might face difficulties with holacracy. Rough estimates that a potential lack of fit with holacracy can be inferred from numbers reported at Zappos, i.e., the 18% of Zappos employees who decided to take the severance package and leave the company (Bernstein et al., 2016). A recent study argues that in many cases new work approaches are focusing on the structures of companies instead of on the people who work there. According to Schermuly (2019), most of the new work initiatives fail because of that. Depending on personality characteristics, the same structures at work can be perceived differently. Thereby, the present study aspires to investigate for whom holacracy will probably be a good person-organisation fit. Person–organisation fit is the compatibility between employees and an organisation (Kristof, 1996). Identifying predictors may be important for human resources managers, who in the future could primarily employ those who are likely to be satisfied with holacratic structures and might benefit from the various advantages of person–organisation fit. Companies could also use these predictors to avoid employee resignations due to a low person–organisation fit (Kristof-Brown et al., 2005). In order to capture a comprehensive taxonomy of personality through a manageable number of items, this study uses the five-factor model (Ostendorf, 1990; Costa and McCrae, 1992). Studies show that personality is also associated with self-regulation, as it generates individual differences in emotion, thought and behaviour (Gramzow et al., 2004). Johnson et al. (2013) showed that self-regulation is closely linked to the person–environment fit and claim, and that person–environment fit should be seen through the lens of a self-regulation framework. They conceptualised person–environment fit as a discrepancy between the ideal conditions for people and the experienced conditions.

Accordingly, the assumption of this study is that holacracy, with all its facets, requires self-regulatory characteristics that are bound to personality and decide the fit between employee and organisation. The goal is to find what kind of personality fits the holacracy approach and leads to satisfaction with this model, as there is no hierarchy in holacracy anymore.

The five-factor model of personality comprises extraversion, neuroticism, openness to experience, conscientiousness and agreeableness. Each category represents a broad domain that consists of more explicit personality traits (Zhao and Seibert, 2006). A person who scores high on extraversion can be described as active, dominant and enthusiastic (Costa and McCrae, 1992). Low values for extraversion imply that a person prefers to spend time alone and could be described as quiet and reserved. As there is no hierarchy anymore, the distribution of tasks is left open to employees. If someone is more extraverted, this person might get easier access to tasks they would like to accomplish because they are sociable, active and talkative. Also, for people working in a holacratic company, they will be most likely to spend more time with other people because of the constant interactions with their colleagues; ergo, teamwork is key. Thereby this person would feel that the organisation is fulfilling their needs. Taking that into account, it is possible to infer the following:

> *Hypothesis 3*. In holacracy, people who score higher on extraversion also score higher on the *person–organisation fit* scale, meaning that a positive correlation between *extraversion* and *person–organisation fit* is expected.

Neuroticism indicates the emotional stability of a person. People with high values for neuroticism could be described as anxious, impulsive and vulnerable. On the other hand, low levels on the scale result in characteristics like calmness, self-confidence and relaxation (Costa and McCrae, 1992). Employees working in holacratic companies experience an unstructured environment that requires a lot of responsibility. Self-confidence and evenness seem to be important characteristics to handle holacratic structures and experience a high *person–organisation fit*. For this reason, the following can be posited:

> *Hypothesis 4*. In holacracy, people who score low on *neuroticism* score higher on the *person–organisation fit* scale, meaning that a negative correlation between *neuroticism* and *person–organisation fit* is expected.

Openness to experience covers the desire to constantly discover new things and have new experiences. High values for this dimension imply that a person is innovative, imaginative and interested in art and music, for example. Moreover, it means that they are attentive to the emotions of other people and to their own. Low values in contrast imply that someone prefers routines, is traditional and uncreative (Costa and McCrae, 1992). Some studies have discovered that creativity, which is part of openness to experience, is a predictor for entrepreneurship (Shane and Nicolaou, 2015). For instance, Shane and Nicolaou (2015) found high correlations between creativity and the likelihood of starting a business. In their study, Hamidi et al. (2008) also found high correlations between inventiveness and entrepreneurial intentions. Holacracy, along all its facets, encourages employees to act like an entrepreneur. Additionally, in holacratic companies everyone can contribute their ideas, so there is plenty of room for openness to experience (Krasulja et al., 2016). Considering these different insights, the following hypothesis has been formulated:

> *Hypothesis 5*. In holacracy, people who score higher on *openness to experience* score higher on the *person–organisation fit* scale, meaning that a positive correlation between *openness to experience* and *person–organisation fit* is expected.

Conscientiousness describes how organised, hardworking, motivated and self-controlled a person can be. This means that they will be able to formulate goals, to plan them, and to work hard to accomplish them (Costa and McCrae, 1992). In holacracy, self-organisation becomes one of the most important skills. Employees have different roles and responsibilities, so prioritising becomes key. Lack of self-organisation competence could result in overtaxation and could therefore lead to a low *person–organisation fit* because it feels like the employer does not match the required abilities. Therefore, the expectation is as follows:

> *Hypothesis 6*. In holacracy, people who score higher on conscientiousness score higher on the *person–organisation fit* scale, meaning that a positive correlation between *conscientiousness* and *person–organisation fit* is expected.

A person with high values for agreeableness tends to be warm, trusting, altruistic and caring. Low values, in contrast, result in ruthlessness, manipulation and mistrust (Costa and McCrae, 1992). According to Bernstein et al. (2016), the time spent in meetings increases in holacratic companies, so a significant number of interactions with other people is always demanded. In order to avoid conflicts and to maintain friendly relationships, employees must show trust, courtesy and cooperativeness, elements that belong to the concept of agreeableness. Individuals who score high on agreeableness should be more eager to interact with others in a positive way without triggering conflicts. Also, they should experience that selfish behaviour is not accepted. Gary Hamel, professor at the London Business School, argues that people who show agreeable behavior will handle holacracy better than egoistic people (Hamel, 2012). A possible explanation for that could come from a recently published study from Hughes et al. (2022) where it was assumed that agreeableness is a relevant factor for determining the extent to which an interpersonal stressor is assessed as a threat to the self-esteem, because agreeable employees are probably more likely to forgive rude or unhelpful behavior and may not perceive this kind of behavior as a threat to self-esteem. Moreover, low values on agreeableness could lead to more dysfunctional support (Semmer et al., 2006) within the team and thereby negatively affect the perceived PoF. Taking this into account, this study will investigate this dimension in more detail because agreeableness is assumed to be a relevant factor for holacracy.

> *Hypothesis 7a*. In holacracy, people who score higher on *agreeableness* score higher on the *person–organisation fit* scale, meaning that a positive correlation between *agreeableness* and *person–organisation fit* is expected.
> *Hypothesis 7b*. In holacracy, people who score higher on *agreeableness* score higher on the *holacracy satisfaction* scale,

meaning that a positive correlation between *agreeableness* and *holacracy satisfaction* is expected.

2. Method and materials

2.1. Participants

The recruitment of participants for this questionnaire study took place in December 2020 *via* social media, especially *via* LinkedIn, because the social network allowed to contact people without the need for a personal connection. An *a priori* power calculations were performed and a sample size of 100 participants ($N=100$) was shown. Due to certain exclusion criteria, only 95 responses could be included in the calculations. A total of 240 people clicked on the link, of whom 115 participated in the survey, 95 of whom completed the questionnaire. This resulted in a final sample size of 95 ($N=95$) participants, 41 of whom were female ($n=41$) and 44 of whom were male ($n=54$). The average age of participants was between 31 and 40 years old. The youngest participants were between 20 and 30 years old, and nobody was older than 60 years. Of all participants, 76% were between 20 and 40 years old, 43% were Swiss (the German speaking part), and 57% were German. Due to data protection, the exact age of the respondents was not recorded, as only the age range was requested as a means to avoid drawing conclusions about a person based on their age. Around one third of participants were single, while one third indicated they were in a partnership, and one third were married. All participants were working for a company that used the holacracy approach at the time of the survey. Forty-seven percent of participants worked for a company in the technology sector. In terms of elected roles within holacracy (lead-link, rep-link, facilitator, secretary), most participants (38%) reported having taken the role of lead-link; 13% the role of rep-link and 26% no elected role. All data were collected completely anonymously. The respondents were informed about the content of the study and their voluntary participation. The participants in the comparison sample were employed persons from German-, French- and Italian-speaking Switzerland. In total, 2,846 ($N=2{,}846$) participants took part in the study, of whom 46.9% were female and 53.1% male. Eleven percent were between 16 and 24 years old, 34% between 25 and 39 years old, 35% between 40 and 54 years and 18% between the 55 and 65. Most of them spoke German (70%) and worked full-time (Galliker et al., 2020). The language of the study was German, and this evaluation was approved by the Ethics Committee of the University of Bern, Switzerland (Ethics No. 2019–01-00005).

2.2. Materials

2.2.1. Questionnaires

The first research question compares a holacratic work organisation to a traditional work organisation with respect to illegitimate tasks and *appreciation*. The second research question uses only the participants who worked in a holacratic work organisation. In this study, *the Big Five* personality dimensions were tested to predict holacracy satisfaction and person–organisation fit. All inquiries, apart from demographic questions and the item on *holacracy satisfaction*, are based on existing questionnaires and scales with good psychometric reliabilities and validities. The demographic section consists of five questions. The first one addresses gender, offering the options "male," "female" and "diverse." The second question addresses age, offering seven options ($1 \leq 20$, $2=20$–30, $3=31$–40, $4=41$–50, $5=51$–60, $6=61$–70 and $7=71$–80). The third question concerns marital status, with three response options (1 = single; 2 = married; 3 = living in a partnership). The next question refers to the elected roles, with five options (1 = lead-link, 2 = rep-link, 3 = facilitator, 4 = secretary, 5 = none of the above). The final question queries the industry of the employee.

The Bern Illegitimate Tasks Scale (BITS; Semmer et al., 2010) assesses illegitimate tasks. This study used two items that were proposed as a short measure by the author(s) of the BITS: one of them measures unnecessary and unreasonable tasks. For unnecessary tasks, participants were asked, "Do you have work tasks to take care of, which keep you wondering if they have to be done at all?" For unreasonable tasks, participants were asked, "Do you have work tasks to take care of, which you believe should be done by someone else?"

Appreciation was measured by asking the participants to assess to what degree they agreed with the following statement: "I generally feel appreciated at my workplace." This item also used a 7-point Likert scale (Jacobshagen et al., 2008).

The short version of the MRS inventory by Schallberger and Venetz (1999) was used in this study to measure the Big Five personality dimensions. The short version of the MRS inventory is based on the MRS inventory by Ostendorf (1990) and Ostendorf and Angleitner (1992). The short version of the MRS inventory consists of 30 bipolar items with a 6-point Likert scale. Cronbach's alpha for all five personality scales ranged between $\alpha=0.65$ and $\alpha=0.81$.

To measure the *person–organisation fit,* the four items were based on the scale developed by Saks and Ashforth (2002), using a 5-point Likert scale ranging from 1 (to a very little extent) to 5 (to a very large extent). This section included questions such as "To what extent are the values of the organisation similar to your own values?" Cronbach's alpha for all four items was $\alpha=0.89$.

Additionally, one item to measure *satisfaction with holacracy* was included. *Holacracy satisfaction* was measured by asking participants the following: "How satisfied are you with holacracy as a form of organisation?" The response scale was a 5-point Likert scale from 1 (very satisfied) to 5 (very unsatisfied).

The questionnaire was designed with the programme Socisurvey.[1] The study was conducted online and consisted of three different phases. The first segment contained demographic

1 https://www.soscisurvey.de/

questions, and the second part consisted of inquiries regarding personality. More precisely, the survey recorded the Big Five. The participants answered questions about their satisfaction with holacracy and person –organisation fit. The survey lasted approximately 7 mins per person. The online survey consisted of a pool of 38 questions, and the survey period was between 12/20/2020 and 1/15/2021. Initially, online research was conducted to identify companies that publicly stated they were working with *holacracy*. Participants received the survey link through LinkedIn by contacting employees who stated they work at a *holacratic* company or through the human resources departments. All participants were informed that the prerequisite for participation was employment at a holacratic company.

The questionnaire began as soon as a participant clicked on the link. They first saw a welcome text informing them about the purpose of the study, a brief overview of the questions and the anonymity and voluntariness of the study. They responded to demographic questions at the beginning, followed by an information text that prepared the participants for the personal questions. They then responded to inquiries related to the Big Five. Participants answered all five dimensions on one page, then responded to questions on *holacracy satisfaction*, *person–organisation fit* and all remaining questions together on one page. The average time needed to answer the survey was 7 mins 30 s ($M = 441.53$, $SD = 112.79$, unity = seconds).

2.3. Data analysis procedures

2.3.1. Propensity-matching approach

To investigate whether the work conditions differ between holacratic and traditional organisations, this study used the propensity-matching approach to compare the findings from the original study. Some data were analysed from a Swiss study called *Job-Stress-Index 2020*. Since 2014, Health Promotion Switzerland has been regularly collecting key figures on work-related stress and its correlation with the health and productivity of employees in Switzerland. The study was conducted in February 2020.

The total number of participants was 2,846 (N = 2,846), of whom 1,389 were female and 1,457 male. The propensity-matching approach involves finding a twin for each participant so that the results can be compared more efficiently. This proposal has its basis on three categorical variables: age, gender and industry. Since the two studies differed slightly in their response options for the item industry, a few response options were combined by the JSI into one industry. As an example, in the present study there was the industry "Finance, Real Estate and Insurance" as an answer option. In the JSI data set, there was the industry of "8. Credit and Insurance" and "9. Real Estate, other economic services." These two industries were then combined into one. By using this principle, it was possible to find a twin for 52 of a total of 115 participants, who gave identical answers in all three categories. This allowed for a T-test for dependent samples to be conducted to compare both groups.

Regarding the data analysis, this study used R Studio version 1.2.5001. In the first step, answers from 20 participants were removed due to incompleteness. Moreover, irrelevant variables, such as the starting time of each participant, were removed. Building the scales first involved recoding negatively keyed items. Following this, each scale was created by summarising the relevant items. An alpha level of 0.05 was used, and the tests were two-tailed.

3. Results

3.1. Descriptive statistics

In the first step, we analyzed whether typical control variables like age and gender are correlated to the main concept's person-organisation fit, holacarcy satisfaction and illegitimate tasks. No gender differences could be found regarding the main concepts. For age, only person-organisation fit showed a significant positive correlation [r (94) = 0.2, $p = 0.49$; Tables 1, 2].

3.2. Hypothesis testing

Hypotheses 1 and 2 investigated the differences between holacratic and traditional organisations and therefore involve a comparison of employees in holacratic vs. traditional organisations; hypotheses 3 to 6 focused on the predictors for person–organisation fit, and used only the sample of people working in holacratic organisations (Table 3).

3.2.1. Hypothesis 1

To investigate whether people who work in holacratic companies significantly experienced fewer illegitimate tasks than people who worked in traditional companies, a T-test was performed to check significant group differences. The results revealed significant differences between both groups t (53) = −2.04, $p < 0.05$, $d = 0.57$, in which employees working in holacratic organisations showed lower mean values (2.49, SD = 0.65) than employees working in traditional organisations (2.78, SD = 0.64; Figure 1).

3.2.2. Hypothesis 2

It was assumed that people who worked in holacratic companies would experience significantly higher appreciation than people who worked in traditional companies. A T-test was conducted to verify significant group differences between holacratic organisations and traditional companies. The results revealed significant group differences t (53) = 4.86, $p < 0.001$, $d = 0.81$, in which employees working in holacratic organisations showed a higher mean level (5.33, SD = 1.41) than employees working in traditional organisations (4.14, SD = 0.81; Figure 2).

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TABLE 1 Overview of all research hypotheses including a separation in the two groups comparison between holacarcy organisations and traditional organisations and analysis only within holacracy organisations.

Comparison between Holacracy-organisations & traditional organisations	Analysis only within Holacracy-organisation	
Hypothesis 1: fewer illegitimate tasks in Holacracy organisations +	**Hypothesis 3:** positive correlation between extraversion and PoF -	
Hypothesis 2: higher appreciation in Holacracy organisations +	**Hypothesis 4:** negative correlation between neuroticism and PoF +	
	Hypothesis 5: positive correlation between openness to experience and PoF -	
	Hypothesis 6: positive correlation between conscientiousness and PoF -	
	Hypothesis 7a: positive correlation between agreeableness and PoF (+)	**Hypothesis 7b:** positive correlation between agreeableness and Holacracy Satisfaction +

Hypotheses marked with a "+" indicate that results supported the hypothesis, Hypotheses marked with a "-" indicate that results rejected the hypothesis, Hypotheses marked with a "+" indicate that results were marginally significant ($p = 0.06$).

TABLE 2 Descriptive statistics and reliability of the scales.

Variable	*M*	*SD*	Min	Max	Cronbachs α
Openness	4.51	0.63	3.17	6	0.73
Extraversion	4.17	0.87	2	6	0.81
Neurotizism	2.43	0.62	1.17	4	0.67
Conscientiousness	4.64	0.68	2.5	6	0.79
Agreeableness	4.63	0.58	2.83	5.67	0.65
Person-organisation-fit	3.94	0.72	1.5	5	0.89
Illegitimate tasks	2.45	0.81	1	5	
Appreciation	5.36	1.36	1	7	

$N = 95$, M = Mean, SD = Standard Deviations.

3.2.3. Hypothesis 3

This hypothesis investigated the correlation between *person–organisation fit* and *extraversion.* A Shapiro–Wilk test was conducted to check the normality in the distribution of the data. Due to the normal distribution for both variables ($p > 0.05$), a Pearson correlation was performed to test the first hypothesis. The results did not show a significant correlation between *extraversion* and *person–organisation fit* [r (94) = 0.01, $p = 0.95$].

TABLE 3 Pearson correlations of person–organisation fit and holacracy satisfaction with personality traits.

Variable	Person-organisation-fit	Holacracy satisfaction
Extraversion	0.01	−0.01
Neurotizism	−0.27**	−0.32**
Conscientiousness	0.05	0.11
Agreeableness	0.19	0.23*
Openness	0.16	0.08
Unreasonable tasks	−0.21*	−0.13
Unnecessary tasks	0.32**	−0.26*
Person-organisation-fit	1	0.44**
Appreciation	0.55**	0.24*

$N = 95$, $*p < 0.05$, $**p < 0.01$.

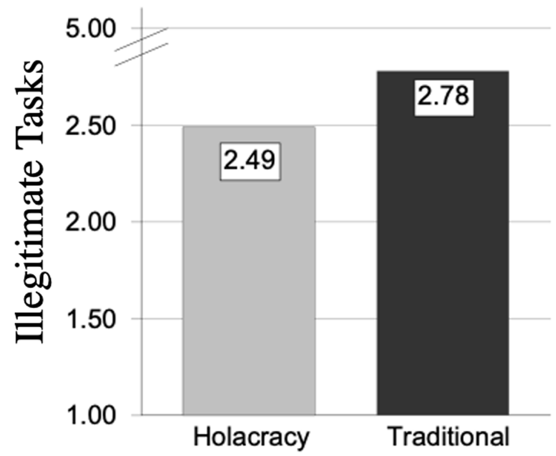

FIGURE 1
Main values of illegitimate tasks in holacratic organisations and traditional organisations.

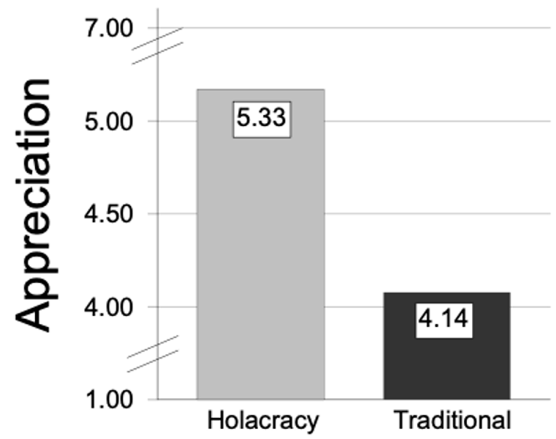

FIGURE 2
Main values of appreciation in holacratic organisations and traditional organisations.

3.2.4. Hypothesis 4

This hypothesis investigated the correlation between *neuroticism* and *person–organisation fit*. A Shapiro–Wilk test was conducted to check the normality in the distribution of the data. Due to the normal distribution for both variables ($p > 0.05$), a Pearson correlation was conducted to test the first hypothesis. The results showed a significant correlation between *neuroticism* and *person–organisation fit* [r (94) = −0.27, $p < 0.001$]. The results of the linear regression showed that *neuroticism* could be identified as a significant predictor for *person–organisation fit* [b = −4.72, t (93) = −0.32, $p = 0.006$. $R^2 = 0.07$ F (1, 93) = 3.6, $p = 0.006$; Table 4].

3.2.5. Hypothesis 5

The fifth hypothesis investigated the correlation between *openness to experience* and *person–organisation fit*. Again, a Pearson correlation was conducted due to normality in the distribution of the data (Shapiro–Wilk test $p > 0.05$). There was no significant correlation found between *openness to experience* and *person–organisation fit* [r (94) = 0.16, $p = 0.11$].

3.2.6. Hypothesis 6

The sixth hypothesis investigated the correlation between *conscientiousness* and *person–organisation fit*. A Pearson correlation was conducted due to normality in the distribution of the data (Shapiro–Wilk test $p > 0.05$). The results showed no significant correlation between *conscientiousness* and *person–organisation fit* [r (94) = 0.05, $p = 0.62$].

Hypotheses 7a and 7b analysed the relationships between *agreeableness* and *person–organisation fit* and between *agreeableness* and *satisfaction with holacracy*.

3.2.7. Hypothesis 7a

A Pearson correlation was conducted to analyse the correlation between *agreeableness* and *person–organisation fit*. The results showed marginal significant positive correlation between *agreeableness* and *person-organisation fit* [r (94) = 0.19, $p = 0.06$]. A linear regression was conducted to investigate whether *agreeableness* is also a predictor for *person–organisation fit*. The relationship was visualised to provide a first impression regarding these variables. The linear relationship was rather weak. The results of the linear regression showed that *agreeableness* could not be identified as a significant predictor for *person–organisation fit* [b = 2.83, t (93) = 0.23, $p = 0.06$. $R^2 = 0.04$ F (1, 93) = 3.6, $p = 0.06$] when holding tight to the significance level of 0.05 (Table 5).

3.2.8. Hypothesis 7b

In addition, for this hypothesis, a Pearson correlation was conducted to investigate the correlation between *agreeableness* and *satisfaction with holacracy*. The results showed a significant positive correlation between *agreeableness* and *satisfaction with holacracy* (r_s (94) = 0.22, $p = 0.03$). The linear relationship—weak to moderate—between these two variables was plotted for further analysis.

Following this, a linear regression was performed. The predictor was *agreeableness*, and the dependent variable was *satisfaction with holacracy*. *Agreeableness* was shown to be a significant predictor for *satisfaction with holacracy* [b = 2.13, t (93) = 0.34, $p = 0.03$. $R^2 = 0.05$ F (1, 93) = 4.61, $p = 0.03$; Table 6].

The normal distribution hypothesis of the residuals was analysed, which is an important factor for the validity of the tests. The test showed that the normal distribution hypothesis seemed to be valid in this case.

TABLE 4 Regression analysis summary for neuroticism predicting person–organisation fit.

Variable	B	ß	t	p	R^2	Adjusted R^2	F Statistic
Overall model					0.07	0.06	7.77 (df = 1;93)
(Constant)	4.77		16.28	$p < 0.01$			
Neuroticism	−0.32	−0.27	−2.78	0.006			

TABLE 5 Regression analysis summary for agreeableness predicting holacracy satisfaction.

Variable	B	ß	t	p	R^2	Adjusted R^2	F Statistic
Overall model					0.05	0.04	4.61 (df = 1;93)
(Constant)	2.12		2.82	$p < 0.01$			
Neuroticism	0.35	0.21	2.14	0.034			

TABLE 6 Regression analysis summary for agreeableness predicting person-organization fit.

Variable	B	ß	t	p	R^2	Adjusted R^2	F Statistic
Overall model					0.04	0.03	3.58 (df = 1;93)
(Constant)	2.83		4.79	$p < 0.01$			
Neuroticism	0.24	0.19	1.89	0.061			

4. Discussion

Holacracy denotes a modern form of organisational governance. The first part of this study focused on differences in work conditions between holacratic and traditional organisations. The goal was to understand better these new forms of organising companies by comparing important work conditions. The second part of the study focused on different personality traits as predictors for person–organisation fit and satisfaction with holacracy. The objective was to identify relevant personality traits that predict satisfaction and individual fit with holacracy.

The goal of hypotheses 1 and 2 was to determine whether there are systematic differences in illegitimate tasks and appreciation between holacratic and non-holacratic companies. For this study, the task stressor illegitimate tasks and resource appreciation were used. Illegitimate tasks are those that an employee evaluates as either unnecessary or unreasonable, i.e., they feel that the task assigned does not fit their role (Semmer et al., 2015).

The first hypothesis assumed that employees working in holacratic companies would experience fewer illegitimate tasks on average than employees working in traditional companies because employees can determine their own tasks due to the lack of hierarchies and dynamic processes. A significant difference was found, with employees in holacratic companies having fewer illegitimate tasks on average than employees in non-holacratic companies. These results were expected and confirmed the assumption that employees in holacratic companies rarely complete tasks that do not fit their role due to their high level of personal responsibility. This finding is very interesting, as studies have shown that if employees must perform illegitimate tasks too often, this can lead to stress, dissatisfaction and, in the worst case, termination (Semmer et al., 2015). Companies should therefore ensure that employees can either choose their tasks independently or that their supervisors know properly the role profiles of their employees, assign them tasks that fit their role and explain when illegitimate tasks are unavoidable. In addition to that, companies should ensure that supervisors understand the roles of their employees and, consequently, reduce illegitimate tasks (Semmer et al., 2010). Another explanation for why employees in holacratic companies experience fewer illegitimate tasks could result from a study from Björk et al. (2013). They showed that the more the organisation was characterised by competition for resources between units, unfair and arbitrary resource allocation and an obscure decisional structure, the higher the illegitimate tasks score of the participants was. With holacracy, power is distributed throughout a concrete organisational structure, giving individuals and teams freedom while staying aligned with the organisation's purposes. The organisation in circles could lead to an equal and fair distribution of resources, and decision-making processes should be made transparent (Robertson, 2015).

The second hypothesis examined whether employees in holacratic companies experienced higher appreciation than employees in traditional companies. The results showed that there was a significant difference between the two groups, with the holacratic group showing higher average values on the appreciation scale. This confirms the second hypothesis. One explanation for this could be that good cooperation and respectful interaction between colleagues in holacratic companies has a high priority and that the lack of hierarchy tends to create a sense of community. Everyone contributes to the success of the company and does their best to support their team. In addition to lower illegitimate tasks that function as stressors, there is also a higher level of appreciation that functions as a resource. Appreciation was shown to buffer the link between illegitimate tasks and well-being (Stocker et al., 2010). Supervisors often assign illegitimate tasks and are criticised for expressing sparse appreciation to followers (Kottwitz et al., 2019). Future studies should locate the sources of illegitimate tasks and appreciation in holacracy because there are fewer or no supervisors (Robertson, 2007). The results of the first and second hypotheses indicate that in holacarcy companies, working conditions are to the advantage of employees. Higher perceived appreciation and less illegitimate tasks could therefore have a positive impact on employees' performance and thereby on the economic success of the company. This is assumption is supported by a just recently published study, that analyzed the performance of democratically structured enterprises and found out that out of 83 investigated enterprises 50 showed no signs of degeneration or even degeneration tendencies (Unterrainer et al., 2022). Better working conditions and thereby a better performance of the employees may be a potential explanation for this. The fact that the working conditions in holocratical companies seem to be better than in traditional companies is also interesting, because in the past the attempt to hand over power to the employees has already failed. The former Yugoslavia can be mentioned here as an example. Here, the introduction of self-management had rather negative effects, as there was a clash of interests between the organisation and the employees and, in some cases, exploitation of the employees (Koyama, 2013).

The third hypothesis investigated whether extraversion is a predictor for person–organisation fit. This assumption was made because holacracy requires all employees to interact a lot with other colleagues and to defend their positions, for example when denying a certain task due to a lack of existing hierarchies. Employees who show a typical personality trait for high extraversion should feel more comfortable in such an environment and experience a higher fit. The results, however, did not confirm this hypothesis, as no correlation between extraversion and person–organisation fit was found. The results, therefore, do not align with hypothesis three. One explanation is that only working in a holacratic company does not necessarily mean that self-confidence is required, and hence extraversion has no impact on the person–organisation fit. It is probable that employees who have roles mainly consisting of tasks that do not require exchanges with colleagues and whose roles are clear, such as programming, do not need to have high values for extraversion. This means that even with low extraversion employees can still experience high person–organisation fit.

Moreover, the results of a meta-analysis that investigated differences between managers and entrepreneurs using the Five Factor Model showed that results regarding extraversion across the studies were characterised by variability. Zhao and Seibert (2006) found relevant differences for all dimensions except extraversion, as the CI was too wide, and the CRI indicated mixed results across the studies that were part of the meta-analysis. The role of extraversion in a holacratic environment remains open for the time being.

The fourth hypothesis investigated the role of neuroticism regarding person–organisation fit. Neuroticism emerged as the strongest correlation for person–organisation fit. Moreover, the results of the linear regression confirmed the assumption that neuroticism is also a significant predictor for person–organisation fit. The results were expected and are aligned with other studies that investigated the role of neuroticism in the work context: in their meta-analytic review, Judge et al. (2002) investigated the role of the Big Five and job satisfaction. They also found neuroticism to be the strongest correlate for job satisfaction. These results can be explained by the fact that people who show higher values for this dimension are likely to experience more negative life events, including at work. This will again influence their satisfaction and their experienced fit. In addition, high values for neuroticism mean that someone is often anxious and hostile. Working in a company where everything is about teamwork and interaction is thus not a good fit for such a person.

Whether openness to experience correlates with the experienced fit was the goal of the fourth hypothesis. The results did not show any relationship between those two variables and thus contradict the assumption of the hypothesis. The positive relationship was expected because people who have high values for this dimension typically are creative and prefer political liberalism. Due to the lack of hierarchy, holacracy allows employees to fully use their creativity and develop their own ideas. Moreover, the approach is closely related to political liberalism, so people who believe in this political approach were expected to experience a high person–organisation fit. A possible explanation for the result could be that when working with holacracy, the practice is not as creative and liberal as expected. It should be kept in mind that there are still many rules that must be followed, and through some special roles like the "lead-link" or "the rep-link," a certain kind of hierarchy still exists. Also, through the constitution, the general procedure is strictly organised and could prevent creativity and the feeling of liberalism for some employees. Apart from that, there are still positions for which no creativity is needed.

The sixth hypothesis investigated the correlation between conscientiousness and person–organisation fit. No significant relationship was found. The results were not expected and are not in line with the hypothesis. In holacratic companies, self-organisation is expected to play one of the most important roles, as it enables a person to handle better the loose structures and high level of responsibility. If someone has high values for this personality dimension, they may handle holacracy better and feel that the company matches their own competences. But, again, this was not the case for this study. The results indicate that self-organisation is not a necessary skill for an employee who is working in a holacratic company. A possible explanation for this result is that holacracy still involves many requirements, such as a high number of meetings, despite the lack of hierarchies (Bernstein et al., 2016). This means that a high level of self-organisation is not necessarily a prerequisite for holacracy, and employees will not necessarily struggle if they have poor organisational skills. This contradicts the statement of Van De Kamp (2014), who assumed that self-organisation is important to deal with holacracy.

One of the five dimensions—agreeableness—was of particular interest in this study. This dimension could play a meaningful role in holacratic companies. A study by Seibert and Kraimer (2001) found that people with high scores for this dimension tend to earn less and are more likely to be less satisfied with their careers than people with low scores. This can be explained by the fact that people with high scores on this scale need harmony and are more committed to others than to themselves. In traditional companies, this behaviour would probably do them more harm than good in the long term. In holacratic companies, it is not about the individual career because without titles and hierarchies, the career in the company plays a subordinate role. Rather, teamwork and mutual consideration are more relevant and lead to recognition and respect. Selfishness or selfish behavior is likely to be given much less space than in more traditional approaches. As previously described, Templer (2012) found in his study that agreeableness also plays a different role in Eastern than in Western European cultures. The same principle applies: if a person wants to pursue a career in Europe or the United States, they should not pay too much attention to their colleagues to gain recognition. The same behaviour would not lead to recognition in Asian cultures; in contrast, the common good comes first. Someone who puts community first will find recognition and respect.

Hypotheses 7a and 7b analysed the relationships between agreeableness and person–organisation fit and between satisfaction and holacracy. Hypothesis 7a focused on agreeableness and person–organisation fit. The results showed a significant positive correlation between these two variables and are aligned with the hypothesis. The linear regression showed a marginally significant result, as the value of p was 0.01 above the suggested 0.05 value. There is a lot of criticism of this rigid limit (Amrhein et al., 2017).

Hypothesis 7b investigated the relationship between agreeableness and satisfaction with holacracy. The results confirmed the findings from hypothesis 7a, as they also showed a positive, significant relationship between the two variables. The results of the linear regression confirmed the assumption that agreeableness is also a significant predictor for satisfaction. However, the explained variance was rather small.

These results are in line with those from a study from Templer (2012), which investigated whether agreeableness plays a more important role in job satisfaction in collectivist societies compared with individualist societies. The results suggested that in collectivist societies, agreeableness plays a prominent role in the explanation of job satisfaction. Templer (2012) assumed that in collectivistic societies agreeable individuals are rewarded for having harmonious relationships at work and not being involved in conflicts. In individualistic societies, a low level of tolerance is a sign of strength and can lead to a fight for a higher position, which leads to reassurance and rewards. Companies that work with holacracy may be more like a collectivist society, because in both contexts making good impressions and displaying prosocial behaviors to in-group members is very important. Being agreeable and helpful is therefore an important prerequisite. In contrast to that, individuals living in western societies and working in traditional hierarchical structures might also be rewarded and get ahead of others for being disagreeable and entering into conflict with others if they are perceived as performers by their superiors (Templer, 2012). In addition, employees might feel that the structures within holacracy fit their personality well, resulting in a high value for the person–organisation fit scale. These results indicate that agreeableness could be a beneficial personality trait for employees working in holacratic companies to experience a high person–organisation fit.

4.1. Theoretical implications

This study raises the question of the extent to which findings from earlier studies, where traditional hierarchies were still normal, can be applied to new concepts such as holacracy. When the CEO of Zappos announced that they would switch to holacracy, he emphasised that all employees could now behave like entrepreneurs. The entrepreneurship literature states that entrepreneurs are often characterised by high values for conscientiousness and openness, and low values for agreeableness and neuroticism (Zhao and Seibert, 2006). This contrasts with the results of this study, which associated high values on the compatibility scale with a high level of person–organisation fit. The feasibility of the Big Five in different contexts should be considered when determining the design of future studies. Some studies highlight the relevance of cultural context (Triandis and Suh, 2002; Templer, 2012). The results of the present study indicate that even if the cultural context remains the same, other circumstances related to a new form of company organisation can change the impact of the Big Five.

In addition, the relevance of illegitimate tasks and appreciation becomes clear. The two constructs seem closely linked and play a particular and important role, especially for the younger generations, Y and Z. Studies have found that the relevance of hard factors such as salary and career opportunities decrease, and factors such as the implementation and recognition of own ideas and appreciation become more important (Deutschland, 2015). The question arises as to whether appreciation from superiors or colleagues is more important. A study from 2015 found that the appreciation of colleagues is particularly important for Generation Z. This may explain why appreciation values in holacratic companies are higher than in traditional ones. Researchers should consequently consider that when general appreciation is examined, who the appreciation is coming from is clearly defined. In addition, researchers should try to find out which circumstances and criteria lead to employees in holacratic companies feeling more valued and less likely to carry out illegitimate tasks since both constructs have an enormous influence on employee satisfaction and on the success of the company (Semmer et al., 2010, 2015; Eatough et al., 2016; Kottwitz et al., 2019).

4.2. Practical implications

Based on the results of this study, human resources managers should conduct personality tests that investigate the Big Five because results suggest that agreeableness and neuroticism predict person–organisation fit, which influences job satisfaction and the intention to quit (Kristof-Brown et al., 2005). Other personality traits, such as extraversion, openness to experience or conscientiousness showed no correlation with person–organisation fit, which means that they probably do not play a general role in employee satisfaction with holacracy.

Interesting results from this study emerged from hypotheses 7a and 7b, which highlight the relevance of the variable agreeableness in the context of holacracy. Human resources managers should therefore watch for applicants who do not show a behaviour that indicates a high potential for conflict readiness. Moreover, neuroticism also significantly correlated negatively with the dependent variable person-organisation fit.

In addition, when comparing holacratic and traditional companies, it was shown that employees in a holacratic organisation rarely must do illegitimate tasks and generally feel more valued at their workplace than employees in traditional companies. These results suggest that approaches like holacracy are not getting a lot of attention without reason. Self-organisation, instead of strict guidelines and strict hierarchies, seems to meet the needs of the younger generations (Lang and Scherber, 2018). Traditional companies should therefore question their existing structures and change their processes in such a way that employees can choose their roles by themselves. In addition, flat hierarchies seem to lead to colleagues treating each other with attention and respect despite a lack of appreciation from superiors. Companies should therefore take care to create an atmosphere and a culture in which colleagues respect and value one another. This result fits with the goal of holacracy: to create a sense of community, which leads to high productivity and agility in order to offer successful products and services.

4.3. Limitations and future research

The following limitations must be considered. First, a main limitation was the cross-sectional data. Changes in the perceived person–organisation fit may occur over time and differ from day to day. So, future studies should include more than one measurement point. Second, the participants were mainly recruited *via* LinkedIn, meaning that people without a LinkedIn account were excluded from participation. In their study from 2014, McPeake et al. (2014) argued that one disadvantage of online surveys is that it is not suitable for everyone in the same way and thereby excludes participants, a bias which is also known as selection bias. In addition, the findings can only be applied to Germany, Austria and Switzerland. It should also be noted that employees are often requested to participate in online surveys, especially when working in a company that uses a highly modern approach. This assumption is supported by experiences from this study, as many participants refused to participate with the explanation that they were too often invited to do so. Future studies might then seek to invite participants to a laboratory and offer compensation to increase their motivation. Future studies should also note how long an employee has already worked with holacracy, as valid results may not be produced over a short period. In addition, researchers should further address which factors explain some people being satisfied with holacracy and having a high person–organisation fit as compared with others. Out of five dimensions, only two showed correlations with the dependent variables. It is of great interest to determine which other factors predict person–organisation fit.

For example, more specific personality traits, such as perseverance, creativity and adaptability, are believed to be predictors for entrepreneurship (Fueglistaller et al., 2019) and could therefore influence the perceived person-organisation fit. In addition, external factors, such as the practical implementation of holacracy, should be examined as influencing factors for employee satisfaction. For example, a start-up called Blinkist reports that they are using a slightly modified form of holacracy (Klein, 2015). This might lead to a bias in the results. As mentioned above, the results indicate that even if the cultural context remains the same, other circumstances related to a new form of company organisation can change the impact of the Big Five. Therefore, future studies should carefully consider the context in which the study is being conducted.

As a last limitation, it should be mentioned that the results of hypotheses 1 and 2, which examined the differences between holacratic and traditional companies, could be explained by more room to manoeuver. However, holacracy is still partly structured by the constitution and other further rules. Future studies should include room to maneuver as a control variable.

5. Conclusion

The results of this study indicate that working conditions systematically differ between holacratic and traditional companies. Employees in holacratic companies experienced higher appreciation and less illegitimate tasks than workers in traditional organisations.

Moreover, an interesting finding is that high agreeableness showed significant results for all of the two dependent variables. The reason for this might be that companies that use holacracy foreground a feeling of community instead of individual well-being. As low agreeableness might otherwise lead to high person–organisation fit in individualistic societies, the holacratic approach is potentially similar to work environments in collectivist societies. The role that extraversion, openness to experience and conscientiousness were expected to play regarding their correlation with person–organisation fit were not confirmed and should be investigated in more detail in further studies.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by Ethics Committee of the University of Bern, Switzerland (Ethics no. 2019-01-00005). The patients/participants provided their written informed consent to participate in this study.

Author contributions

LW, SG, and AE designed the study. AE structured the ideas. LW did the analyses. All authors contributed to the article and approved the submitted version.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Perceived organizational support and organizational citizenship behavior–A study of the moderating effect of volunteer participation motivation, and cross-level effect of transformational leadership and organizational climate

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The purpose of this study is to examine the relationship between perceived organizational support and organizational citizenship behavior, and to explore the moderating effect of volunteer participation motivation on the relationship between the variables, as well as the cross-level effect of transformational leadership and organizational climate. In this study, the front-liners of Taiwan's National Immigration Agency were the study subjects. A total of 289 employee questionnaires were filled out and returned. It was found that employees' POS had a positive effect on OCB, while volunteer participation motivation had a moderating effect on the relationships between the variables. Furthermore, transformational leadership and organizational climate were found to have a cross-level effect on enhancing employees' POS, boosting their motivation to volunteer, and triggering more OCB in employees. The results of this study provide the organization with development measures to encourage its employees to convey more OCB, and improve their service performance. Moreover, based on research evidence that an organization encourages employees to actively participate in voluntary work, and should promote cooperation between the employees and the public by enhancing their sense of public responsibility, improving their services to the public, creating a harmonious work climate for the employees, and offering more opportunities for the public to engage with the employees.

KEYWORDS

perceived organizational support, volunteer participation motivation, organizational citizenship behavior, transformational leadership, organizational climate

1. Introduction

The old-fashioned bureaucratic model takes the perspective of administrative convenience in public service provision, whereas the customer-oriented service model emphasizes that organizations should focus on customers and provide services or products that meet the needs of customers (Koehler and Pankowski, 1996). The implication of social exchange theory (social exchange theory) shows that perceived organizational support (POS) can promote organizational citizenship behavior (OCB) of employees (Abdullah and Wider, 2022). Despite being difficult to normalize OCB in a formal organizational management system, OCB can be indirectly promoted or controlled by a non-formal approach. One can also use positive environmental conditions to reinforce employees' OCB (Kao, 2017). Therefore, regarding Taiwan's National Immigration Agency, the organization may be able to trigger employees' OCB through POS or altruistic motivation.

Although studies have shown that POS could elicit more OCB in employees, the degree of employees' POS is not positively associated with the OCB frequency. For example, Thompson et al.'s (2020) study found that even if women do not have higher perceived organizational support, they feel more obliged to engage in extra-role behaviors than men. In addition, the level of individual-organization fit (Jehanzeb, 2020) and the violations of psychological contract will also affect employees' OCB performance (Shaheen et al., 2016; Wang et al., 2023). Consequently, a high level of POS does not necessarily trigger more OCB; the association between POS and OCB is affected by many factors, including personal behavior. To encourage employees to autonomously meet extra-role requirements and contributions to help the organization achieve its goal, it is important to determine if there are other reinforcements beyond the POS. According to the altruistic component of OCB, this study suggests that in addition to improving POS, organizations can increase employee OCB by increasing their motivation to volunteer.

Parker and Axtell (2001) suggested that the association between POS and OCB can be strengthened through perspective taking. Perspective taking refers to an individual's attempt to understand the thoughts, motivations, and behaviors of others without subjective bias (Calvard et al., 2023). The concept here is that individuals will learn others' ideas and thoughts through social activities that alter their prejudice and helps them accept or consider others' perspectives. The decision-maker, as a consequence, will be able to consider and comprehend the performance indicators as well as the values and needs (Ng et al., 2022). Individuals with perspective taking are more likely to understand and accept the views of others, thereby stimulating personal altruistic motivation, and showing high OCB through voluntary service (Da'as, 2020). Base on this, POS can positively affect employees' OCB performance through the interaction with volunteer participation motivation. It is believed that the above theory can be applied to the volunteering process of the frontliners of the National Immigration Agency, especially those who frequently interact with travelers entering or leaving Taiwan or those who counsel new immigrants. This is because by asking questions, listening carefully to others, and observing the behavior of others, employees will be able to pay more attention to the ideas and needs of others or accept the views of others. This change will enable frontliners to assist the public more effectively and efficiently, offer better public services, and improve the image of the government of Taiwan among domestic and foreign travelers. Furthermore, because employees' positive motivation and perspective taking are a type of altruistic behavior of concern for others, more employee OCB will be triggered (Sabati, 2022). Although volunteer participation motivation is not entirely altruistic, the result may benefit other individuals (Stillman and Tonin, 2022).

Taken together, it is critical to enhance employees' POS and trigger their volunteer participation motivation. Although both POS and volunteer participation motivation are related to employees' personal perception and motivation, there are several ways for organizations to elicit their employees' OCB. In fact, organizations may be able to influence their employees' extra-role *via* multiple factors. For example, a manager can encourage his or her team members to accomplish a common goal of the organization by adopting the right leadership style. In fact, a manager's leadership style has a decisive effect on how employees behave (Shofiyuddin et al., 2021). Studies have shown that by enhancing group identification and cohesion, an organization's leader can trigger employees' OCB by creating a positive organizational climate (Kao, 2017; Liao et al., 2022). Organizations can also use various formal and informal systems to create a good atmosphere and shape employees' positive thinking and motivation for more OCB (Schmidthuber and Hilgers, 2019).

An organization can trigger employees' OCB by enabling employees to perceive their contributions and welfare as valued by their organization and by providing various incentives. At the same time, the organization can work on employees' volunteer participation motivation to use their desires to care for others in order to elicit more OCB. Moreover, transformational leadership and organizational climate not only encourage altruistic behavior but also reinforce employees' POS and increase their volunteer participation motivation, and consequently, more OCB can be triggered. Although the above viewpoints have been confirmed by various studies (Astuty and Udin, 2020; Shofiyuddin et al., 2021), possible reinforcers for the relationship between POS and OCB have rarely been explored. This study considered employees' motivation to volunteer an important factor catalyzing the relationship between POS and OCB, and for most volunteers, feedback mechanisms and altruistic motivations are the primary factors of volunteer participation motivation. Although various factors motivate people to volunteer, most researchers agree that caring for other people, which is an altruistic behavior, is one of these factors (e.g., Pan et al., 2022; Pfattheicher et al., 2022). For example, since 2012, the Taiwan Immigration agency has promoted the voluntary grouping of employees, using holidays to combine volunteer workers in the community to visit the homes of foreign immigrants in need of assistance, such as those living alone or those with limited mobility, to visit and provide necessary assistance. Such as assisting in medical treatment or helping to clean the home environment to encourage altruistic behavior of immigration officers and enhance the image of the organization. Such activities are called "going to the countryside service activities." Based on the aforementioned, the association between POS and OCB can be reinforced by encouraging people to volunteer. Furthermore, this study has included organizational factors, i.e., transformational leadership and organizational climate, in exploring ways to encourage employees' OCB.

According to the 2020 statistics database of the Tourism Bureau of Taiwan's Ministry of Transportation (Tourism Bureau, Republic of China (Taiwan), 2020), before the COVID-19 outbreak, there were approximately 11.84 million tourists came to Taiwan in 2019, a record high and an increase of 7% from 11.07 million in 2018. According to the WTTC (2018) survey on Taiwan's tourism employment environment, Taiwan's tourism industry, including related industries, provided 264,000 job opportunities in 2017, accounting for 2.3% of the employment. Therefore, the number of employees in the industry or related industries has created a considerable proportion of Taiwan's employment population, and its overall tourism output value accounts for about 2.47% of Taiwan's GDP, which shows the importance of the tourism industry to Taiwan (WTTC, 2019). Although COVID-19 has caused a huge proportion of job losses to the global tourism industry, the epidemic is gradually fading and borders are being lifted. Under such circumstance, Taiwan not only needs to catch up quickly in the human resources of the tourism industry, but also the quality of human resources related to border control needs to be improved. Human resources are the core factor of organizational performance. Therefore, by exploring the topics of this research, it is especially important for Taiwan's National Immigration Agency, which provides services to travelers entering or leaving Taiwan, new immigrants, and foreign workers. Because most existing OCB studies are focused on the antecedents or results of OCB, it is important to jointly explore the moderating effect of volunteer participation motivation and organizational factors. This can make up for the gap of existing research on how organizations can strengthen employees' volunteer participation motivation, that is, encourage employees to "*perspective taking*" to enhance the relationship between organizational support and OCB.

Considering the level of analysis, because the transformational leadership of managers and organizational climate are organizational factors, they are group-level constructs. As a result, their effect on employees' attitude or behavior should be analyzed and explored from a cross-level perspective. Therefore, this study views transformational leadership as a group-level variable. Besides evaluating individual-level variables, it is also critical to address the overall effect of a leader's behavior on the group. Organizational climate was considered as an organization-level variable in this study. Employees' perception about an organization's climate can be pluralistic, and different behaviors are elicited in employees (Kao, 2017). Taken together, in this study, the frontliners of Taiwan's National Immigration Agency were the study subjects, POS was the antecedent variable, volunteer participation motivation was the moderating variable, and OCB was the dependent variable. The objective of this study was to examine the relationship among the three variables above as well as the moderating effect of volunteer participation motivation. The cross-level effect of group variables, i.e., leadership style and organizational climate, on individual-level variables was also explored. In other words, we take this multi-level analytical approach to address knowledge gaps about the factors that affect the relationship between POS and OCB.

2. Conceptual framework

2.1. Concepts

An organization's employees would have an overall perception of the organization based on whether their contributions and welfare are valued by the organization, which is perceived organizational support (Kurtessis et al., 2017). It can be defined as the belief that employees develop in their minds to assess how much the organization values their contributions and welfare. The social exchange theory suggests that employees who perceive that their contributions and welfare are valued by their organization (i.e., POS) will feel obligated to assist their organization in attaining its goal (Eisenberger et al., 1986), and because of this sense of obligation, these employees will exhibit not only in-role behavior but also extra-role behavior, such as OCB (Abdullah and Wider, 2022). Studies on volunteer participation motivation emerged in 2000, Wang (2001) proposed an idea of volunteers' various motivations based on Clary and Snyder (1991) and Lucas and Williams (2000). These motivations include altruistic values, personal development, community concerns, ego enhancement, and social adjustment. Employee volunteer motivation can be defined as the motivation of employees to voluntarily participate in activities or affairs outside the organization, which is mainly based on social orientation and personal growth needs (Hurtz and Williams, 2009). Kim et al. (2015) pointed out that volunteer participation motivation originated from unsatisfied needs can be physiological or a drive. Overall, volunteer participation motivation is part of social motivation and has an altruistic nature (Han et al., 2020). As a result, volunteers are motivated to volunteer to care for other people. In addition, OCB is defined as an employee's voluntary behavior, which is not restricted by the work contract and can effectively promote the performance of the organization (Bakhshi et al., 2011). OCB is an unconditional work behavior of employees (Cho and Kao, 2022). Although this type of behavior is not explicitly regulated in job descriptions, it is accepted by the organization (Qiu and Dooley, 2022). More importantly, OCB is a voluntary behavior of employees (Rizaie et al., 2023). Internally, OCB allows organizations to operate more effectively, thereby enhancing organizational performance (Williams and Polito, 2022). Externally, OCB improves service quality and customer satisfaction (Wang and Xiao, 2022). According to Azizaha et al. (2020) and Desky et al. (2020), OCB is a profound contribution that is beyond what is required by one's job at the workplace and is rewarded by the organization based on the performed tasks. Vizano et al. (2020) revealed that employees' OCB willingness is related to social exchange, and this theory is based on the hypothesis that there is a mutual and fair relationship between an organization and its employees. When employees have a positive perception of their organization, they will repay the organization practically and effectively, and OCB is the way that employees repay their organization (Shofiyuddin et al., 2021). OCB is a multidimensional behavior that is interpreted differently by researchers. Nevertheless, OCB overall is an interpersonal behavior beneficial to society, an explicit public welfare- and civic virtue-oriented behavior, and an in-role behavior about properly performing one's duty (Kao, 2017). Since OCB is so important, organizations should understand what drives employees to exhibit more OCB. Studies have pointed out that the factors related to OCB include situational variables such as organizational justice, leadership support (Pletzer et al., 2021), and organizational climate (Kao, 2017). Job-related attitudes might include job satisfaction or organizational commitment (Shahjehan et al., 2019), individual differences, such as gender (Ng et al., 2016), cognitive ability (Miao et al., 2018), or caring altruistic behavior characteristics (Cho and Kao, 2022). For example, Thompson et al. (2020) revealed that women are more likely to feel obligated to show more extra-role behavior for the organization even when they perceive less organizational support. In addition, the relationship between POS and OCB can be either reinforced through factors such as person-organization fit (Jehanzeb, 2020) and psychological capital (Shaheen et al., 2016) or weakened by factors such as psychological contract breach (Islam et al., 2017). Interactions of these different classes of correlates are frequently used to predict employees' OCB (Newman et al., 2017). Based on this, both organizational and personal factors are sufficient to influence the performance of employee OCB.

Transformational leadership can be defined as a process of organizational change that can combine the common needs and desires of organizational members. A leadership style based on members' consensus on organizational commitment, where leaders create favorable conditions for personnel beliefs and behavior change (Benefiel et al., 2014). Studies have shown that a transformational leader encourages his/her subordinates to adopt a new perspective (e.g., intellectual stimulation) for problem solving. Moreover, a transformational leader should provide support and encouragement (e.g., individualized consideration), spreads a vision (e.g., inspirational motivation) and elicits both affection and identification (e.g., charisma) (Gabriel et al., 2022). Like a mentor or a coach, a transformational leader listens attentively to his or her subordinates, cares for each employee individually, and pays attention to the achievement and the improvement of subordinates. Furthermore, a transformational leader encourages subordinates to take more responsibility, thereby helping them reach their full potential (Chebon et al., 2019; Bin Bakr and Alfayez, 2021). A distinctive characteristic of transformational leaders is that they share a group interest-oriented vision with the people around them (Fareed and Su, 2022). In addition, a transformational leader tends to create a committed work climate. They empower their followers and provide them with enough support for innovation at work (Astuty and Udin, 2020). Based on this, transformational leadership increases employees' OCB by boosting their POS and triggering their volunteer participation motivation (Dinc et al., 2022; Du and Yan, 2022; Guarana and Avolio, 2022). As for the climate, it is a way for people to learn about their work environment. It represents the perception model or theme experienced by employees. It is also about organization members conceptualizing all their workplace related experiences (Hsieh and Kao, 2022; Sawyer, 2022; Shenk and Gutowski, 2022). Litwin and Stringer (1974) defined organizational climate as an assessable work environmental feature, and it is an individual's direct or indirect perception about his or her life and work in the work environment. Therefore, this study confirms that organizational climate can be defined as "the employee's awareness of some events, activities and procedures in a certain environment, as well as those behaviors that may be rewarded, supported, and expected," that is, it can be described as the shared cognition of members of the same organization. Organizational climate is assumed to affect employees' motivation and behavior (Kataria et al., 2022). This is because organizational climate affects how an individual perceives his or her daily business in the organization (Kao, 2017). Moreover, through engagement and experience, employees' behavior is affected by the internal environment of their organization (Hoang, 2022). As a result, a positive organizational climate not only encourages job performance and a positive organization-employee relationship, but also improves employee job satisfaction that is capable of triggering employees' volunteer participation motivation (Gheitani et al., 2018; Saks, 2022). Group cohesion and socialization experiences formed by organizational climate can affect employees' willingness to increase their extra-role behavior (Schmidthuber and Hilgers, 2019), such as doing more volunteer work or engaging themselves more in civic activities good for their organization (Soelton et al., 2020).

In summary, POS can promote employees' OCB display, and organizations can encourage employees to display more OCB by encouraging employees to participate in volunteer activities. At the same time, through the leadership style of the supervisor and the establishment of a good organizational climate, the organization can strengthen the POS of employees and the participation motivation of volunteers, so to induce them to show civic behavior that is beneficial to the organization.

2.2. Hypothesis development

2.2.1. Relationship between perceived organizational support and organizational citizenship behavior

Hayat Bhatti et al. (2019) believed that in the foundation of trust, employees have the willingness to demonstrate OCB because they believe that the organization or managers will have peer feedback after their efforts. The Qi et al.'s (2019) study pointed out that based on the exchange norm of reciprocity, when employees perceive organizational support, they develop a sense of obligation to help the organization achieve its goals. Because from the perspective of social exchange theory, when employees feel the help of the organization, they will give back to the organization with harder hard work and loyalty, or help employees in difficulty. Perceived organizational support comes from how employees attribute and judge how the organization treats them (Silva et al., 2022). Therefore, when members who join an organization feel considered as part of the organization and are highly valued, employees will feel that they have a responsibility to contribute adequately to the organization to provide the best performance for the organization (Kristiani et al., 2019).

Based on the above, studies have shown that based on the reciprocal norm, employees who perceive support from their organization tend to feel obligated to help their organization achieve its goal (Thompson et al., 2020). According to the social exchange theory, employees who perceive organizational support will work harder and be more loyal to the organization in return (Imran et al., 2020). Therefore, the employees of an organization who perceive themselves as being treated as members of their organization and valued by their organization will consider themselves responsible for making as many contributions as possible to their organization; so the organization can perform its best (Ridwan et al., 2020). In additional, the psychological mechanism of employees' perception of their organization's loyalty (commitment) is related to the concept of social exchange and a psychological contract between employees and their organization (Garcia et al., 2021). POS is capable of affecting employees' work attitude and behavior through the effort-anticipated reward association and the reinforcement of personal social emotional need (Shabbir et al., 2021). Consequently, organizations can use employees' POS to boost their OCB. Moreover, according to the social exchange theory and the reciprocal norm, employees develop a general belief assessing the extent to which their organization values their contributions and wellbeing. Employees perceiving a trustworthy relationship with their organization are likely to demonstrate OCB (Kurtessis et al., 2017; Aboramadan et al., 2022).

According to the above ideas, this study proposed the first hypothesis:

> **H1: Perceived organizational support has a positive effect on organizational citizenship behavior.**

2.2.2. Volunteer participation motivation has a moderating effect on the relationship between POS and OCB

Han et al. (2019) suggested that by offering incentives, organizations can elicit employees' OCB. Therefore, when an organization cares about its employees' wellbeing, values their contributions, and provides favorable work conditions, its employees will perceive organizational support and appreciate the organization. These employees will also show a strong sense of obligation, which prompts them to exhibit OCB in return (Thompson et al., 2020). Parker and Axtell (2001) proposed the perspective taking theory and suggested that the effect of taking the perspective of other people would change an employee's original traits and dispositions, and the magnitude of the change depends upon the person's motivation (Škerlavaj et al., 2018). Within an individual's scope of work, the social motivation of volunteering directly benefits other people while improving one's work performance and the drive to succeed, and therefore, it is OCB-related (Robison, 2022). Moreover, people with perspective taking can put themselves in others' position to understand and feel the thoughts and ideas of others, so as to form a motivation to help others and promote them to show more altruistic behaviors, such as OCB (Sabati, 2022). Therefore, in the influence of POS on OCB, if the voluntary service with altruistic motives of volunteers can be used as perspective taking, the organization's support for them can be better understood, which will eventually increase OCB (Kim et al., 2019). Furthermore, studies have shown that employees showing a stronger volunteer participation motivation are likely to be more engaged at work and more satisfied with their work (Dal Corso et al., 2019). In terms of engagement motivations, the key motivations are interpersonal interaction, serving others, knowledge acquisition, and keeping in touch with society (Arai, 2000). Researchers have discovered that volunteering is an engagement behavior based on social responsibility; it is a virtue of helping other people and an organizational altruistic behavior (Ficapal-Cusí et al., 2020).

Taken together, employees who perceive themselves as well-treated by their organization will in return demonstrate citizenship behavior beneficial to their organization. This mentality of reciprocation or exchange will affect employees' attitude toward their organization and reflect on their work attitude or behavior. Therefore, POS and volunteer participation motivation will affect OCB *via* different social exchange routes, and employees' volunteer activities have a positive catalytic effect on the relationship between POS and OCB. In other words, POS can positively affect employees' OCB performance through the interaction with volunteer participation motivation.

According to the ideas above, the second hypothesis was proposed as follows:

> **H2: Volunteer participation motivation has a moderating effect on the relationship between POS and OCB.**

2.2.3. Relationship between transformational leadership and organizational climate

The leader of an organization plays a key role in affecting the work environment and employees' perception of work (Pancasila et al., 2020). Avolio et al. (1999) pointed out that transformational leaders would apply their influence to integrate leader-subordinate interactions. At the same time, they would offer personalized care, stimulate employees intellectually, and establish an interactive and creative process between leaders and their followers through motivation and spiritual inspiration. By doing so, they would encourage employees, win their admiration, respect and honesty, and aggregate the power from their followers, which together will promote group cohesion (Jiang and Chen, 2018). Some studies have shown that transformational leaders with a good leadership style can boost employees' confidence in other team members, and employees will believe that their team members will offer help when they are in need. This will therefore improve team cohesiveness (Asgari et al., 2020). According to the above findings, transformational leadership cultivates group identification and cohesion, links team members together, and consequently affects organizational climate (Mach et al., 2022).

As a result, the third hypothesis was proposed:

> **H3: Transformational leadership has a positive effect on organizational climate.**

2.2.4. The cross-level effect of transformational leadership on POS and volunteer participation motivation

Research has shown that transformational leaders can inspire those around them to emphasize a vision of group interests (Veríssimo and Lacerda, 2015), create a committed work climate, empower their followers, and provide sufficient support to achieve innovation at work (Astuty and Udin, 2020). In addition, a leader with a transformational leadership style tends to motivate his/her subordinates to exceed their expected output by changing their vision, being role models, providing support and inspiring their desire to change for the better (Suifan et al., 2018). Furthermore, a study has shown that transformational leadership encourages people to value a common interest-based vision (Guarana and Avolio, 2022). It also creates a work climate for organizational identification, supports and encourages subordinates, and spreads the organization's vision thereby making employees feel emotionally connected to the organization and identify themselves with the organization (Dinc et al., 2022; Du and Yan, 2022). At the same time, employees are encouraged to bear more responsibility for the development of positive motivation and altruistic behavior (Astuty and Udin, 2020). Based on the previous mentions, transformational leadership styles will have a great impact on how subordinates act (Shofiyuddin et al., 2021), such as improving POS and showing more OCB (Bacha and Kosa, 2022).

Managers and other leaders in an organization have a critical influence on organizational incentives. For example, transformational leaders can timely provide employees with the resources they need through the role of leadership, such as playing the role of monitor or coach (Chebon et al., 2019; Bin Bakr and Alfayez, 2021). Therefore, employees' POS has been viewed to be primarily associated with their managers (Lipponen et al., 2018). The above functions of a leader make employees feel being strongly supported by management, a way of showing them that their organization cares about them. In this case, the employees will perceive support from their organization (Kurtessis et al., 2017). In fact, some recent studies have shown that transformational leadership facilitates employees' perception of support from the organization. For example, Asgari et al. (2020) studied college students and proposed that transformational leadership has a positive effect on employees' POS. Hermawati et al. (2021) studied perceived organization support and demonstrated that transformational leadership has an effect on the followers' POS. Dinc et al. (2022) examined the effect of transformational leadership on employees' creativity and found that transformational leadership plays a critical role in employees' POS. In multi-level organization theory models, group-level variables affect individual-level outcome variables cross-levels (Raudenbush and Bryk, 2002). In other words, transformational leadership at the group level not only affects organizational climate, but also affects individual POS and volunteer participation motivation cross-levels as well. Based on this, research on leadership must pay attention to the correlation between variables at different levels. The above theoretical discussion or research shows that transformational leadership can affect the outcome variables of employees' POS and volunteer participation motivation, and can influence the context variables of the organization (Elgamal, 2004). Therefore, through multi-level research, employees' perceptions of leaders can be aggregated to the group level, and their relationship with POS and volunteer participation motivation can be tested.

As a result, the fourth hypothesis was proposed:

> **H4: Transformational leadership has a positive cross-level effect on POS.**

Transformational leadership makes employees' job more meaningful, creates high-quality teamwork, and give employees a feeling of satisfaction. Transformational leadership has a huge effect on maintaining the environment driving volunteering (Althnayan et al., 2022). Individuals who see their job as meaningful or have an autonomous motivation are more likely to feel satisfied with their job and to help other people (Purvanova et al., 2006). Volunteering is a way to show one's altruistic value, to establish a strong relationship, to improve one's self-esteem, to shift one's attention away from personal issues, to learn and acquire new knowledge and skills about the world, and to improve career prospects (Afkhami et al., 2019). Transformational leadership affects employees' volunteer participation motivation by satisfying their needs for interpersonal relationship and building good relationships (Chan, 2020). Moreover, transformational leaders link work to employees' values through their charismatic leadership style, boost employees' confidence, and facilitate team identification and cohesion, which together elicit employees' volunteer participation motivation (Shofiyuddin et al., 2021).

As a result, the fifth hypothesis was proposed:

> **H5: Transformational leadership has a positive effect on volunteer participation motivation.**

2.2.5. Organizational climate's cross-level effect on volunteer participation motivation and OCB

Employees constitute an important part of every organization, and form a general perception of the organization based on their work in the organization and their experience with the organization's internal environment such as organization management, organizational culture, and the content and place of work. The behavior of employees is affected by this general perception (Licciardello et al., 2013). A positive organizational climate enhances employees' job performance, creates a positive employee relationship, and boosts their job satisfaction. Therefore, a positive work environment through good interpersonal relationships and a healthy organizational climate can help motivate people to volunteer (Lee and Brudney, 2015). Suresh and Venkatammal (2010) believed that organizational climate is a collection of attitudes that an organization influences individuals and groups, like rewards and interpersonal relationships. Gholami et al. (2015) viewed organizational climate as employees' perceptions of organizational characteristics, such as leadership styles, decision-making processes, and work norms. Furthermore, according to Sudibjo and Nasution (2020), and Suprapti et al. (2020), the benefits of the work environment are to create of passion for work, and improve work performance. Therefore, a positive work environment can create a good organizational climate, promote the sharing of the organization's values, beliefs, and behaviors, and then induce employees to exhibit more behaviors that are beneficial to the organization (Novitasari and Iskandar, 2022).

Many studies have found that fairness (Salam, 2020), a sense of self efficacy (Zhou and Qian, 2021), collective efficacy (Strydom, 2021), and group cohesion (Schmidthuber and Hilgers, 2019) are the antecedents of employees' ex-role behavior. Engagement in volunteer services or activities gives people an opportunity to show their altruistic values (Clary et al., 1998) and trigger their ex-role behavior. For example, Azizaha et al. (2020) and Desky et al. (2020) pointed out that the motive of an individual, group cohesion and employees' attitude are closely related to triggering employees' OCB. Therefore, establishing a good organizational climate and as such a strong group cohesion will further encourage employees' OCB (Schmidthuber and Hilgers, 2019). This study defines organizational climate as a group-level variable. Since this study uses cross-level analysis, hypotheses about the group-level effect on individual-level dependent variables can be tested (Cho and Kao, 2022). In summary, organizational climate can affect volunteer participation motivation and organizational outcomes of OCB.

Consequently, the sixth and seventh hypotheses were proposed:

> **H6: Organizational climate has a positive cross-level effect on volunteer participation motivation.**

> **H7: Organizational climate has a positive cross-level effect on OCB.**

3. Research methodology

3.1. Research structure

The research structure is presented in **Figure 1**. Based on the research objectives and hypotheses, the following effects and relationships were tested:

1) Causation between individual-level variables.
2) The moderating effect of volunteer participation motivation on individual-level variables.

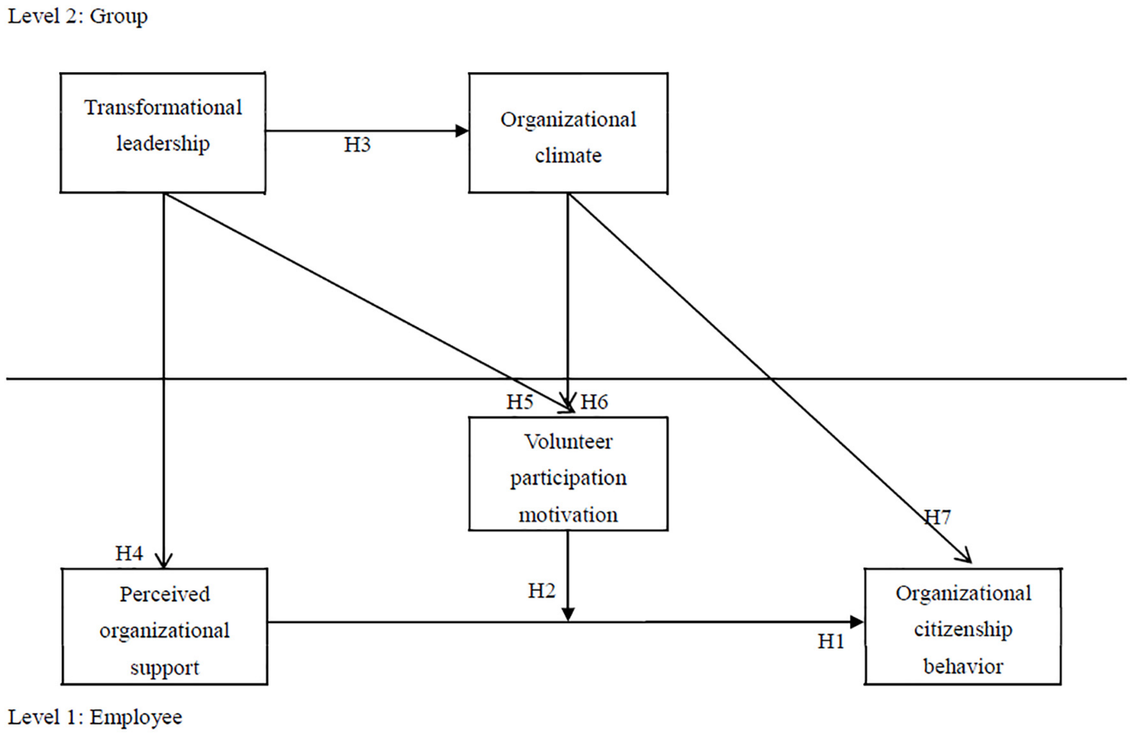

FIGURE 1
Research model.

3) Causation between group-level variables.
4) The cross-level effect of group-level variables.

3.2. Research subjects, sampling and strategies for research, or data collection

This study adopts a quantitative methodology and retrieves the data by questionnaires. In addition, this study was approved by the Research Ethic Committee of a university in Taiwan. This study sampled frontliners of Taiwan's National Immigration Agency to be the study subjects, and because of cross-level issues, this study had to take sampling from different levels into consideration. To ensure data quality and obtain reliable group-level data, this study made reference to the cluster sampling approach used in Kao (2017), and when selecting divisions for sampling the study subjects, this study set the following sampling criteria: (1) Each division should have at least 10 employees (excluding the director and the deputy director); (2) the respondents should have worked at their division for more than 6 months to ensure that the respondents have a concrete understanding of the study variables. As for the sampling method, because of limited manpower and financial resources, when collecting data, stratified sampling was conducted first, followed by quota sampling. In this study, there were two types of interviewees; one consisted of frontliners of the Border Affairs Corps under the National Immigration Agency, Taiwan. These people are responsible for checking the passport of travelers entering or exiting Taiwan at international airports or ports. They are also in charge of security-related issues at the border and for interviewing foreigners working in Taiwan or coming to Taiwan for marriage to a Taiwanese. The other type of interviewees were frontliners of the Service Affairs Corps at various Service Stations across Taiwan. They are responsible for Taiwanese with household registration entering or exiting Taiwan, reviewing and approving the stay, temporary residence, or permanent residence of travelers from mainland China, Hong Kong, Mao Cao, and other countries worldwide, and for offering immigration counseling services. In terms of the research questionnaires, two questionnaire types were used in this study. The first type was for frontliners of the sampled divisions (non-management), and the second type was for management, i.e., the direct managers, of the divisions that have employees sampled for the first questionnaire. The objective here was to determine any discrepancy between employees' self-perceived OCB and their OCB as perceived by their managers.

In addition, in order to make the sample to effectively represent the population, this study adopts a stratified two-stage sampling design, and is based on the principle of probability proportional to size (PPS) sampling. According to the current organizational structure of the Taiwan Immigration Agency, a total of 9 service centers of the Northern, Central and Southern Taiwan Administration Corps were selected, and 8 brigades (4 brigades each at the airport and 4 at the port) were selected from the 16 brigades under the Border Affairs Corps according to their regions and work attributes to maintain the principle that the odds of being selected for each case are roughly the same. In addition, before the questionnaire was administered, the respondents were explained the research themes, methods, and how to use future research results, and informed their basic rights in the research, such as the confidentiality of the respondents' relevant information. The respondents were told to be freely to participate in research and have the right to withdraw from research at any time to meet the research ethics requirements of "informed consent." Based on the sampling procedures and methods, a total of 289 valid questionnaires were obtained in this study, and the specific information will be described later.

3.3. Research questionnaires

This study's questionnaires are mostly based on questionnaires presented in studies by European and American researchers, and when translating these works, the researcher of this study followed the suggestion from Brislin (1986). To ensure the accuracy of the translation, the works were translated by bilingual translators, and reverse translation of the research variables was also performed to make sure that the Chinese version maintains the concepts of the original questionnaires. A 5-point Likert Scale ranging from strongly agree (5 points) to strongly disagree (1 point) was adopted. The questionnaires are explained below.

3.3.1. Perceived organizational support

Perceived organizational support is the development of an organization's beliefs in its employees and when employees recognize that their contribution and well-being are highly valued by the organization, employees will feel obligated to help their organization achieve its goals. Therefore, it is very important for the organization to build this belief among employees. This questionnaire was modified from the one used by Eisenberger et al. (1997). There were 15 questions after the modification, and the objective was to measure the elements of POS. One of the questions was "Does the organization value my contributions?" Another question in the questionnaire was "Does the organization actively provide administrative or training resources?"

3.3.2. Volunteer participation motivation

Volunteer participation motivation refers to the motivation of employees to voluntarily participate in activities or affairs outside the organization. It is part of social motivation and has altruism, which makes volunteers motivated to care for others voluntarily. This study adopted and modified the six aspects of volunteer participation motivation of Wan et al. (2007). In total, there were 32 questions in the revised questionnaire, and they were used to assess the six elements of volunteer participation motivation. There were ten questions for enriching life and learning motivation, the first element. One of the questions was "does volunteering enrich my life?" There were five questions for the element "social responsibility," and one of the questions was "can I make contributions to society by volunteering?" There were five questions for self-development motivation, and one of the questions was "does volunteering provide self-development opportunities?" There were four questions for the element "motivation for achievement," and one of the questions was "can I serve the public by volunteering?" For the element "institutional characteristics," there were four questions, and one of the questions was "By volunteering can I obtain printed materials from that organization or can I participate in activities held by the organization for free or with a discount?" The last element was "will realization motivation," and there were four questions, one of which was "can I volunteer to reach my full potential?"

3.3.3. Organizational citizenship behavior

Organizational citizenship behavior is considered as an unconditional work behavior of employees. Although this behavior is not clearly stipulated in the job description, employees still voluntarily engage in it, and the display of this behavior can effectively promote the performance of the organization. This questionnaire was developed based on Farh et al. (2004) and Lin (2007). Three OCB dimensions were included in this inventory: in-role behavior, organizational charitable behavior, and interpersonal altruistic behavior. Each dimension contained two sub-dimensions. For in-role behavior, the sub-dimensions were identification with the company and taking initiative. For organizational charitable behavior, the sub-dimensions were diligence, prudence and protecting the company's resources. For interpersonal altruistic behavior, the sub-dimensions were interpersonal harmony and assisting one's colleagues. When conducting the survey, both the employees and their managers were asked to fill out the questionnaires in order to eliminate the possibility of common method variance. By doing so, the researcher could assess if there is any discrepancy between the actual perception of the employees and the employees' behavioral evaluation conducted by their managers. Both questionnaires contained six questions on identification with the company. One question from that part was "should I (the subordinate) try my best to protect the company's image and actively participate in all related activities?" There were three questions under taking initiative and one of them was "If it is required for business, should I (the subordinate) go to the office earlier to do my work?" For diligence and prudence, there were 11 questions. One of the questions was "should I (the subordinate) put effort into self-enrichment in order to improve the quality of my work?" For saving the company's resources, there were three questions. One of the questions was "should I (the subordinate) try to save organizational resources such as water, electricity, and office stationery?" For interpersonal harmony, there were five questions. One of the questions was "should I (the subordinate) actively communicate and coordinate with my colleagues?" There were three questions under assisting colleagues. One of the questions was "should I (the subordinate) be happy to assist my colleagues and to solve problems encountered at work?" Altogether, there were 31 questions and six sub-dimensions.

3.3.4. Transformational leadership

Transformational leadership is a process of organizational change, based on members' consensus on organizational commitment, it can combine the common needs and aspirations of organizational members, share a group-interest-oriented vision with those around it, and create a loyal working climate. To evaluate transformational leadership, this study adopted the multifactor leadership questionnaire (MLQ) developed by Bass and Avolio (1997). MLQ covers four dimensions: six questions on idealized influence, five questions on inspirational motivation, four questions on intellectual stimulation, and four questions on individualized consideration. For idealized influence, it was used to measure the role of the leader in his or her job position. One of the questions from the idealized influence dimension is "would my supervisor put group interest above his own interest?" One of the questions from the inspirational motivation dimension was "does my supervisor have a positive view of the future?" For the intellectual stimulation dimension, one of the questions was "Why does my supervisor ask me to see a problem from various aspects?" Last, for the individualized consideration dimension, one of the questions was "does my supervisor help me realize my potentials?"

3.3.5. Organizational climate

Organizational climate is an evaluable feature of the work environment, which is the direct or indirect perception of an individual's life and job in the work environment, and it is the common understanding among members of the same organization. This study revised the organizational climate questionnaire used in Kao (2017), which is based on the Litwin and Stringer Organizational Climate Questionnaire (LSOCQ) (Litwin and Stringer, 1974). The organizational climate questionnaire used here has four dimensions and 18 questions in total: six questions on management style, four questions on interpersonal relationship, four questions on structural climate, and four questions on climate responsibility. The organizational climate questionnaire was used to evaluate management styles (e.g., the job promotion system), interpersonal relationships (e.g., a friendly climate), structures (e.g., a very high performance standard), and responsibility (e.g., individuals do not need to take any responsibility).

3.3.6. Control variables

According to studies such as Farh et al. (2004), Kao (2017), and Cho and Kao (2022), this study included age, education, seniority as the control variables and examined their relationships with other study variables.

4. Results

4.1. Background information

According to the sampling procedure, this study selected a total of 9 service centers from the Taiwan Immigration Administration Corps, and 8 brigades from the Border Affairs Corps (4 brigades each from the airport and port). There were more than 10 general employees and at least 2 managers who were selected. During the test, the time between the rotations of each unit were used to test the respondents who have finished the service until all those who work on that day were tested. A total of 289 employee questionnaires were completed and returned; 227 of them were from male employees, and 62 from female employees. This gender ratio was similar to that of employees in the National Immigration Agency. The number of respondents accounted for about 20.81% (289/1389) of the population. Most of the employees had a bachelor's degree, and 28.5% of them had a diploma from Taiwan Police College. The average age of the interviewees was 39.92, and they had worked for 11.32 years. They had worked at the current division for 4.37 years, and in each division there was an average of 21.58 people. Thirty-two participants had completed the manager questionnaire; 24 were male and 8 were female. Most of the respondents had a postgraduate degree (59.38%), while 37.5% of them had a diploma from Taiwan Center Police University. The average age of the respondents was 45.36, and they had worked for 15.43 years. At the current division, the respondents had worked for 3.21 years. In order to determine differences in the perception of employees' OCB between frontliners and their managers, this study performed a *t*-test and no significant difference was found. Therefore, both questionnaires were merged for hypothesis testing.

Table 1 presents the mean, standard deviation, correlation coefficient, and α of the study variables. According to **Table 1**, the control variables had no significant effect on other variables. The study variables had a good reliability (0.7 or above), and were positively correlated. In this study, the researcher used LISREL (maximum likelihood estimation) for confirmatory factor analysis (CFA) to determine if POS, volunteer participation motivation, OCB, transformational leadership, and organizational climate are different constructs. The results are presented in **Table 2**, which shows that the five study variables were distinct constructs. In addition, SPSS Windows 22 was used to analyze the cross-level effect.

4.2. Testing aggregated data

This study tested the group effect of transformational leadership and organizational climate (*F*-value) to determine if data can be aggregated for group-level analysis. The following parameters were used during data analysis, for transformational leadership, $\eta2 = 0.472$, $F = 7.02$, and $p < 0.001$; and for organizational climate, $\eta2 = 0.319$, $F = 4.02$, and $p < 0.001$. Therefore, the group effect of transformational leadership and organizational climate was statistically significant. In addition, to assess the consistency of rating by group members, James (1982) suggested the use of intraclass correlations (ICCs). ICC (1) reflects the consistency of rating by members on the same team. The ICC (1) coefficient criteria ranged from 0.05 to 0.3 (Bliese, 2000). In this study, the ICC (1) coefficient was 0.17 for transformational leadership and 0.22 for organizational climate. Therefore, the ICC (1) of the group variables was statistically significant. To demonstrate the appropriateness of the aggregation, this study also calculated the r_{wg} of transformational leadership and organizational climate. The mean r_{wg} of transformational leadership and organizational climate was 0.75 and 0.79, respectively, both satisfying the critical value of 0.70 (James et al., 1984). The statistical data of aggregation

TABLE 1 Descriptive statistics, correlation coefficient, and alpha coefficient.

	M	*SD*	α coefficient	Research variables				
				(1)	(2)	(3)	(4)	(5)
(1) Perceived organizational support	3.542	0.799	0.881	1				
(2) Volunteer participation motivation	3.128	0.623	0.702	0.328***	1			
(3) OCB	3.689	0.565	0.801	0.241*	0.401***	1		
(4) Transformational leadership	3.427	0.299	0.888	0.179*	0.212*	0.254*	1	
(5) Organizational climate	3.579	0.285	0.812	0.194*	0.293**	0.377***	0.321***	1

(1)–(3), individual-level research variables; (4)–(5), group-level research variables.
*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

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TABLE 2 Goodness of fit indicators for individual-level variables.

Research variable	χ2/df		GFI		NNFI		PGFI		RMSEA	
	Observed value	Ideal value	Observed value	Ideal value	Observed value	Ideal value	Observed value	Ideal value	Observed value	Ideal value
Transformational leadership	2.42		0.94		0.94		0.67		0.041	
Organizational climate	2.25		0.94		0.95		0.71		0.036	
Perceived organizational support	2.61	1.00∼3.00	0.93	>0.9	0.93	>0.9	0.63	≥0.5	0.045	≤0.05
Volunteer participation motivation	2.87		0.92		0.93		0.55		0.048	
OCB	1.89		0.96		0.97		0.79		0.027	
References	Schumacker and Lomax (1996)		Bentler (1990)		Bagozzi and Yi (1988)				Browne and Cudeck (1993)	

TABLE 3 Hierarchical regression analysis.

Model independent variables (group-level)	Model number						
	1	2	3	4	5	6	7
Group size (control variables)	0.024	0.008					
TL (independent variable)		0.307***					
F	0.192	20.124***					
Adj. R^2	0.008	0.287					
Model independent variables (individual-level)							
Age			0.025	0.082	0.041	0.079	0.082
Education level			0.038	0.056	0.032	0.051	0.056
Years of service			0.049	0.066	0.058	0.084	0.066
POS				0.319***			
VPM							
OCB						0.239***	0.267***
POS × VPM							0.335***
F			0.804	24.392***	1.057	18.341***	36.458***
Adj. R^2			0.002	0.312	0.018	0.273	0.407

Dependent variable: Model 1 and 2 are for OCL; model 3 and 4 for VPM; model 5, 6, and 7 for OCB.
TL, transformational leadership; OCL, organizational climate; POS, perceived organizational support; VPM: volunteer participation motivation (VPM). ***$p < 0.001$.

suggested that the individual-level data can be aggregated for group-level analysis.

4.3. Hypothesis testing

4.3.1. Hypothesis testing: Individual-level and group-level variables

This study tested the relationship between the control variables, the individual-level variables, and the group-level variables by Hierarchical Routing Architecture (HRA). Model 1 in Table 3 shows that group-level control variables had no significant effect on organizational climate. Model 2 shows that transformational leadership had a significant effect on organizational climate ($\beta = 0.307$, $p < 0.001$), and after adjustment, it had a R^2 of 0.287. The F-value was statistically significant ($p < 0.001$). Models 3 and 5 show that individual-level control variables had no significant effect on either volunteer participation motivation or OCB. In addition, Model 4 shows that POS had a significantly positive effect on volunteer participation motivation ($\beta = 0.319$, $p < 0.001$). The adjusted R^2 was 0.273, and the F-value was statistically significant ($p < 0.001$). It can be seen from Model 7 that volunteer participation motivation had a moderating effect on the relationship between POS and OCB ($\beta = 0.335$, $p < 0.05$). Therefore, H1 to H3 cannot be rejected. In other words, POS had a significantly positive effect on volunteer participation motivation, while volunteer participation motivation had a moderating effect on the relationship between POS and OCB. Transformational leadership had a significantly positive effect on organizational climate.

4.3.2. Cross-level hypothesis testing

This study used the hierarchical linear model (HLM) to test the cross-level effect of group-level variables.

4.3.2.1. The null mode

A HML null model with no explanatory variable was first set up to test whether the relationships among group variables, individual variables, and employees' OCB were significant and to determine whether there was any significant difference between the interviewed divisions. Table 4 shows that the between-group variances were

TABLE 4 Hierarchical Linear Modeling Results for Individual variables.

Variable	γ_{01}	τ_{00}		γ_{11}
1. The null model		**0.102*****		
2. Context effects (intercepts-as-outcomes model)			(3) Organizational climate–Volunteer participation motivation	**0.267**** **(0.101)**
(1) Transformational leadership–Perceived organizational support	**0.184*** **(0.062)**		(4) Organizational climate–OCB	**0.352***** **(0.092)**
(2) Transformational leadership–Volunteer participation motivation	**0.201**** **(0.154)**			

The numbers in bracket are standard error; (1) to (4) are the contextual effects of group-level variables on individual-level variables. For example, transformational leadership–perceived organizational support is the contextual effect of group-level transformational leadership on the individual-level perceived organizational support.
The table lists the indicators for tested hypotheses only.
The bold values indicate the test indicators for each hypothesis.
*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

significantly non-zero ($\tau00 = 0.102$, df = 24, Wald $Z = 3.572$, $p < 0.01$), and therefore employees' OCB was different between divisions.

4.3.2.2. Context effect

This study performed the HLM intercepts-as-outcome model testing on volunteer participation motivation and OCB, and the objective was to explain information related to Level 1 intercept variances. At the same time, this study used group-level transformational leadership and organizational climate as the explanatory variables of Level 2 and hypothesized that transformational leadership and organizational climate could positively and in a cross-level fashion affect POS, volunteer participation motivation, and OCB. To test the context effect of the group level on individual-level variables, this study used the γ_{01} parameters for the testing. Table 4 shows that transformational leadership had a cross-level main effect on POS ($\gamma_{01} = 0.184$, SE = 0.062, $t = 2.01$, $p < 0.05$) and on volunteer participation motivation ($\gamma_{01} = 0.201$, SE = 0.154, $t = 2.87$, $p < 0.01$); so did organizational climate on volunteer participation motivation ($\gamma_{01} = 0.267$, SE = 0.101, $t = 3.16$, $p < 0.01$) and on OCB ($\gamma_{01} = 0.352$, SE = 0.092, $t = 3.88$, $p < 0.001$). Therefore, H4, H5, H6, and H7 cannot be rejected.

5. Discussion and conclusion

5.1. Conclusion

The objective of this study was to explore the relationships between POS, volunteer participation motivation, and OCB in National Immigration Agency frontliners. This study also examined the moderating effect of volunteer participation motivation and the cross-level effect of transformational leadership and organizational climate. The results showed that all the hypotheses of this study were supported. It was found that employees' POS had a positive effect on OCB, while volunteer participation motivation had a moderating effect on the relationships between the above mentioned variables. Furthermore, transformational leadership and organizational climate were found to have a cross-level effect on enhancing employees' POS, boosting their motivation to volunteer, and triggering more OCB in employees.

In addition, this study has demonstrated that improving employees' POS and triggering their volunteer participation motivation are important for increasing OCB in employees. This study also verified that an organization can trigger more employee OCB through the use of transformational leadership, which motivates members to achieve a common organizational goal, promote a vision encouraging people in the organization to value the group interest, create a work climate facilitating organization identification, and enhance employees' group identification and cohesion. The above strategies enable a leader to optimize employees' POS and motivate employees to volunteer, thereby inducing more OCB in the employees.

5.2. Management implications

This study used HLM to analyze and explain the cross-level effect of organizations. Appropriate statistical methods were used to assess the contextual effect of group-level variables on individual-level variables, so that the organizational or group effect on individual behavior can be concretely assessed. Secondly, the cross-level testing methods enabled the study to better understand the approaches and means, such as transformational leadership, that an organization can use to encourage its employees at the multidimensional organizational level to exhibit attitudes or behaviors benefiting the organization.

This study has made several important contributions to practice. First, the study result showed that a manager's transformational leadership and organizational climate are important for frontliners of the organization. In a multi-level and service-oriented public sector, a manager's leadership style and workplace climate play a critical role in shaping employees' altruistic behavior and triggering various attitudes or behaviors of employees that are good for the organization. Secondly, this study found that a transformational leader encourages his or her subordinates to handle problems or take challenges by a new approach; they also enlighten the subordinates intellectually at work. Transformational leaders can handle not only the tasks assigned by superiors, but also deal with issues of "people" (i.e., subordinates) (Mahmood et al., 2018). Based on this, we advocate that the Taiwan Immigration Agency should train the direct supervisors of their front-line employees to have a transformational leadership style, so that these supervisors can organize his team, build a common understanding of employees' goals or vision, and achieve organizational and personal goals through effective leadership, communication coordinate and cooperate to achieve organizational and personal goals, and show more OCB to improve organizational performance. Third, transformational leaders create a lively, enthusiastic, and pleasant climate in the organization, and guide employees to do their best to complete a task. Fourth, this study found that employees' volunteer participation motivation can indeed reinforce a positive relationship between POS and OCB. Moreover, employees can also acquire valuable experiences from volunteering, which may encourage them to offer their organization concrete and constructive suggestions to improve their services to the public. Based on this, it is the responsibility of the supervisor to lead the department to establish a "correct" organizational clime. Therefore, this study believes that when recruiting employees, Taiwan's immigration agency should focus on employees who can complement the organization, and provide opportunities for internal promotion in each position, so that employees can develop a sense of trust in the organization. In addition, the organization should establish a fair and immediate reward mechanism, based on the performance of the team, so that team members can establish a higher team awareness and are willing to work hard for the team's common goals. Furthermore, the organization can also enhance employees' awareness of teamwork through education and training to enhance organizational cohesion and promote organizational effectiveness (Para-González et al., 2018).

5.3. Research limitations and suggestions for future researchers

This study has obtained many findings. However, there are some limitations in research. Firstly, since this research is limited by the researchers' time, manpower, and financial factors, the empirical objects are limited to the front-line employees and their managers who worked in the Taiwan Immigration Agency at the time of the questionnaire test, so whether the results of this study can be generalized to other similar agencies, such as border police, yet to be further analyzed and clarified. Therefore, we recommend that future researchers expand the scope of research to all border enforcers such as customs, police and coast guards. In addition, this research is mainly based on quantification, it is cross-sectional research. Therefore, this study suggests that subsequent researchers should add a longitudinal survey method to specifically measure the changes in respondents' attitudes or behaviors in the research variants.

Data availability statement

The original contributions presented in this study are included in this article/supplementary material, further inquiries can be directed to the corresponding authors.

Ethics statement

The studies involving human participants were reviewed and approved by the Ministry of Science and Technology, Taiwan. Written informed consent to participate in this study was provided by the participants.

Author contributions

J-CK and R-HK: conceptualization and validation and formal analysis. C-CC: methodology, software, investigation, and resources. All authors contributed to the article and approved the submitted version.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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