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Organizational culture and climate: New perspectives and challenges

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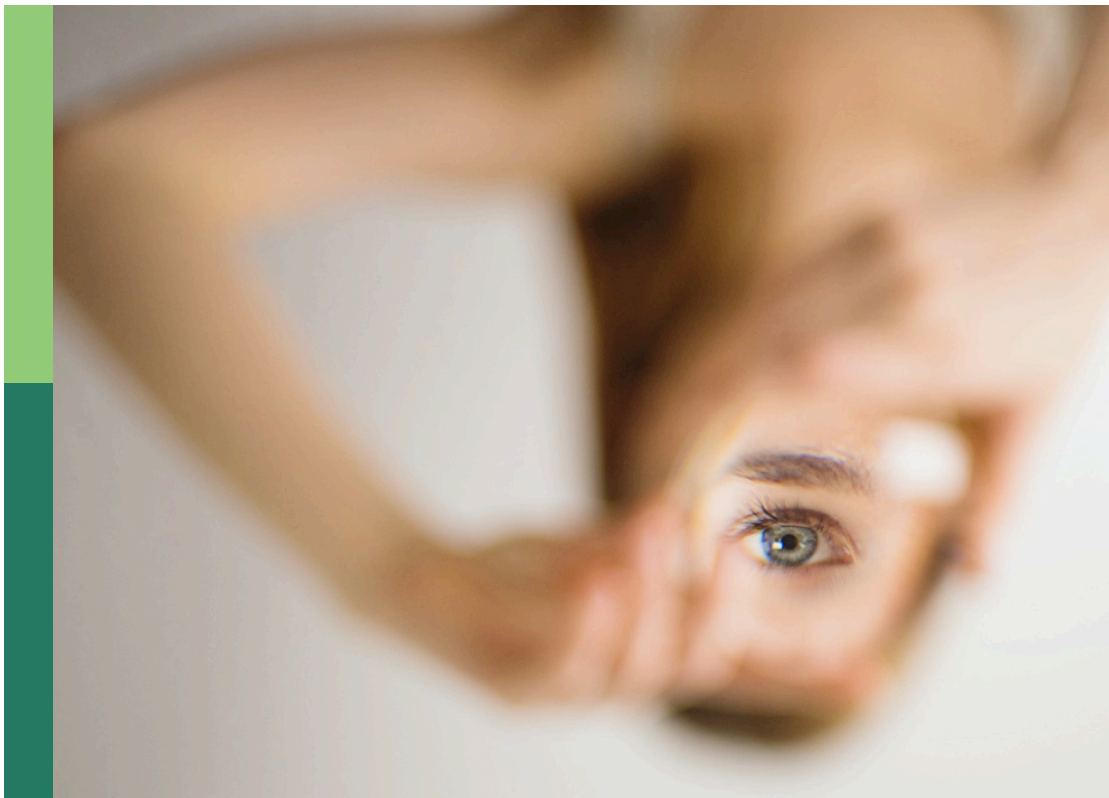

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Organizational culture and climate: New perspectives and challenges

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Editorial: Organizational culture and climate: new perspectives and challenges

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Editorial on the Research Topic
Organizational culture and climate: new perspectives and challenges

Organizational culture is established in accordance with organizational aims as a set of common mental assumptions that lead to interpretation and action in firms by defining appropriate behavior for various contexts. Accordingly, it includes the values, activities, philosophy, and ideals of an organization (Martin, 2001; Rahman and Hadi, 2019).

All this is communicated and demonstrated through formal and informal behaviors as well as visual, verbal, and material artifacts representing the most tangible and visible manifestations of an organization's culture (Schein, 2010). Therefore, it could be said that organizational culture provides individuals with indications for both understanding and giving sense of what their organization is about (Ravasi and Schultz, 2006). For these reasons, organizational culture is considered a characteristic that helps firms to achieve and maintain competitive advantage and improve their bargaining power (Rahman and Hadi, 2019).

Following Moran and Volkwein (1992), organizational climate represents the shared perceptions, feelings, and attitudes that members of an organization have about its fundamental elements: the established norms, values, and attitudes of the organization's culture. This climate has the potential to influence employees' individual behavior either in a positive or negative way. While organizational culture gives the intangibles that are likely to accumulate to build the deeper psychology of people in a place, the climate offers an approach to the tangibles on which managers can focus to develop the behaviors they need for effectiveness (Chaudhary et al., 2014). Therefore, these two concepts complement each other and can be mutually useful in practice.

There is much we do not yet know about these important elements of the current business environment. Given the transversality of the notion of organizational culture and climate, the main purpose of this Research Topic is to provide a better understanding of these two concepts. To do so, we bring together a Research Topic of works addressing the role of organizational culture and climate from different perspectives. More evidence is needed to further understand how culture and climate can affect organizational outcomes or, conversely, what practices are best to improve them.

In doing so, Alonso Gallo and Gutiérrez López attempt to systematize the changes in the legislation on effective equality between men and women in business and to analyze its effect on organizational culture. The authors, therefore, delve into the adaptation of business culture to the new legal framework and the overcoming of gender stereotypes that have been guiding business management in the last decade.

On the other hand, based on the need for a contract-focused culture that emphasizes monitoring output and outcomes, Ngai et al. focus on demonstrating the effectiveness of social services through what is called evaluation capacity. To do so, the study develops the Evaluation Capacity Scale (ECS), a self-reporting instrument of NGO practitioners' capacity to conduct an effective evaluation of their service programs.

Organizational culture is often perceived as a valuable strategic asset supporting business transformation and the exploitation of digital technologies. Still, it can also be the source of inertia that impedes change. To address this issue, Busco et al. explore how digital strategy and digital leadership are the main factors affecting the acquisition of digital culture. In the same line of thought, Díaz-García et al. addressed how Higher Education Institutions (HEIs) are experiencing the cultural change resulting from digitalization and digital transformation.

Based on the idea that organizational climate and culture are instruments that lead to a better understanding of stakeholder needs, engaging them at a strategic level, and leading to a better corporate image, Álvarez-Foronda et al. try to provide an understanding of today's internal audit departments. In this sense, the authors explore how scientific literature has addressed the role of this internal function as part of the corporate governance and guardian of the organization's culture and climate, as well as the opportunities that new technologies offer to increase their effectiveness and efficiency.

Different dimensions of organizational climate are also addressed in this Research Topic. The work of Li et al. focuses on organizational results, like innovation performance. In this vein, the study explores the mechanism of team learning climate on innovation performance. Their results prove the positive effect of team learning climate on knowledge integration capability and innovation performance, among others.

The rest of the works are more focused on individual employee outcomes. Over time, numerous explanations and operationalizations have been developed for organizational climate and work satisfaction and employee wellbeing, which have been established as important pillars of research and practice in organizational behavior and organizational psychology. In this line, Santana and Pérez-Rico examine the dynamics of climate and job satisfaction in healthcare organizations from the practice and research perspectives. Accordingly, they identify measures of climate and job satisfaction used in healthcare settings, assess their psychometric properties, and appraise the overall quality of underlying studies.

On the other hand, Su and Hahn explore whether millennial employees have higher affective wellbeing in organizations with a good ethical climate. Their findings support the crucial role of a moral consensus shared by employees -ethical climate- to foster organizational citizenship behavior (OCB) and affective wellbeing of this generation of workers. Similarly, Teetzen et al. propose that organizational health climate (OHC) is an important organization-based resource for a health-oriented leadership style, which mediates the relationship between organizational health climate (OHC), employee job satisfaction, and emotional exhaustion.

Finally, and based on the idea that the organizational climate predicts organizational commitment and other employee behaviors, Gómez-Jorge and Díaz-Garrido assume that this element can also increase the level of self-esteem in the long term. In this context, the study aims to analyze the impact of self-esteem in the work environment on teaching and research productivity within the field of higher education.

Taking into account all the papers collected in this Research Topic, we strongly believe that progress has been made in the academic literature on organizational culture and climate. As organizational culture and climate is one of the topics of great interest for various stakeholders in the company, the research papers of this Research Topic can serve as a guide/guidance for improving organizational climate or culture, as these are important aspects for the proper functioning of any company in any industry.

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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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References

Chaudhary, R., Rangnekar, S., and Barua, M. K. (2014). Organizational climate, climate strength and work engagement. *Proc. Soc. Behav. Sci.* 133, 291–303. doi: 10.1016/j.sbspro.2014.04.195

Martin, J. (2001). *Organizational Culture: Mapping the Terrain*. London: Sage publications.

Moran, E. T., and Volkwein, J. F. (1992). The cultural approach to the formation of organizational climate. *Hum. Relat.* 45, 19–47. doi: 10.1177/00187267920 4500102

Rahman, Z., and Hadi, H. K. (2019). Does organizational culture matters in organizational change? Transformational leadership and cynicism about organizational change. *KnE Soc. Sci.* 3, 353–362. doi: 10.18502/kss.v3i11.4019

Ravasi, D., and Schultz, M. (2006). Responding to organizational identity threats: exploring the role of organizational culture. *Acad. Manage. J.* 49, 433–458. doi: 10.5465/amj.2006.21794663

Schein, E. H. (2010). *Organizational Culture and Leadership, Vol. 2*. New York, NY: John Wiley and Sons.

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A multi-level study on whether ethical climate influences the affective well-being of millennial employees

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Millennial employees are increasingly paying more attention to well-being in the workplace and it has become an important issue for managers. Given that millennial employees are more sensitive to ethical issues, this study began by analyzing an ethical element in the organization—the ethical climate—and explored whether millennial employees have higher affective well-being in organizations with a good ethical climate. We verified our hypotheses based on 288 valid questionnaires collected from 40 teams. The results showed that: (1) ethical climate was a positive predictor of millennial employees' organizational citizenship behavior (OCB) and affective well-being, (2) employees' OCB partially mediated the relationship between ethical climate and affective well-being, and (3) an employee's moral identity effectively moderated the relationship between ethical climate and affective well-being, although it did not play a significant moderating role between ethical climate and OCB. These findings provide empirical support for applying situational strength and social information processing theories and emphasize the importance of cultivating an ethical climate in organizations.

KEYWORDS

affective well-being, ethical climate, millennials, moral identity, organizational citizenship behavior

Introduction

People born between 1980 and 2000 are known as millennials, and it is estimated that by 2025, millennials will comprise 75% of the global workforce (Brant and Castro, 2019). Several studies have raised the importance of the subjective experiences of millennial employees in the workplace, suggesting that as a cohort they tend to place more value on their emotional experiences when evaluating their overall satisfaction, performance levels, and decision to remain with an organization (García et al., 2019; He et al., 2019). Millennial employees who experience high levels of affective well-being at work are more likely to be more creative, resilient, and socially competent (Badri et al., 2022). More importantly, they are more likely to remain committed to their work and organization

(Yuniasanti et al., 2019). Therefore, improving the affective well-being of millennial employees has become a key challenge for managers.

Millennials have grown up in an age when seemingly no behavior goes unnoticed or unreported. There is now a 24-h news cycle, increased government oversight, and a significant increase in reporting of large-scale ethical scandals (e.g., the 2008 milk scandal), while social media has become all-pervading (VanMeter et al., 2013). The Generational Differences in Workplace Ethics survey, which was conducted by the Ethics Resource Center, shows that millennials notice misconduct in the workplace more than previous generations. In addition, 67% would choose to report their observed misconduct, compared with 39% of older workers. According to Ernst and Young's (2017) Asia-Pacific Fraud Survey Report, more than 80% of millennials—the largest proportion compared with other generations—expressed reluctance to continue working for organizations that were involved in unethical practices, such as fraud, bribery, and corruption. Previous research has demonstrated that millennials also value clear and ethical rules and expectations (Curtin et al., 2011). Having a clear value statement, which is known to employees and evidenced in the workplace, is key to workplace satisfaction among millennials (Bowen, 2010). As the ethical climate in the workplace is an ethical guideline shared within an organization and defines ways of dealing with ethical issues, we believe that the ethical climate of a workplace is a concern of millennial employees. Emotions can arise in response to specific environmental events, according to the cognitive theory of emotions which states that cognition triggers emotions (Lazarus, 1991). However, the difference between negative and positive emotions is one of the personal assessments regarding the particular event's impact on the individual's goals and values (Bagozzi et al., 2003). Thus, events that a person evaluates as consistent with their goals or values can trigger positive emotions (e.g., happiness, contentment, and pride), while events at odds with one's goals or values can trigger negative emotions (e.g., anger, sadness, and shame; Wijewardena et al., 2014). Therefore, since millennials are perceived to be sensitive to ethical issues, we also believe that millennials will experience more positive emotions in an organization with a good ethical climate.

An ethical climate can be defined as a moral consensus shared by employees, while affective well-being can be thought of as an employee's psychological and emotional experience. Since both of these are intangible spiritual experiences, we need to develop a tangible behavior that can connect the two. In addition, as the ethical climate is an essential aspect of organizational culture, it can directly influence how people behave (Teresi et al., 2019). Organizational citizenship behavior (OCB) is a voluntary and entirely selfless activity that employees undertake outside of their job responsibilities, significantly impacting the organization. OCB is also the most common and accessible extra-role pro-organizational behavior visible in the workplace. Previous research has shown that pro-social behavior can effectively boost mood (Guo et al., 2018), although few studies have investigated whether OCBs are directly related to the health and well-being of employees (Baranik and Eby, 2016). This study, therefore, adopts a resource-rich view and focuses on the potentially positive impacts of OCB on well-being. The extant literature on OCB has not widely discussed this view (Lam et al., 2016). Many previous studies have examined the relationship between ethical climate and OCB (Dinc and Aydemir, 2014; Aloustani et al., 2020), but few studies have combined OCB and ethical climate with employees' affective well-being. Therefore, this study uses OCB as a mediator variable to further explore the relationship between OCB and the affective well-being of millennial employees.

Recent research has also shown that the impact of an ethical climate on employees will vary depending on their personalities (Al Halbusi et al., 2020). When the values of the individual and the organization coincide, employees will show more positive attitudes (Wu et al., 2020). Moral sensitivity is affected differently by situational and individual factors, with individual characteristics (moral identity) having a significant impact on moral sensitivity (Sparks, 2015). Therefore, this study will contribute to this growing body of literature by testing whether employees' moral identities will moderate the impact of the ethical climate on OCB and affective well-being.

The overall objective of this study is to explore the relationship between ethical climate and millennial employees' affective well-being and to establish a framework for confirming OCB's mediating role and moral identity's moderating role. This research extends the available literature on ethical climate as an organizational variable since relatively few studies have analyzed the effect of ethical climate on psychological state compared with other outcome variables (Newman et al., 2017). Previous research has focused more on the impact of ethical leadership on employees' affective well-being (Ahmad, 2019; Kaffashpoor and Sadeghian, 2020). However, ethics is a group-level phenomenon that can shape an organization's internal relations and employee attitudes through ethical climates (Naber and Moffett, 2017). This study is a response to Newman et al. (2017) call to use situational strength theory (SST) to broaden our understanding of ethical climate. We have conducted an in-depth analysis of the relationship between ethical climate and affective well-being, and the mediating role of OCB. Previous studies have analyzed OCB from a resource consumption perspective and have shown that OCB consumes resources and fosters negative emotions. Positive psychology posits that positive and negative emotions can co-exist, and cannot be viewed as a dichotomy. From a resource-rich perspective, this study predicts that millennials can realize the value of helping others and gain a greater sense of work meaning through OCB, thereby increasing their affective well-being. This will also expand the previous hypothesis of the relationship between OCB and well-being. Previous studies have examined the relationship between ethical climate and OCB (Dinc and Aydemir, 2014; Aloustani et al., 2020) and the relationship between OCB and well-being (Baranik and Eby, 2016; Kaur and Kang, 2019). However, to the best of our knowledge, no study has conducted a multi-level model analysis that combines the three factors and the

cross-level moderation of moral identity. We believe that this study is the first to verify the moderating role of moral identity as a personal characteristic in the relationship between ethical climate and affective well-being, which provides empirical evidence for the person-organization (P-O) fit theory. These findings of this study will provide some practical implications for managers who hope to boost the well-being of their millennial employees.

Literature review and hypotheses development

The ethical climate and employees' affective well-being

Qualls and Puto (1989) proposed that the operationalization of the ethical climate measures individuals' perceptions of the procedures, practices, values, and norms that govern ethical decision-making within an organization. We will therefore use Mayer et al. (2010, p. 7) definition in this study, which refers to ethical climate as "the holistic impression that individuals have regarding ethical policies, practices, and procedures within a unit or organization." An organization's ethical climate comprises the common normative beliefs and values of its employees regarding ethical issues. It can also be thought of as a moral code—behavioral principles that drive community and organizational perceptions of right and wrong. This research assesses the presence and implementation of ethical codes and policies and management actions related to ethics within an organization through seven-item scales.

Situational strength is defined as "implicit or explicit cues provided by external entities regarding the desirability of potential actions" (Meyer et al., 2010, p. 122). Strong situations have clear cues and clear behavioral expectations for reducing situational ambiguity (Newman et al., 2017). Situational intensity theory states that a strong ethical climate involves communicating clear and consistent information regarding the scope of ethical behavior that an organization considers acceptable and enforcing it by providing positive consequences for adherence and negative consequences for violations. An employee can feel uncertain about their moral obligations if there are no clear and conventional moral standards within their organization (i.e., the ethical climate)—an uncertainty that can result in vague and ambiguous ethical expectations. Role ambiguity is the most widely recognized source of psychological strain (De Clercq et al., 2019) and often occurs when employees are uncertain about their job expectations and responsibilities (Low et al., 2001). Researchers define the ethical climate of a workplace as the common opinion of "what is ethically acceptable behavior" and how ethical problems should be managed and controlled in the workplace. An ethical climate determines decision-making, moral criteria for understanding, and employees' behavior in response to ethical issues, and helps employees to solve their moral problems by providing definitive guidance on what they should do (Naz et al., 2019). Researchers believe that when employees know what rules and procedures guide their actions, they perceive an absence of ambiguity within themselves (Martin and Cullen, 2006). Therefore, according to SST, an explicit ethical climate will reduce employees' ambiguity, thereby reducing psychological pressures and improving affective well-being. In addition, ethical climates based on principle-centered criteria would facilitate decision-making based on organizational codes and regulations, reducing uncertainty and favoritism.

According to the stated moral principles, people reward ethical behaviors and punish unethical ones to ensure fairness (Agrawal, 2017). Organizational justice is one of the factors affecting employee well-being (Heffernan and Dundon, 2016). The ethical climate in a particular workplace forms a group experience where employees feel free to discuss ethical issues with their peers and management, and always feel supported when facing a moral dilemma (Snell et al., 2010). This type of support for ethical behavior can increase job satisfaction (Yang, 2014). By contrast, if employees perceive the ethical climate as weak, they will perceive a lack of support from their organization in meeting normative expectations and discussing ethical issues. Organizations with an unethical climate may pressure employees to engage in unethical behaviors, resulting in distress and dissatisfaction whenever an ethical conflict arises (Huhtala et al., 2016). Zhou et al. (2018) research found that a strong and unambiguous ethical climate enhances cognitive and emotional bonds between employees and the organization. If the organization upholds ethical values, norms, and beliefs, the ethical climate can promote positive interaction among employees and increase job satisfaction (a measure of job-related affective well-being; Domino et al., 2015; Hsieh and Wang, 2016). Therefore, we propose the following hypothesis.

> *H1*: The ethical climate is positively related to employees' affective well-being.

Ethical climate and employees' OCB

As mentioned earlier, OCBs are voluntary and altruistic activities performed by employees outside of their job responsibilities for which they may not get paid or rewarded (Podsakoff et al., 2000). OCB includes "contributions to the maintenance and enhancement of the social and psychological context that supports task performance" (Organ, 1997). There are five aspects to OCB: civic virtue, which Fassina et al. (2008) briefly summarize as follows: (1) altruism, in which the individual selflessly helps other employees in an organization, such as helping new employees adapt to the workplace; (2) courtesy, preventing colleagues from encountering problems and troubles, and informing them of precautions in advance; (3) conscientiousness, wherein employees show positive behaviors outside of company regulations, such as proactively protecting organizational resources; (4) civic virtue, wherein employees show a positive

attitude and sense of responsibility toward company activities, such as actively participating in organizational meetings; and (5) sportsmanship, where employees do not think or act negatively in the workplace. (e.g., they will not complain about any minor inconveniences).

Social information processing theory shows how individuals utilize key cues and information from their surroundings to understand how to act appropriately in a particular environment (Salancik and Pfeffer, 1978); it is the core theory that analyzes the effect of ethical climate on employees' OCB. When applying this theory to the workplace, employees would collect important information and cues from their surroundings and make suitable decisions or take action accordingly. Employees can observe, experience, and interpret more ethical behaviors when immersed in a conducive ethical climate, allowing them to behave in a manner that caters to their organization's ethical values (Teng et al., 2020). Furthermore, teams with a highly ethical climate may reinforce external formal systems by rewarding ethical behavior or punishing unethical behavior. Thus, these tangible external rewards reinforce employees' motivations for pro-social behavior (Bai et al., 2019). Similarly, other team members may be rewarded for ethical behavior or punished for unethical behavior, which will allow them to learn and behave in accordance with their team's ethical climate (e.g., participating in pro-social behaviors such as OCB) (Aloustani et al., 2020). Therefore, when employees believe that their team's climate is ethical, their ethical decision-making and behaviors are more likely to be affected. Employees who work in a highly ethical climate have greater ethical awareness, pay more attention to ethical issues, and engage in more OCB (Newman et al., 2017). Previous research has shown that a highly ethical climate positively impacts OCB (Çavuş and Develi, 2017; Lee and Ha-Brookshire, 2018) and positively mediates the relationship between leadership and OCB (Sendjaya et al., 2019; Fatima and Siddiqui, 2020). Based on the above reasoning, this study proposes that group members who observe similar social influences and clues in a common ethical climate will be more likely to participate in OCB.

> *H2*: Ethical climate is positively related to employees' OCB.

Mediation of OCB on the relationship between ethical climate and employees' affective well-being

This study posits that OCB can increase the meaningfulness of work and enrich personal resources, thereby enhancing individual affective well-being. When employees are more involved in OCB, they feel more capable of helping others and creating positive changes for both the employees and the organization. Therefore, they are more likely to experience a higher level of self-efficacy, enabling them to feel competent to effect change or exercise control in their environment (Rosso et al., 2010). In addition, this sense of self-efficacy enhances their sense of meaning at work (Lam et al., 2016).

This study also assumes that those who participate in OCBs are more likely to receive interpersonal cues from leaders or colleagues, which will also provide a more meaningful experience at work. For example, when managers witness an employee's OCB, they may praise the employee and associate their OCB with organizational values that reinforce these pro-social behaviors, thereby enhancing employees' perceptions of the meaningfulness of work. Similarly, when colleagues directly benefit from OCB, they may express sincere gratitude, further enhancing their personal sense of meaningfulness (Lam et al., 2016). The more an employee engages in pro-social behavior, the more they will perceive their job as meaningful, valuable, and worthwhile (Contreras-Pacheco et al., 2021), which, in turn, is likely to lead to improved psychological and physical health (Lease et al., 2019).

Furthermore, from the conservation of resources (COR) theory's perspective, OCB is a positive interpersonal activity that generates positive psychological resources and may improve positive emotions (Chen et al., 2020). As mentioned earlier, OCB enables employees to realize that they can control or influence changes in the organizational environment. It also helps employees establish more meaningful interpersonal interactions to meet personal relatedness demands (Kaur and Kang, 2019). This means that positive events, such as OCB, build resources by fulfilling an individual's needs for relatedness and competence. When a person fulfills their needs and meaningfulness, their affective well-being will increase (Kerulis, 2018).

Employees can observe, experience, and interpret more ethical behaviors when immersed in a strong ethical climate within an organization. They can learn and behave in accordance with an organization's ethical climate, such as participating in pro-social behaviors like OCB (Aloustani et al., 2020). OCB also helps employees establish more meaningful interpersonal interactions, helping them realize that they can create positive changes for others and the organization. These positive experiences will increase the meaning of work, enrich personal resources, and improve personal affective well-being. Therefore, our third hypothesis states that OCB is a mediating variable in the relationship between ethical climate and well-being.

> *H3*: OCB mediates the relationship between ethical climate and employees' affective well-being.

Moderation of moral identity

Moral identity is "a self-conception organized around a set of moral traits," representing the embedding degree of morality in one's self-awareness (Aquino and Reed, 2002). Fundamentally, an individual's moral identity seeks answers to the question, "Am I a moral or immoral person?" (Zhu et al., 2011, p. 151). The attributes of moral identity, therefore, are individual characteristics. Previous research indicated that the impact of ethical climate on employees

will differ depending on their personal characteristics (Al Halbusi et al., 2020). Thus, we will use moral identity as a moderator variable to explore whether the impact of ethical climate on employees' attitudes and behaviors varies with the degree of an employee's moral identity. Moral identity, which is a crucial part of the personal moral "self," acts as an essential self-regulatory mechanism for moral behaviors (Jennings et al., 2015). In this regard, and based on the motivation of self-consistency, individuals act in ways that are consistent with how they see themselves (i.e., their identity; Chuang et al., 2016). According to social learning theory (SLT), employees with a higher moral identity are more likely to notice and act on moral cues from their environment, fostering their social learning from their surroundings. This is because those with a high moral identity will be more sensitive to relevant moral cues in the context (Hannah et al., 2011), which is important since SLT states that capturing the attention of observers is the first and most important step in observational learning. In contrast, employees with a lower moral identity possess less moral content in their self-concepts. They would therefore be less likely to activate the moral model and make ethical factors in this context less salient (Wang et al., 2019). Furthermore, moral identity increases an individual's sensitivity to the moral factors in their environment and the degree to which they attach importance to these factors, thereby enhancing their moral evaluations (Kurpis et al., 2008). Previous research has shown that employees with strong moral identities when working within a strong ethical climate engage in less unethical behavior than employees with lower moral identities (Ge, 2018). Gerpott et al. (2019) point out that moral identity positively promotes OCB among employees. Therefore, this study believes that employees with high moral identity will identify more with the organization's ethical climate and make more OCBs.

> *H4*: Employees' moral identities moderate the relationship between ethical climate and OCB such that this relationship is stronger for employees possessing a higher moral identity.

The P-O fit refers to the degree of congruence between employees and organizations regarding values, goals, norms, and beliefs (Chatman, 1989). Central to the P-O fit construct is the congruence between individual and organizational values. McCulloch and Turban (2007) believed that the actual fit between individual and organizational ethical values is an important predictor of employee attitudes. When an employee appears to have values consistent with their organization, they would perform well at their job and show positive work attitudes (Wu et al., 2020). P-O fit has a positive effect on employees' job satisfaction (an important measure of job-related well-being). Merecz and Andysz (2012) found that P-O fit is positively related to employees' health, reflected in the indices on mental and somatic health status. However, when employees perceive a meaningful inconsistency between their values and norms and those of their organization, the resulting dissonance will produce negative job performance and organizational results, producing negative emotions. Therefore, this study believes that when employees have a high level of moral identity in an organization with a strong ethical climate, they will feel more aligned with the values of their organization, improving their affective well-being in the workplace.

> *H5*: Employees' moral identities moderate the relationship between ethical climate and employees' affective well-being, such that this relationship is stronger for employees possessing a higher moral identity.

Based on the above assumptions, we designed the research model shown below (Figure 1).

Materials and methods

Sample and procedure

Unlike large-scale enterprises, smaller and medium-sized enterprises tend to ignore ethical issues. According to the National Bureau of Statistics of China, two of the three provinces that have the highest numbers of small and medium-sized enterprises (SMEs) are Jiangsu Province and Zhejiang Province. The combined number of SMEs in these two provinces accounts for nearly a quarter of SMEs in China (source)[1], and it was from SMEs in these two provinces that we collected our data.

First, we contacted each company's human resources (HR) department. Then, with the consent of the team leader, the HR department provided the team leader's contact information. We distributed questionnaires, explained the purpose of our research on the first page of the questionnaire, and guaranteed anonymity and confidentiality for all respondents. After the participants had read and agreed with the content of the first page, they completed the questionnaire. When the team leaders received the questionnaire, we provided them with different team numbers. We then asked them to inform their team members of their team number so that they could answer the question "Please write down your team number" in the questionnaire. In this way, we used the team number to match the data of team members and team leaders. Data were collected from two sources (team leader and team member) in two phases (four weeks apart) to minimize common method bias. Between the 11th and 18th of January 2021, team leaders were asked to rate their team's ethical climate, and team members were invited to evaluate OCB and moral identity. We received 662 responses from 71 teams. However, after excluding incomplete and invalid questionnaires (e.g., questionnaires where the respondent selected the same option for all items), we had 526 valid questionnaires from 56 teams. Four weeks later, team members rated their affective well-being between the 15th and 22nd of February 2021, and we obtained a total of 383 valid questionnaires. After matching the last four digits of the

1 http://lwzb.stats.gov.cn/pub/lwzb/gzdt/202005/W020200603379890884764.pdf

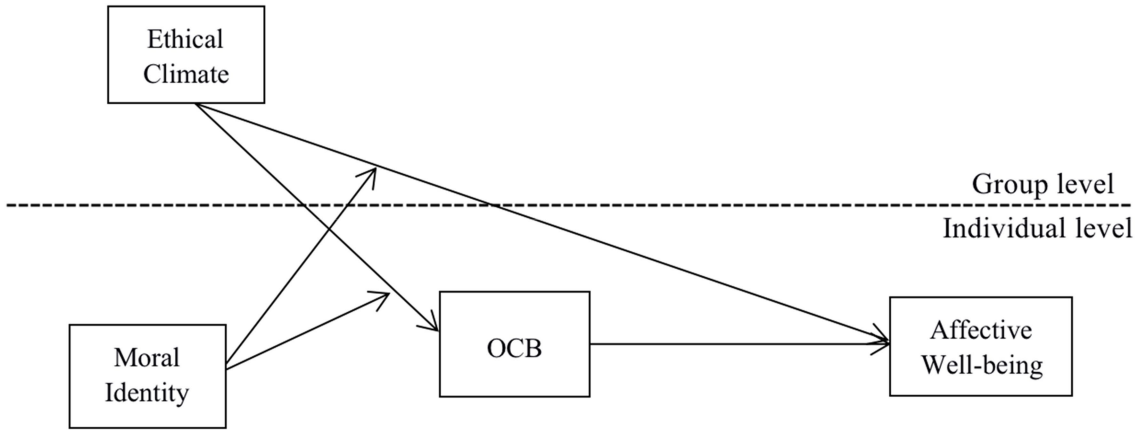

FIGURE 1
Research model.

mobile phone number in the valid questionnaire collected at the first time point with the last four digits of the mobile phone number in the valid questionnaire collected at the second time, we obtained a final total of 288 valid questionnaires from 40 teams.

We used SPSS 26.0 to analyze the descriptive statistics of the basic demographic characteristics of the valid questionnaire. Among the 40 team leaders, 77.5% ($N = 31$) were male, and 22.5% ($N = 9$) were female. Regarding the ages of the team leaders, 47.5% ($N = 19$) were aged 31–40, 42.5% ($N = 17$) were aged 41–50, and 10% ($N = 4$) were aged 51–60. Because the research object of this study focuses on millennial employees, the age of some leaders over 40 would not be an issue in this study. Regarding the team leaders' educational level, 2.5% ($N = 1$) were high school graduates or below, 32.5% ($N = 13$) had college degrees, and 65.0% ($N = 26$) had bachelor's degrees.

Among the 248 team members, 56.9% ($N = 141$) were male, and 43.1% ($N = 107$) were female. A total of 41.1% ($N = 102$) were aged 20–30 and 58.9% ($N = 146$) were aged 31–40. Team members' work experience included 77.1% ($N = 191$) with 1–3 years' experience, 21.0% ($N = 52$) with 4–6 years' experience, and 1.9% ($N = 5$) had 7–10 years' experience. Regarding the team members' educational level, 1.2% ($N = 3$) were high school graduates or below, 16.5% ($N = 41$) had college degrees, and 82.3% ($N = 204$) had bachelor's degrees.

Measures

In this research, we adopted Schwepker (2001) seven-item ethical climate scale to measure the team's ethical climate. A sample item was "My work team strictly enforces a code of ethics." Participants used a five-point Likert scale (ranging from 1: *strongly disagree*, to 5: *strongly agree*) to respond to the statements. We found the scale's reliability to be 0.904.

We also used Williams and Anderson (1991) 11-item scale to measure employees' OCB. A sample item was "Help colleagues in work-related matters," and was again rated on a five-point Likert scale. The scale's reliability was 0.929.

We assessed job-related affective well-being using Warr (1990) 12-item scale with questions such as "Think about the past few weeks, how much time did you experience each of the following feelings at work:' relaxed, enthusiastic, optimistic, cheerful, calm, contented, worried, depressed, gloomy, tense, miserable, and uneasy." Here we asked participants to use a five-point Likert-type scale (ranging from 1 = *never*, to 5 = *always*) to respond to positive statements and another five-point Likert scale (ranging from 1 = *always*, to 5 = *never*) for negative statements. The scales' reliability was 0.951.

Finally, we assessed moral identity using a five-item scale developed by Zhu (2008). A sample item was "I am willing to take a risk to be loyal to my moral values." Once again, we used a five-point Likert scale (ranging from 1: *strongly disagree*, to 5: *strongly agree*), with a reliability of 0.868.

Analysis strategy

Since employees were nested within their teams, we conducted a multi-level analysis, where we considered the team's ethical climate as a group-level variable. Furthermore, we considered the employees' OCB, affective well-being, and moral identity to be individual-level variables. Therefore, to confirm whether the data was suitable for multi-level analysis, we initially conducted null model testing using Mplus 8.3. An inter-class correlation coefficient (ICC) greater than 0.138 would mean that the degree of heterogeneity was high, and we could not ignore the variation of the dependent variable (Snijders and Bosker, 1999). The results of the null model test in this study showed that the ICC of OCB was 0.468, which means that, among the reasons for differences in employee OCB, 46.8% are due to differences in the ethical climate at the group-level (inter-group variation). The ICC of affective well-being was 0.446, indicating that differences in group-level

ethical climate were responsible for 44.6% of differences in employees' affective well-being (inter-group variation). Overall, these results proved the correctness and necessity of the multi-level analysis.

We then used Mplus 8.3 to perform a multi-level confirmatory factor analysis to evaluate the validity of the model construct and model fit indices. We used the following goodness of fit statistics to assess the model fitness: χ^2/DF = 1.279 (<3), CFI = 0.980 (>0.9), TLI = 0.978 (>0.9), RMSEA = 0.034 (<0.08), SRMR within =0.041 (<0.08), and SRMR between = 0.039 (<0.08). We also used composite reliability (CR), Cronbach's alpha, and average variance extracted (AVE) to confirm the constructs' validity and reliability. In addition, we also conducted a multi-level path analysis to test the hypotheses, again using Mplus 8.3. Although this research utilized multi-source data to test the hypotheses, we conducted the questionnaire survey over the same period. Thus, we used Harman (1976) one-factor test in this study to check the common method variance of the data. The unrotated factor solution revealed that one factor explains 28.89% of the variance, much less than the 50% threshold, implying that common method variance was not relevant in this research.

Data analysis and results

Preliminary analyses

As shown in Table 1, Cronbach's alpha values exceeded 0.70 (George and Mallery, 2003), which confirmed internal consistency for all variables. Likewise, the AVE values were above 0.50, and the CR values were above 0.70 (Hair et al., 1998). Thus, both the reliability and validity scores of the structure were acceptable.

Table 2 shows that all of the variables' standard deviations were within the normal range. In addition, the research variables showed a binary correlation in the expected direction, while the square root of the AVE values displayed on the diagonal line exceeded the value of the correlations, which proved the discriminant validity (Fornell and Larcker, 1981). Therefore, the study's data were suitable for further analysis.

Hypothesis tests

The study followed Baron and Kenny (1986) well-known methodology regarding the multi-level mediation effect by conducting four regressions to test mediating effects (Figure 2 depicts the basic causality). As shown in Table 3, the regression coefficient of ethical climate (group-level) and affective well-being (individual-level) is 0.503 ($p < 0.001$, Model 4). We also measured ethical climate and affective well-being using a five-point scale. A 1-point increase in ethical climate is associated with a 0.503-point increase in affective well-being. Therefore, this finding supports H_1. The regression coefficient for group-level ethical climate and individual-level OCB is 0.446 ($p < 0.001$, Model 1); a 1-point increase in ethical climate is associated with a 0.446-point increase in OCB, which supports H_2. H_3 proposed that individual-level OCB mediates the relationship between group-level ethical climate and individual-level employees' affective well-being. When we added the employees' OCB (mediator) into Model 5, the positive relationship between group ethical climate and employees' affective well-being decreased ($r = 0.212^*$), while employees' OCB was positively related to employees' affective well-being ($r = 0.651^{***}$). This demonstrated the partial mediation of employees' OCB and supported H_3.

To test the hypothesis of the moderating effect of moral identity, we referred to the literature regarding the use of Level 1 variables to moderate cross-level relationships (Miao et al., 2020; Saleem et al., 2020; Liang et al., 2021). We established a new interaction term (EC × MI) and entered it into the model. First, we added the moderating variable MI into Model 2 based on Model 1, but the results showed that MI had no significant effect on OCB ($r = -0.019$, $p > 0.05$). Then based on Model 3, we added an interaction term (EC × MI) to Model 4. However, the results showed that EC × MI had no significant effect on OCB, so this finding did not support H_4. Similarly, we based Model 7 on Model 6 and added an interaction term (EC × MI). The results showed that EC × MI had a significant positive effect on affective well-being ($r = 0.289^{**}$), supporting H_5. As shown in Figure 3, when an organization's ethical climate is strong, employees with high moral identity show a higher sense of affective well-being than employees with low moral identity. Interestingly, however, when an organization's ethical climate is weak, employees with low moral identity show a greater level of affective well-being than employees with high morality.

Robustness tests

This study used Mplus 8.3 for multi-level structural equation modeling to test the robustness of the results. We followed the recommendations of Preacher et al. (2010), decomposing individual-level variables (OCB and moral identity) into a within-level part and a between-level part when estimating multi-level mediation and moderation effects. For the multi-level mediation effects, we specified the fixed effects of OCB_{within} on individual affective well-being at Level 1. We also included the effects of ethical climate and $OCB_{between}$ on individual affective well-being at Level 2. For multi-level moderation effects (Preacher et al., 2016), we included the fixed effects of moral $identity_{within}$ on OCB and affective well-being at Level 1. At Level 2, we specified the effects of ethical climate, moral $identity_{between}$, and one fixed interaction term (i.e., ethical climate × moral $identity_{between}$) on OCB and affective well-being. Figure 4 shows the results of the hypotheses testing.

The direct effect of group-level ethical climate on individual-level affective well-being was 0.225, $p < 0.01$,

TABLE 1 Scale reliability and validity.

Variable	Items	Factor loading	Alpha	CR	AVE
Ethical climate	My work team has a formal, written code of ethics.	0.824	0.904	0.912	0.600
	My work team strictly enforces a code of ethics.	0.815			
	My work team has policies with regard to ethical behavior.	0.671			
	My work team strictly enforces policies regarding ethical behavior.	0.896			
	I make it clear to my work team that unethical behavior will not be tolerated.	0.749			
	If an employee in my team is discovered to have engaged in unethical behavior that results primarily in personal gain (rather than corporate gain), he or she will be promptly reprimanded.	0.622			
	If an employee in my team is discovered to have engaged in unethical behavior that results in primarily corporate gain (rather than personal gain), he or she will be promptly reprimanded.	0.809			
OCB	I endeavor to keep the workplace clean and neat.	0.693	0.929	0.930	0.550
	I participate in activities organized by employee groups.	0.781			
	I make constructive suggestions.	0.678			
	I help co-workers in non-work matters.	0.820			
	I save company resources.	0.864			
	I help colleagues in work-related matters.	0.686			
	I maintain harmonious relationships and defuse conflict.	0.738			
	I prohibit behavior harmful to the organization.	0.758			
	I share useful work-related information.	0.708			
	I participate in company-organized group activities.	0.712			
	I defend the company against disasters.	0.694			
Moral identity	I view being an ethical person as an important part of who I am.	0.699	0.868	0.873	0.580
	I am committed to my moral principles.	0.787			
	I am determined to behave consistently with my moral ideals or principles.	0.865			
	I am willing to take a risk to be loyal to my moral values.	0.695			
	I am willing to place the collective interest over my own personal ego and interest.	0.748			
Affective well-being	Relaxed	0.696	0.951	0.952	0.626
	Enthusiastic	0.847			
	Cheerful	0.86			
	Calm	0.849			
	Contented	0.815			
	Optimistic	0.809			
	Worried	0.718			
	Depressed	0.768			
	Gloomy	0.777			
	Tense	0.792			
	Miserable	0.765			
	Uneasy	0.778			

Alpha, Cronbach's alpha; AVE, average variance extracted; CR, composite reliability; OCB, organizational citizenship behavior.

supporting H_1. The effect of group-level ethical climate on individual-level OCB was 0.468, $p < 0.001$, supporting H_2. H_3 proposed that individual-level OCB mediates the relationship between group-level ethical climate and individual-level employees' affective well-being. The results indicated a statistically significant positive mediation effect (EC → OCB → AW) of 0.306 (0.468×0.654), $p < 0.001$. After adding individual-level OCB, the effect of group-level ethical climate on individual-level affective well-being was 0.225, still reaching a significant level at 0.01. This finding indicated that OCB was a partial mediation variable, and the total effect of group-level ethical climate on individual-level affective well-being was 0.531 ($0.306 + 0.225$). Therefore, this result supports H_3. In addition, H_4 and H_5, respectively, state that moral identity moderates the effect of ethical climate on OCB and moderates the effect of ethical climate on affective well-being. The results showed that the interaction term (ethical climate × moral identity) is not significantly related to OCB ($p > 0.05$), thereby rejecting H_4. However, the interaction term of ethical climate and moral identity was positively and significantly

related to affective well-being (0.262, $p < 0.001$). When employees' moral identity was high, the ethical climate had a greater impact on employees' affective well-being, meaning that this result supports H_5.

Discussion

This research explored the multi-level mechanism of the relationship between ethical climate (group-level) and affective well-being (individual-level) mediated by OCB at the individual-level. The model was also enriched by the moderation of moral identity (individual-level). Based on the results of empirical analysis, the main conclusions of this research are as follows. First, the group-level ethical climate has a significantly positive effect on individual-level affective well-being. Second, the group-level ethical climate has a significantly positive impact on individual-level OCB. Third, individual-level OCB partially mediates the relationship between ethical climate (group-level) and affective well-being (individual-level). Fourth, moral identity has a positive moderating effect on the relationship between ethical climate (group-level) and affective well-being (individual-level). Having a high moral identity strengthens the relationship between ethical climate and affective well-being. However, moral identity did not play a significant moderating role between ethical climate and OCB in this study. We also divided the millennial employees into two age groups (20–30 and 30–40) for additional comparison. The results showed that in the 20–30 age group, the ethical climate has a stronger positive impact on the employees' affective well-being (0.227**) and OCB (0.694***), while the ethical climate has a slightly weaker positive impact on the affective well-being (0.155**) and OCB (0.626***) of the employees in the 30–40 age group. We can assume, therefore, that younger millennials (i.e., those in the 20–30 age group) may be more sensitive to ethical issues in the workplace. Managers should pay attention to the differences between different age groups of millennials.

TABLE 2 Correlation matrix of the study's variables.

Variable	Mean	SD	1	2	3	4
Ethical climate	3.577	0.788	(0.775)			
Affective well-being	3.419	0.863	0.464**	(0.791)		
OCB	3.763	0.733	0.480**	0.647**	(0.742)	
Moral identity	3.698	0.779	0.170**	0.182**	0.154*	(0.762)

**$p < 0.01$; *$p < 0.05$.
Square root of AVE was on the diagonal.

Theoretical implications

First of all, this study considered the ethical climate as an organizational variable by asking the team leader to evaluate the ethical climate of their team. The results showed that ethical climate is an effective predictor of both OCB and affective well-being. These findings are consistent with the argument suggested in previous literature that employees' unique perceptions of their work environment and their shared common perceptions of the work environment (i.e., the organizational climate) can influence their job attitudes and behaviors (Wang and Hsieh, 2012).

Second, this study extends the literature and research on employee affective well-being in the workplace. Previous research has focused more on the impact of ethical leadership on employees' affective well-being (Ahmad, 2019; Kaffashpoor and Sadeghian, 2020). However, ethics is a group-level phenomenon that can shape an organization's internal relations and employee attitudes through ethical climates (Naber and Moffett, 2017). Therefore, the ethical climate is also one of the main factors shaping the organization's internal relations and employee attitudes. The results of this study provide empirical support for the SST, responding to Newman et al. (2017) call for future

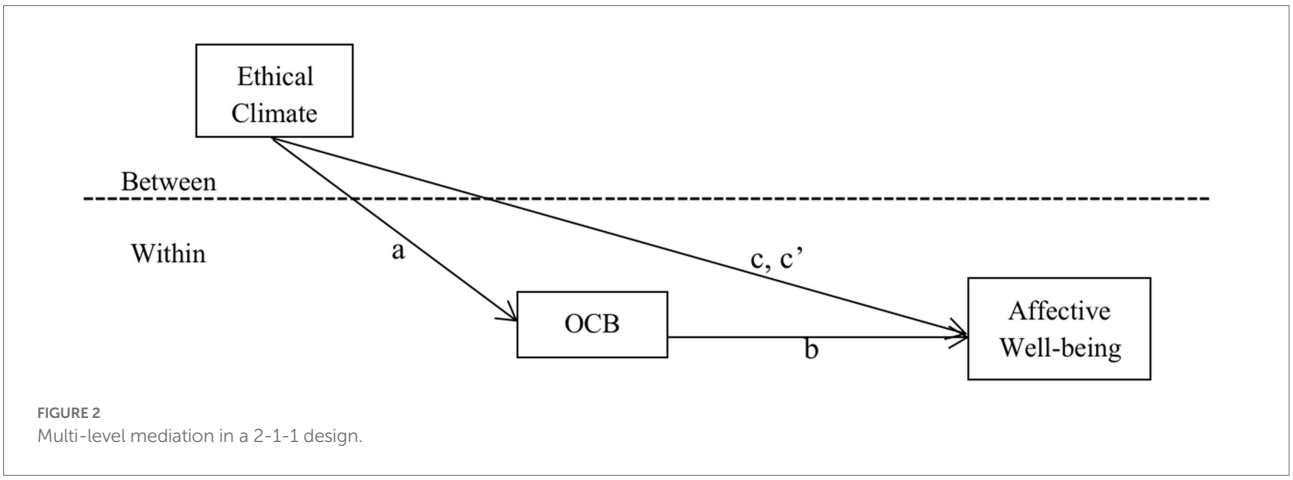

FIGURE 2
Multi-level mediation in a 2-1-1 design.

TABLE 3 Regression analysis for hypothesis: model summary.

Level and variables	OCB				Affective well-being				
	Null model 1	Model 1	Model 2	Model 3	Null model 2	Model 4	Model 5	Model 6	Model 7
Level 2									
EC		0.446***	0.447***	0.446***		0.503***	0.212*	0.503***	0.503***
Level 1									
MI			−0.019	−0.023				−0.016	−0.018
OCB							0.651***		
Cross-Level									
EC × MI				−0.011					0.289**
Individual-level variance (σ2)	0.285	0.285	0.286	0.287	0.407	0.406	0.287	0.409	0.391
Group-level variance (τ)	0.258	0.135	0.135	0.135	0.337	0.183	0.129	0.183	0.185
Chi-square	257.418***	150.199***	149.844***	148.878***	243.835***	146.568***	146.285***	145.892***	152.348***
Deviance	468.032	451.708	453.260	458.567	553.312	537.901	452.515	539.391	534.251

$N_{level1} = 248$; $N_{level2} = 40$. Deviance is a measure of model fit; the smaller it is, the better the model fits. EC, Ethical climate; OCB, Organizational citizenship behavior; AW, Affective well-being; MI, moral identity. *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

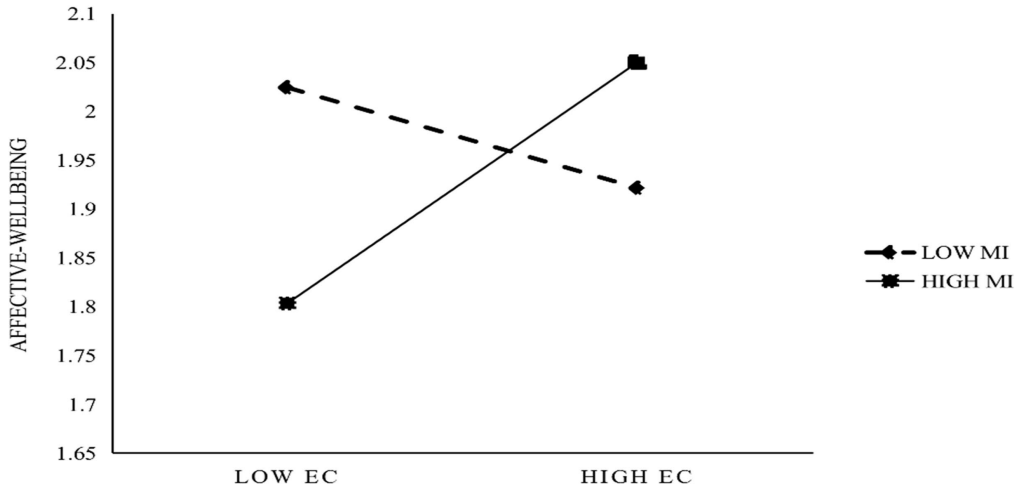

FIGURE 3
Moderation of moral identity in ethical climate and affective well-being.

research to use SST to expand our understanding of ethical climate. In particular, millennial employees who emphasize their ethical values can feel more value congruence in an organization with an ethical climate, which further boosts their affective well-being.

Third, the present findings show that OCB has a significant mediating impact on the relationship between ethical climate and affective well-being. This research conducted an in-depth study of the relationship between OCB and affective well-being, challenging the previous assumption that positive affective well-being predicts OCB. That is, OCB can also promote positive emotional experiences. This conclusion is consistent with the research results of Lam et al. (2016). Moreover, previous studies analyzed OCB from a resource consumption perspective and indicated that OCB consumes resources and thus brings negative emotions. This research indicates that OCB can also bring resources and positive emotions to people from a resource enrichment perspective. Positive psychology posits that positive and negative emotions can co-exist, and cannot be viewed as a dichotomy.

Fourth, the ethical climate can further enhance the job-related affective well-being of employees with strong moral identities.

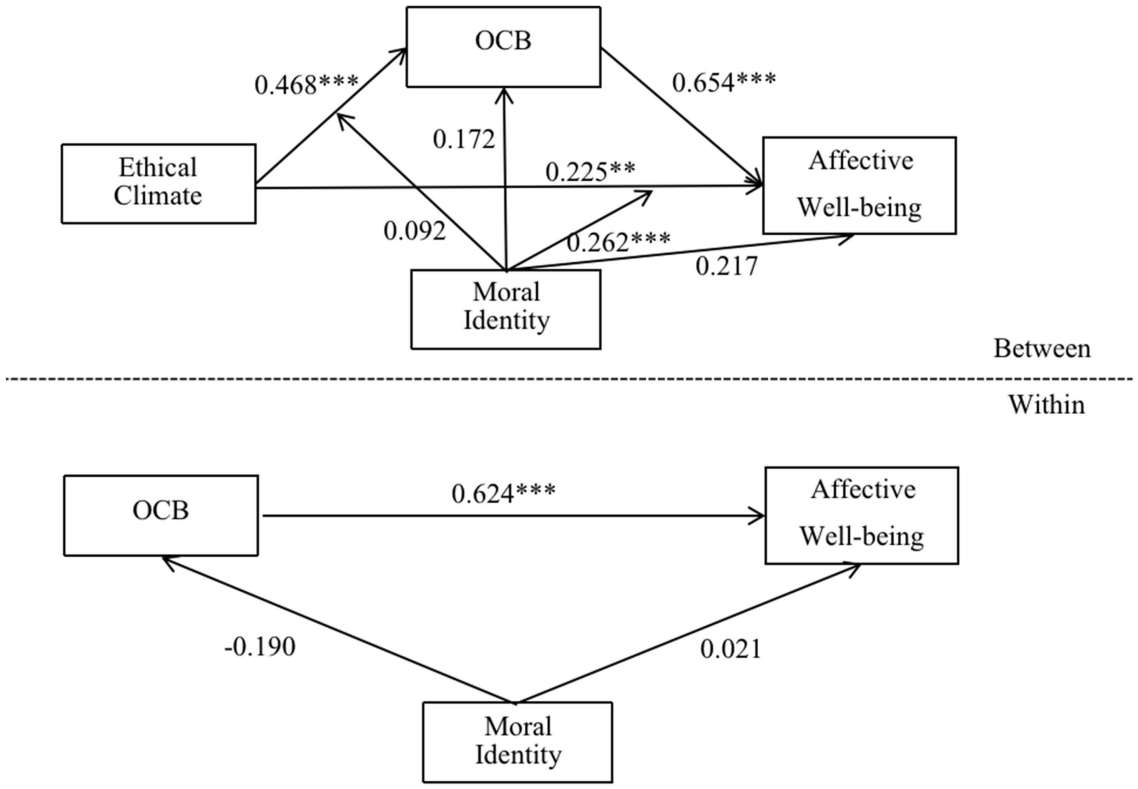

FIGURE 4
Robustness test: multi-level structural equation modeling (MSEM). ***p<0.001; **p<0.01.

Employees who have similar values to their organization will have higher levels of affective well-being. This study verifies the moderating role of moral identity between ethical climate and affective well-being for the first time and provides empirical evidence for the P-O fit theory. Employees with a higher level of moral identity are happier in organizations with a good ethical climate. Interestingly, however, employees with low moral identity experience greater levels of affective well-being in organizations with a weaker ethical climate. When employees' values and beliefs are in line with their organization, they can experience more positive emotions—a finding which is consistent with Al Halbusi et al. (2020) results.

Chuang and Chiu (2018) found that employees' moral personalities positively moderated the relationship between ethical leadership and OCB. However, this study found that moral identity did not have a significant moderating effect between ethical climate and OCB. This may be a result of China's cultural characteristics, since China has a collectivist culture whereby the organizational climate is more likely to affect the individuals (Wang et al., 2019). Therefore, even if employees have a low moral identity, they will be more affected by the organizational climate and more likely to adopt OCB in a collectivist culture. In addition, according to SLT, people will imitate and learn from their surrounding environment. Therefore, even employees with low moral identity can begin to imitate and learn the moral cues in their organization and demonstrate more pro-social behaviors if they are immersed in a strong ethical climate.

Practical implications

First of all, HR departments should develop, clear written ethics rules outlining acceptable and unacceptable behaviors. The departments should then train or distribute information about ethics policies to employees to form common ethical values among members of the team/organization (Dinc and Aydemir, 2014). HR should also monitor ethical behaviors and investigate ethical/unethical situations since there must be a supporting reward and punishment system to reward employees for ethical behavior and sanction those who demonstrate unethical behavior. HR can increase ethical behavior by acting as an ethical role model. For millennial employees who emphasize ethics, working in a team with a strong ethical climate aligns with their ethical values and can improve their affective well-being. The COVID-19 pandemic has quickened the trend toward "working from anywhere." In order to reduce unethical issues within a team when not directly supervised, much more needs to be done to address the ethical and compliance problems that will be pervasive in

this new working environment. Therefore, it is crucial to regularly assess the ethical climate in an organization so that employees can share and discuss their perceptions (Pagliaro et al., 2018). Ethics can seem an abstract concept, but it really depends on employees' honest and open communication with their team and with their manager.

Second, given the positive benefits of OCB, the HR department should encourage employees to demonstrate OCB through training to help new employees to socialize and integrate into the organizational environment. Through OCB, millennials can realize the value of helping others, gain more sense of work meaning, and increase their happiness levels. However, considering that OCB also has a "dark side," the organization should give employees the discretion to engage in OCB (Kaur and Kang, 2019).

Third, the HR department can strengthen the moral identity of employees through training. It should ensure that the organization's training program constantly instructs employees on the importance of developing ethical personalities and guides them to make ethical decisions and take appropriate actions (Chuang and Chiu, 2018). Organizations could also attempt to select employees higher in moral identity using personnel selection tools and processes (Wang et al., 2019). For example, they could conduct a situational interview to observe a candidate's ethical decision-making when in an ethical dilemma.

Limitations and future directions

This study first examined the impact of ethical climate and OCB on affective well-being from a holistic perspective. Based on the empirical results of this study, further research could explore the impact of various dimensions of ethical climate and OCB on affective well-being. Second, in order to better compare millennials with other generations, future research could adopt experimental designs dividing participants into two groups [e.g., a treatment group (millennials) and a control group (other generations)] to test relationships. We believe that the relationship between ethical climate and the well-being of millennials will be stronger than it is for other generations. Third, we conducted this research in China, which has a relatively homogenous culture. As mentioned earlier, China is a collectivist society, and the organizational culture is more likely to affect individuals. In more individualistically minded cultures, we believe that individuals may have a stronger sense of their own moral identity. In other words, compared with people with low moral identity, people with high moral identity will participate in more OCBs. Therefore, future research should test these possible cross-cultural differences and re-examine this research topic with millennial employees in other countries/regions to compare whether there are differences across cultures/regions; the empirical results of this study can be used as a comparative sample. In addition, the moderating effect of moral identity may also differ between different industries. For example, in industries with a high degree of teleworking, employees with a high moral identity will still demonstrate ethical behavior and "do the right thing, at the right time," even if no one is watching. Therefore future studies can also add sector/industry characteristics to expand this research. Finally, future research can combine an organization's ethical culture construction, a team/department's ethical climate, and employees' attitudes and behaviors to conduct three-level research.

Conclusion

An important issue of human resource management is to build an organizational climate/culture that is recognized by employees within the organization. Also, with the development of positive psychology, employee affective well-being in the workplace is becoming the central topic of HRM research. Millennials have unique expectations, attitudes, and values in comparison to previous generations. They pay more attention to their well-being and their experiences of positive emotions in the workplace. Ethics are very important to millennials and are a core part of their values, meaning that they value clear ethical expectations and rules in an organization. In this study, we attempted to clarify whether millennials experience more affective well-being in organizations with a strong ethical climate that aligns with their values. A multi-level mechanism encompassing SST, social information processing theory, SLT, COR theory, and P-O fit was used to develop a model that measured the main effect of ethical climate, the mediating effect of OCB, and the moderating impact of moral identity. We found that ethical climate is a significant predictor of the affective well-being and OCB of millennial employees and that moral identity plays a partially moderated role. Previous research focused on the impact of ethical leadership, and the results of this study showed that ethical climate is also one of the main factors shaping its internal relations and the attitude of employees. Our research also indicates that OCB can also bring resources and positive emotions to people from a resource enrichment perspective. In terms of moderating the role of moral identity, it is interesting to note that employees with lower moral identity experience higher levels of affective well-being in organizations with a weak ethical climate. When employees' values and beliefs are in line with the organization, they can experience more positive emotions, which provides empirical evidence for the P-O value fit. In summary, we encourage organizations to develop clearly written codes of ethics, regularly assess the ethical climate in their workplace, and strengthen an employee's OCB and moral identity through constant training. Ultimately, if these measures are followed, they will significantly boost the affective well-being of millennial employees.

Data availability statement

The raw data supporting the conclusions of this article will be available on request to the corresponding author.

Ethics statement

Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

Author contributions

WS and JH contributed to conceptualization, formal analysis, investigation, methodology, and writing and editing the original draft. 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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References

According to Ernst and Young's (2017). Asia-Pacific Fraud Survey Report (source: https://assets.ey.com/content/dam/ey-sites/ey-com/en_gl/topics/assurance/assurance-pdfs/ey-asia-pacific-fraud-survey-2017.pdf), more than 80% of millennials.

Agrawal, R. K. (2017). Do ethical climates impact trust in management? A study in Indian context. *Int. J. Organ. Anal.* 25, 804–824. doi: 10.1108/IJOA-08-2016-1053

Ahmad, M. A. (2019). The effect of ethical leadership on management accountants' performance: the mediating role of psychological well-being. *Probl. Perspect. Manag.* 17:228, –241. doi: 10.21511/ppm.17(2).2019.17

Al Halbusi, H., Williams, K. A., Ramayah, T., Aldieri, L., and Vinci, C. P. (2020). Linking ethical leadership and ethical climate to employees' ethical behavior: the moderating role of person–organization fit. *Pers. Rev.* 50, 159–185. doi: 10.1108/PR-09-2019-0522

Aloustani, S., Atashzadeh-Shoorideh, F., Zagheri-Tafreshi, M., Nasiri, M., Barkhordari-Sharifabad, M., and Skerrett, V. (2020). Association between ethical leadership, ethical climate and organizational citizenship behavior from nurses' perspective: a descriptive correlational study. *BMC Nurs.* 19, 15–18. doi: 10.1186/s12912-020-0408-1

Aquino, K., and Reed, A. II. (2002). The self-importance of moral identity. *J. Pers. Soc. Psychol.* 83, 1423–1440. doi: 10.1037/0022-3514.83.6.1423

Badri, S. K. Z., Yap, W. M., and Ramos, H. M. (2022). Workplace affective well-being: gratitude and friendship in helping millennials to thrive at work. *Int. J. Organ. Anal.* 30, 479–498. doi: 10.1108/IJOA-04-2020-2148

Bagozzi, R. P., Baumgartner, H., Pieters, R., and Zeelenberg, M. (2003). "The role of emotions in goal-directed behavior," in *The why of consumption*. (Routledge), 36–58.

Bai, Y., Lin, L., and Liu, J. T. (2019). Leveraging the employee voice: a multi-level social learning perspective of ethical leadership. *Int. J. Hum. Resour. Manag.* 30, 1869–1901. doi: 10.1080/09585192.2017.1308414

Baranik, L. E., and Eby, L. (2016). Organizational citizenship behaviors and employee depressed mood, burnout, and satisfaction with health and life: the mediating role of positive affect. *Pers. Rev.* 45, 626–642. doi: 10.1108/PR-03-2014-0066

Baron, R. M., and Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *J. Pers. Soc. Psychol.* 51, 1173–1182. doi: 10.1037//0022-3514.51.6.1173

Bowen, S. A. (2010). Almost a decade later: have we learned lessons from inside the crooked E Enron. *Ethic. Space Int. J. Comm. Ethics* 7, 28–35.

Brant, K. K., and Castro, S. L. (2019). You can't ignore millennials: needed changes and a new way forward in entitlement research. *Hum. Resour. Manag. J.* 29, 527–538. doi: 10.1111/1748-8583.12262

Çavuş, M. F., and Develi, A. (2017). Ethical climate and organizational citizenship behaviour. *Int. J. Hum. Resour. Stud.* 7, 38–51. doi: 10.5296/ijhrs.v7i1.10561

Chatman, J. A. (1989). Improving interactional organizational research: A model of person-organization fit. *Acad. Manage. Rev.* 14, 333–349. doi: 10.5465/amr.1989.4279063

Chen, X., Wei, S., and Rice, R. E. (2020). Integrating the bright and dark sides of communication visibility for knowledge management and creativity: the moderating role of regulatory focus. *Comput. Hum. Behav.* 111:106421. doi: 10.1016/j.chb.2020.106421

Chuang, P. J., and Chiu, S. F. (2018). When moral personality and moral ideology meet ethical leadership: A three-way interaction model. *Ethics Behav.* 28, 45–69. doi: 10.1080/10508422.2016.1229604

Chuang, A., Shen, C. T., and Judge, T. A. (2016). Development of a multidimensional instrument of person–environment fit: the perceived person–environment fit scale (PPEFS). *Appl. Psychol.* 65, 66–98. doi: 10.1111/apps.12036

Contreras-Pacheco, O. E., Vecino-Arenas, C. E., and Lesmez-Peralta, J. C. (2021). Correlating affective commitment with Prosocial behavior: does perceived meaningfulness at work matter? *Cuad de Adm.* 36, 112–125. doi: 10.25100/cdea.v36i68.9639

Curtin, P. A., Gallicano, T., and Matthews, K. (2011). Millennials' approaches to ethical decision making: A survey of young public relations agency employees. Pub. *Relations J.* 5, 1–22.

De Clercq, D., Haq, I. U., and Azeem, M. U. (2019). Role ambiguity and perceptions of unfair performance appraisals: mitigating roles of personal resources. *Asia Pac. J. Hum. Resour.* 57, 150–173. doi: 10.1111/1744-7941.12178

Dinc, M. S., and Aydemir, M. (2014). Ethical leadership and employee behaviours: an empirical study of mediating factors. *Int. J. Bus. Gov. Ethics* 9, 293–312. doi: 10.1504/IJBGE.2014.064738

Domino, M. A., Wingreen, S. C., and Blanton, J. E. (2015). Social cognitive theory: the antecedents and effects of ethical climate fit on organizational attitudes of corporate accounting professionals—a reflection of client narcissism and fraud attitude risk. *J. Bus. Ethics* 131, 453–467. doi: 10.1007/s10551-014-2210-z

Fassina, N. E., Jones, D. A., and Uggerslev, K. L. (2008). Relationship clean-up time: using meta-analysis and path analysis to clarify relationships among job satisfaction, perceived fairness, and citizenship behaviors. *J. Manage* 34, 161–188. doi: 10.1177/0149206307309260

Fatima, T. A., and Siddiqui, D. A. (2020). Ethical leadership and organizational citizenship behaviour: the mediating role of ethical climate, trust, and justice. *Int. J. Hum. Resour. Stud.* 10, 70–103. doi: 10.5296/ijhrs.v10i1.15954

Fornell, C., and Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *J. Market. Res.* 18, 39–50. doi: 10.1177/002224378101800104

García, G. A., Gonzales-Miranda, D. R., Gallo, O., and Roman-Calderon, J. P. (2019). Employee involvement and job satisfaction: A tale of the millennial generation. *Empl. Relat.* 41, 374–388. doi: 10.1108/ER-04-2018-0100

Ge, Y. (2018). Supervisor bottom-line mentality, instrumentalism ethical climate and Employee's unethical behavior: the moderate effect of moral identity. In 2018 2nd international conference on education, economics and management research (ICEEMR 2018) (pp. 766–772). Atlantis Press.

George, D., and Mallery, P. (2003). *SPSS for windows step by step: A simple guide and reference. 11.0 update* (*4th edtn.*). Boston: Allyn & Bacon.

Gerpott, F. H., Van Quaquebeke, N., Schlamp, S., and Voelpel, S. C. (2019). An identity perspective on ethical leadership to explain organizational citizenship behavior: the interplay of follower moral identity and leader group prototypicality. *J. Bus. Ethics* 156, 1063–1078. doi: 10.1007/s10551-017-3625-0

Guo, Q., Wu, R., and Li, X. (2018). Beneficial effects of pro-social behaviour on physical well-being in Chinese samples. *Asian J. Soc. Psychol.* 21, 22–31. doi: 10.1111/ajsp.12193

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., and Tatham, R. L. (1998). *Multivariate Data Analysis*. Upper Saddle River, NJ: Prentice Hall.

Hannah, S. T., Avolio, B. J., and May, D. R. (2011). Moral maturation and moral conation: A capacity approach to explaining moral thought and action. *Acad. Manage. Rev.* 36, 663–685. doi: 10.5465/amr.2010.0128

Harman, H. H. (1976). *Modern factor analysis. 3rd Edtn*. The University of Chicago Press, Chicago.

He, J., Morrison, A. M., and Zhang, H. (2019). Improving millennial employee well-being and task performance in the hospitality industry: the interactive effects of HRM and responsible leadership. *Sustainability* 11:4410. doi: 10.3390/su11164410

Heffernan, M., and Dundon, T. (2016). Cross-level effects of high-performance work systems (HPWS) and employee well-being: the mediating effect of organisational justice. *Hum. Resour. Manag. J.* 26, 211–231. doi: 10.1111/1748-8583.12095

Hsieh, H. H., and Wang, Y. D. (2016). Linking perceived ethical climate to organizational deviance: the cognitive, affective, and attitudinal mechanisms. *J. Bus. Res.* 69, 3600–3608. doi: 10.1016/j.jbusres.2016.01.001

Huhtala, M., Kaptein, M., and Feldt, T. (2016). How perceived changes in the ethical culture of organizations influence the well-being of managers: A two-year longitudinal study. *Eur. J. Work Organ. Psy.* 25, 335–352. doi: 10.1080/1359432X.2015.1068761

Jennings, P. L., Mitchell, M. S., and Hannah, S. T. (2015). The moral self: A review and integration of the literature. *J. Organ. Behav.* 36, S104–S168. doi: 10.1002/job.1919

Kaffashpoor, A., and Sadeghian, S. (2020). The effect of ethical leadership on subjective wellbeing, given the moderator job satisfaction (a case study of private hospitals in Mashhad). *BMC Nurs.* 19, 111–118. doi: 10.1186/s12912-020-00496-w

Kaur, N., and Kang, L. S. (2019). The costs and benefits of going beyond the call of duty. *Int. J. Product. Perform. Manag.* 69, 252–270. doi: 10.1108/IJPPM-01-2019-0035

Kerulis, A. M. (2018). *Does meaningfulness of work matter in the relationships between OCB and vigor, subjective well-being, and job satisfaction?* Hofstra University, ProQuest Dissertations Publishing.

Kurpis, L. V., Beqiri, M. S., and Helgeson, J. G. (2008). The effects of commitment to moral self-improvement and religiosity on ethics of business students. *J. Bus. Ethics* 80, 447–463. doi: 10.1007/s10551-007-9430-4

Lam, C. F., Wan, W. H., and Roussin, C. J. (2016). Going the extra mile and feeling energized: an enrichment perspective of organizational citizenship behaviors. *J. Appl. Psychol.* 101, 379–391. doi: 10.1037/apl0000071

Lazarus, R. S. (1991). Cognition and motivation in emotion. *Am. Psychol.* 46, 352–367. doi: 10.1037/0003-066X.46.4.352

Lease, S. H., Ingram, C. L., and Brown, E. L. (2019). Stress and health outcomes: do meaningful work and physical activity help. *J. Career Dev.* 46, 251–264. doi: 10.1177/0894845317741370

Lee, S. H., and Ha-Brookshire, J. (2018). The effect of ethical climate and employees' organizational citizenship behavior on US fashion retail organizations' sustainability performance. *Corp. Soc. Respon. Environ. Manag.* 25, 939–947. doi: 10.1002/csr.1510

Liang, B., van Knippenberg, D., and Gu, Q. (2021). A cross-level model of shared leadership, meaning, and individual creativity. *J. Organ. Behav.* 42, 68–83. doi: 10.1002/job.2494

Low, G. S., Cravens, D. W., Grant, K., and Moncrief, W. C. (2001). Antecedents and consequences of salesperson burnout. *Eur. J. Mark.* 35, 587–611. doi: 10.1108/03090560110388123

Martin, K. D., and Cullen, J. B. (2006). Continuities and extensions of ethical climate theory: A meta-analytic review. *J. Bus. Ethics* 69, 175–194. doi: 10.1007/s10551-006-9084-7

Mayer, D. M., Kuenzi, M., and Greenbaum, R. L. (2010). Examining the link between ethical leadership and employee misconduct: the mediating role of ethical climate. *J. Bus. Ethics* 95, 7–16. doi: 10.1007/s10551-011-0794-0

McCulloch, M. C., and Turban, D. B. (2007). Using person–organization fit to select employees for high-turnover jobs. *Int. J. Sel. Assess.* 15, 63–71. doi: 10.1111/j.1468-2389.2007.00368.x

Merecz, D., and Andysz, A. (2012). Relationship between person-organization fit and objective and subjective health status (person-organization fit and health). *Int. J. Occup. Med. Environ. Health* 25, 166–177. doi: 10.2478/S13382-012-0020-z

Meyer, R. D., Dalal, R. S., and Hermida, R. (2010). A review and synthesis of situational strength in the organizational sciences. *J. Manage.* 36, 121–140. doi: 10.1177/0149206309349309

Miao, R., Lu, L., Cao, Y., and Du, Q. (2020). The high-performance work system, employee voice, and innovative behavior: The moderating role of psychological safety. *Int. J. Environ. Res. Publ. Health* 17:1150. doi: 10.3390/ijerph17041150

Naber, A. M., and Moffett, R. G. III (2017). Follower moral reasoning influences perceptions of transformational leadership behavior. *J. Appl. Soc. Psychol.* 47, 99–112. doi: 10.1111/jasp.12427

Naz, U., Tasneem, S. S., Jabeen, R., and Saleem, R. (2019). The effects of ethical climate on bullying behavior in the workplace. *Int. J. Acad. Res.* 9, 1157–1170. doi: 10.6007/IJARBSS/v9-i3/5776

Newman, A., Round, H., Bhattacharya, S., and Roy, A. (2017). Ethical climates in organizations: A review and research agenda. *Bus. Ethics Q.* 27, 475–512. doi: 10.1017/beq.2017.23

Organ, D. W. (1997). Organizational citizenship behavior: It's construct clean-up time. *Hum. Perform.* 10, 85–97. doi: 10.1207/s15327043hup1002_2

Pagliaro, S., Lo Presti, A., Barattucci, M., Giannella, V. A., and Barreto, M. (2018). On the effects of ethical climate (s) on employees' behavior: A social identity approach. *Front. Psychol.* 9:960. doi: 10.3389/fpsyg.2018.00960

Podsakoff, P. M., MacKenzie, S. B., Paine, J. B., and Bachrach, D. G. (2000). Organizational citizenship behaviors: A critical review of the theoretical and empirical literature and suggestions for future research. *J. Manage.* 26, 513–563. doi: 10.1016/S0149-2063(00)00047-7

Preacher, K. J., Zhang, Z., and Zyphur, M. J. (2016). Multilevel structural equation models for assessing moderation within and across levels of analysis. *Psychol. Methods* 21, 189–205. doi: 10.1037/met0000052

Preacher, K. J., Zyphur, M. J., and Zhang, Z. (2010). A general multilevel SEM framework for assessing multilevel mediation. *Psychol. Methods* 15, 209–233. doi: 10.1037/a0020141

Qualls, W. J., and Puto, C. P. (1989). Organizational climate and decision framing: an integrated approach to analyzing industrial buying decisions. *J. Mark. Re.* 26, 179–192.

Rosso, B. D., Dekas, K. H., and Wrzesniewski, A. (2010). On the meaning of work: A theoretical integration and review. *Res. Organ. Behav.* 30, 91–127. doi: 10.1016/j.riob.2010.09.001

Salancik, G. R., and Pfeffer, J. (1978). A social information processing approach to job attitudes and task design. *Adm. Sci. Q.* 23, 224–253. doi: 10.2307/2392563

Saleem, M., Qadeer, F., Mahmood, F., Ariza-Montes, A., and Han, H. (2020). Ethical leadership and employee green behavior: a multilevel moderated mediation analysis. *Sustainability* 12:3314. doi: 10.3390/su12083314

Schwepker, C. H. Jr. (2001). Ethical climate's relationship to job satisfaction, organizational commitment, and turnover intention in the salesforce. *J. Bus. Res.* 54, 39–52. doi: 10.1016/S0148-2963(00)00125-9

Sendjaya, S., Eva, N., Robin, M., Sugianto, L., ButarButar, I., and Hartel, C. (2019). Leading others to go beyond the call of duty: A dyadic study of servant leadership and psychological ethical climate. *Pers. Rev.* 49, 620–635. doi: 10.1108/PR-08-2018-0285

Snell, R. S., Tjosvold, D., and Wu, J. L. (2010). Clarity of ethical rules for open-minded discussion to resolve ethical issues in Chinese organizations. *Asia Pac. J. Hum. Resour.* 48, 185–211. doi: 10.1177/1038411110368466

Snijders, T., and Bosker, R. (1999). *Multilevel analysis: An introduction to basic and advanced multilevel modeling*. London: Sage Publishers.

Sparks, J. R. (2015). A social cognitive explanation of situational and individual effects on moral sensitivity. *J. Appl. Soc. Psychol.* 45, 45–54. doi: 10.1111/jasp.12274

Teng, C. C., Lu, A. C. C., Huang, Z. Y., and Fang, C. H. (2020). Ethical work climate, organizational identification, leader-member-exchange (LMX) and organizational citizenship behavior (OCB): a study of three-star hotels in Taiwan. *Int. J. Contemp. Hosp. Manag.* 32, 212–229. doi: 10.1108/IJCHM-07-2018-0563

Teresi, M., Pietroni, D. D., Barattucci, M., Rev, G., and Pagliaro, S. (2019). Ethical climate (s), organizational identification, and employees' behavior. *Front. Psychol.* 10:1356. doi: 10.3389/fpsyg.2019.01356

VanMeter, R. A., Grisaffe, D. B., Chonko, L. B., and Roberts, J. A. (2013). Generation Y's ethical ideology and its potential workplace implications. *J. Bus. Ethics* 117, 93–109. doi: 10.1007/s10551-012-1505-1

Wang, Y. D., and Hsieh, H. H. (2012). Toward a better understanding of the link between ethical climate and job satisfaction: A multilevel analysis. *J. Bus. Ethics* 105, 535–545. doi: 10.1007/s10551-011-0984-9

Wang, Z., Xing, L., Xu, H., and Hannah, S. T. (2019). Not all followers socially learn from ethical leaders: the roles of followers' moral identity and leader identification in the ethical leadership process. *J. Bus. Ethics* 170, 449–469. doi: 10.1007/s10551-019-04353-y

Warr, P. (1990). The measurement of well-being and other aspects of mental health. *J. Occup. Psychol.* 63, 193–210. doi: 10.1111/j.2044-8325.1990.tb00521.x

Wijewardena, N., Samaratunge, R., and Härtel, C. (2014). Creating better employees through positive leadership behavior in the public sector. *Int. J. Public Adm.* 37, 88–298. doi: 10.1080/01900692.2013.835320

Williams, L. J., and Anderson, S. E. (1991). Job satisfaction and organizational commitment as predictors of organizational citizenship and in-role behaviors. *J. Manage.* 17, 601–617. doi: 10.1177/014920639101700305

Wu, T. J., Gao, J. Y., Wang, L. Y., and Yuan, K. S. (2020). Exploring links between polychronicity and job performance from the person–environment fit perspective—the mediating role of well-being. *Int. J. Environ. Res. Public Health* 17:3711. doi: 10.3390/ijerph17103711

Yang, C. (2014). Does ethical leadership lead to happy workers? A study on the impact of ethical leadership, subjective well-being, and life happiness in the Chinese culture. *J. Bus. Ethics* 123, 513–525. doi: 10.1007/s10551-013-1852-

Yuniasanti, R., Abas, N. A. H., and Hamzah, H. (2019). Employee turnover intention among millennials: the role of psychological well-being and experienced workplace incivility. *HUMANITAS: Indones. Psychol. J.* 16, 74–85. doi: 10.26555/humanitas.v16i2.12544

Zhou, L., Liu, Y., Chen, Z., and Zhao, S. (2018). Psychological mechanisms linking ethical climate to employee whistle-blowing intention. *J. Manag. Psychol.* 33, 196–213. doi: 10.1108/JMP-09-2017-0292

Zhu, W. (2008). The effect of ethical leadership on follower moral identity: the mediating role of psychological empowerment. *Leadersh. Rev.* 8, 62–73.

Zhu, W., Riggio, R. E., Avolio, B. J., and Sosik, J. J. (2011). The effect of leadership on follower moral identity: does transformational/transactional style make a difference? *J. Leadersh. Organ. Stud.* 18, 150–163. doi: 10.1177/1548051810396714

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Digitalization and digital transformation in higher education: A bibliometric analysis

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The new paradigms that are emerging because of technological and social advances derived from the massive use of information and communication technologies (ICTs) are generating a transformative process that is modifying all economic sectors, and education is no exception. Higher Education Institutions (HEIs) are carrying out such transformation, reacting to the need of adaptation to this new reality, experiencing a complete cultural change that is challenging the attitudes, actions and values shared by the members and stakeholders of these organizations. In order to analyze the scientific literature about this topic, a bibliometric analysis has been carried out covering the period 1900–2021, considering a sample of 469 articles included in the Web of Science (WoS) database. The results show the multidisciplinary nature of the topic, including articles published in different areas, as well as its close link with aspects such as innovation, governance and agile methodologies. Finally, this study highlights the main lines of research that could attract more attention in the immediate future.

KEYWORDS

digitalization, digital transformation, cultural change, bibliometric analysis, resistance to change, research trends, higher education institutions

Introduction

In the last years, the unstoppable development of information and communication technologies (ICTs) has given birth to what has been called the digital age or Industry 4.0. These technological advances are dramatically changing most fields of our day to day lives, as well as the dynamics of social and economic relations. The academic literature has often called this phenomenon *Fourth Industrial Revolution* (Xu et al., 2018), a change boosted by the critical role of digitalization and new technologies. Digital development has implications for the Sustainable Development Goals (SDGs) set out in the United Nations

2030 Agenda: countries, institutions and organizations should commit with the goal of reducing the digital divide to avoid the potential negative effects of digital exclusion (Kulkarni and Ghosh, 2021).

Companies often define technological innovation strategies based on the development and use of ICTs, focusing on infrastructure management (Matt et al., 2015). This causes a limited impact when it comes to achieving the creation of new scenarios and value propositions. So, just using ICTs, even squeezing their maximum performance, may provide organizations with scarce outcomes.

So, digitally transforming an organization is much more than just digitalizing it. It is the result of an organizational change where people, processes and the entire business model understand technology as a tool to generate value among its consumers and collaborators (Schwab, 2016). According to Demirkan et al. (2016: 14), DT is "the profound and accelerating transformation of business activities, processes, competencies, and models to fully leverage the changes and opportunities brought by digital technologies and their impact across society in a strategic and prioritized way." Westerman et al. (2014) define the DT of an organization as the use of digital technologies to radically improve its performance and scope.

We are facing a disruptive change that will affect all organizations and their professionals (Schwab, 2016). It can generate resistance due to emotional, cognitive and behavioral reasons. To reduce this resistance, it is necessary to define an appropriate strategy to address it, with leaders being responsible for clearly communicating the need for change and encouraging professionals to participate in the project. By reducing resistance, an organization's performance throughout the process will increase (Perides et al., 2020). Organizations are thus facing massive changes in work design and leadership, pushing new attitudes, values and ideas, which results in a complete cultural change. The new job profiles required are those that are adapted to the new positions. These workers will demand a new type of leadership oriented towards the relationships between people: more teamwork, more networked structures and greater need for training.

The adoption of new methodologies, processes, and technologies tends to be unbalanced depending on the age of the employees. As a rule, with some exceptions, this process tends to be more troublesome for those who have been in the organization for a longer period of time, as it pushes them out of their comfort zone. On the other hand, people who have joined the organization more recently, even if they find it easier to incorporate these methodologies, processes, and technologies, still have to internalize the culture and values that experience brings. To facilitate intergenerational cohabitation, the concept of reverse mentoring (Chaudhuri and Ghosh, 2012), understood as the pairing of a younger, junior employee, who acts as a mentor to share his/her technological skills with an older person with extensive experience in a company, becomes important. This solution can also help to create an adequate organizational climate, where the eldest members share their experience in the organization, while the youngest share their technological skills.

In today's knowledge society, education plays a decisive role in the transfer of scientific and technological knowledge, as well as analytical and professional skills (Gylfason, 2001). The incorporation of the possibilities brought by ICTs in Higher Education Institutions (HEIs) is leading to the development of new strategic options using policies and plans according to the new demands of the labour market. Therefore, new learning models must be developed where both students and professors must acquire and develop new skills (Bryndin, 2019). Furthermore, HEIs are facing a disruptive scenario, with the emergence of new business models within the training sector. These models need to meet the needs of both external and internal stakeholders, seeking their commitment and improving their experience in the organization. These changes results in the DT of a HEI (Arango Serna et al., 2018).

Almaraz et al. (2017) define the DT of HEIs as the process of technological, cultural and organizational change induced in these institutions by the development of digital technologies. It is not a matter of technology, but of people, values, systems and organizational structures, that must adopt a new model, challenging the previous ideas and assumptions. The DT of the education system is occurring in a disruptive way due to major technological developments and has been critically impacted and boosted by the requirements caused by the COVID 19 pandemic (Livari et al., 2020).

This paper aims at disentangling the intellectual knowledge structure of the research related with the digital transformation and/or digitalization of HEIs. Bibliometric analysis is a useful tool to identify development lines, novel applications, research priorities and references within a topic, according to their geographical location and research network (Wang et al., 2014). This kind of techniques allows academics to analyse a research area considering the citations, co-citations, geographical distribution and word frequency. They provide the researchers with different tools to assess the academic productivity, its impact and its relative influence; to define the intellectual structure of the research topic as well as its evolution; and to identify the different subtopics and its conceptual framework.

We can sum up these goals in some research questions, gathered in Table 1. Questions 1 to 4 have been answered carrying out a productivity analysis. In order to solve questions 5 and 6, following a bibliometric mapping approach, the VOS-Viewer software (Van Eck and Waltman, 2010) has been used to detect the structure of the research topic. The results are presented in the form of visual networks through the analysis of co-citations (documents, authors and journals) and co-words.

The main contribution of this article is to provide a synthesis of the body of research on the DT of HEIs. The relevance of this article lays on the importance of the research topic, which has increased in the current scenario caused by the emergence of the pandemic generated by COVID-19. The lockdown experienced by the population worldwide and the need, within the education

TABLE 1 Bibliometric methods used to analyze the research topic.

Techniques	Objective	Research questions	Bibliometric method	Analysis
Evaluative techniques: SCI-mat	*(1) To assess academic impact and relative influence*	RQ1. Historical evolution of the literature	*Productivity measures*	Historical evolution of publications
		RQ2. Most productive journals		Distribution of articles by journal
		RQ3. Most productive authors		Distribution of articles by author
		RQ4. Most prominent documents	*Impact metrics*	Citation analysis
Relational techniques: VOS Viewer	(2) *To determine intellectual structure*	RQ5. Main documents influencing the intellectual structure	*Co-citation*	Co-citation analysis: documents
	(3) *To identify thematic organization*	RQ6. Main journals around which the research topic of is organized		Co-citation analysis: journals
	(4) *To identify conceptual structure*	RQ7. Patterns and hot topics	*Co-occurrence*	Co-word analysis

sector, to continue with the process of remote learning through digital channels and tools, has led to the massive use of new methodologies that could facilitate remote apprenticeship. This situation has given rise to an opportunity to investigate the impact of DT on the educational process.

Though the previous literature has studied the process of DT in many fields, and even in HEIs, either it has carried out literature reviews (Benavides et al., 2020), or it has focused on aspects like sustainability (González-Zamar et al., 2020) or specific technologies (Reis-Marques et al., 2021). Therefore, there is a need to study and analyse the knowledge structure of this research field.

Materials and methods

Bibliometric analysis is a scientific field within scientometrics, which applies mathematical and statistical methods to scientific literature with the aim of studying and analysing scientific activity (White and McCain, 1998). Bibliometric methods are frequently used to assess the evolution of a given research area (Liao et al., 2018), analysing a specific scientific domain through bibliographic data through two main approaches: performance analysis and science mapping (Cobo et al., 2011). Amongst the advantages of bibliometric methods, we can state that (i) they present an overview of the scientific literature; (ii) they can generate a more objective summarization of the selected scientific papers than traditional techniques (e.g., literature review); and (iii) they are catching a growing attention of the scientific community (Corsini et al., 2019). Therefore, bibliometric analysis is a powerful tool to study a specific research topic evaluating citations, geographical distribution, co-citations and word frequency.

The objective of this study is to analyse the research trends about the DT process of HEIs. In order to do so, the first step is the selection of the existing academic literature dealing with this topic. The Web of Science (WoS) bibliographic database has been chosen for this purpose, as it is amongst the most relevant ones in the field of Social Sciences, particularly in business and education. Moreover, this database is commonly used in bibliometric analyses in the fields of management and organization.

In order to choose the publications that would be included in the bibliometric analysis and to avoid the subjectivity of the researchers in the data collection, a keyword search of the literature was performed, looking for articles published in peer-reviewed journals. Boolean logical connectors were used in a search string with the terms, ["digital transformation" OR digitalisation OR digitalization] AND [universit* OR "higher education" OR college]. The search for papers was conducted in February 2022 for the period from 1900 to 2021. A later selection eliminated part of the results, keeping only published and early access articles, granting a peer review selection process that ensures their scientific quality. The initial number of documents was 898. After a filtering process performed by the entire research team, which eliminated duplicated articles as well as those ones not directly related with the object of study, a total of 469 articles were finally chosen for the bibliometric analysis (Table 2).

Initially, Scimat software (Cobo et al., 2012) has been used in order to carry out a productivity analysis, studying the historical evolution of the publications (RQ1), the most relevant journals where they have been published (RQ2), the most productive authors (RQ3) and the most prominent documents in the field (RQ4). Relational techniques, through a bibliometric mapping approach, have been used to determine the intellectual structure of the field of knowledge, regarding the main documents, authors and journals which are the foundations of this literature (RQ5 and RQ6). Finally, the co-word analysis provides an insight into the main themes and research trends, studying the most frequent keywords (RQ7). VOS Viewer software, developed by Van Eck and Waltman, "pays special attention to the graphical representation of bibliometric maps. The functionality of VOS Viewer is especially useful for displaying large bibliometric maps in an easy-to-interpret way" (Van Eck and Waltman, 2010).

TABLE 2 Data collection.

Features	
Geographic scope	Global scientific production
Database	Web of Science (WoS)
Search criterion	Topic
Kind of document	Article (published or early access)
Time range	1900–2021
Search date	8-feb-22
Keywords	TS = (digital transformation OR digitalization OR digitalization) AND (universit* OR higher education OR college)
Number of initial documents	898
Filter criterion	Duplicated documents. Papers not related with the topic
Number of final documents	469

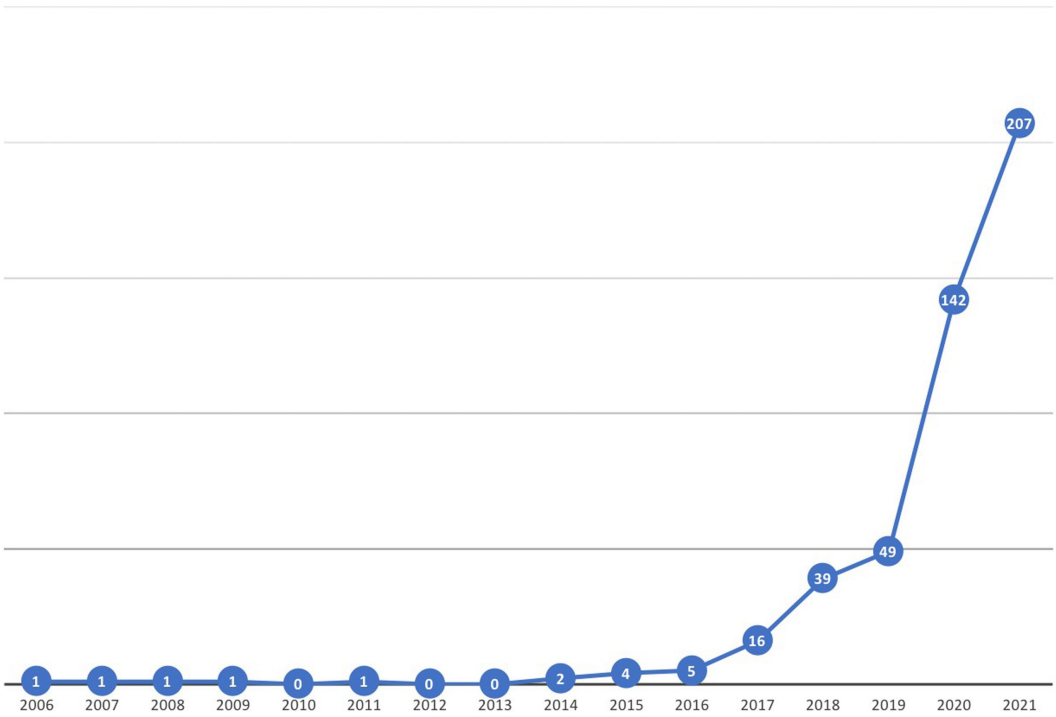

FIGURE 1
Historical evolution of publications.

Results

Evaluative techniques

Evaluative techniques analyse the relative influence and academic impact of a topic. Amongst them, we can find different productivity measures, such as the evaluation of the historical evolution of the number of publications, the distribution of the papers by area, journal and author and the analysis of the most cited papers (Hall, 2011). These measures drop an accurate image about the relative maturity of a research field (Keathley-Herring et al., 2016). These analyses have been carried out using SciMAT software (Cobo et al., 2012), as well as the information generated by WoS itself.

Measures of productivity

Figure 1 shows the total number of papers published in the field of study for the period from 2000 to December 2021. The first publications in this topic appeared in 2006. As it can be seen in the graph, there has been little concern in the literature until 2017, when we can witness a first increase in the number of academic publications. In 2020, a major boost in the literature took place, which has continued in 2021 with 207 articles being published. Between 2020 and 2021, 349 papers about the topic have been published, which means a 74.4% out of the selection of 469.

Analysing this evolution, we can assume that the pandemic generated by COVID-19, with the consequent adoption of remote and blended teaching methodologies, has been a critical factor in

the acceleration of the DT of HEIs and, therefore, has generated a dramatical increase in the scientific production about the topic. This evolution also reveals that we are facing a relatively immature research area.

According to WoS, as Table 3 reflects, most of the papers of this selection (197, 42.0%) have been published in the knowledge area of Education and Educational Research. The crisis generated by COVID-19, along with the need to adopt new teaching methodologies which could give the students a core role in their own learning process, has boosted the adoption of ICTs by HEIs and, with this new student-based focus. Some other relevant areas are Business Economics (13.4%), considering the DT of HEIs a way to compete against other institutions; and Science Technology Other Topics, Computer Science and Information Science & Library Science, more focused on the ICTs' side of DT. So, apparently there are three perspectives to board the DT of HEIs: educational, managerial and technological.

The 469 papers selected were included in 291 publications. Specifically, 218 (74.9%) of them published just 1 article; 38 (13.1%) published 2 articles; 16 (5.5%) published 3 articles and 19 (6.5%) published more than 3 articles. Journals with 6 or more papers on the research topic are listed in Table 4.

Apart from Sustainability, a journal mainly focused on Environmental Sciences, which frequently deals also with economic and managerial aspects, the most popular publications are associated with the three main perspectives identified: education (Education Sciences, European Journal of Contemporary Education); management (Business Horizons) and ICTs (International Journal of Computer Science and Network Security). There are also some relevant journals placed in the intersection of these areas, mainly combining educational and technological perspectives, such as Education and Information Technologies, International Journal of Emerging Technologies in Learning or Information Technologies and Learning Tools.

There is a total of 1,472 authors of the 469 papers. The highest proportion of authors (96.2%; $n = 1{,}416/1{,}472$) is related to only one publication, while just a 3.8% ($n = 56/1{,}472$) have taken part in two or more publications. Table 5 presents the most prolific authors.

The results reveal the presence of different research teams specialized in the analysis of the effect of technologies in education, and sometimes more specifically in HEIs. The work of Aditya (Telkom University, Indonesia), who has sometimes collaborated with Ferdiana (Universitas Gadjah Mada, Indonesia), is especially focused on the implementation of technological teaching methodologies, such as virtual classroom. García-Penalvo (University of Salamanca, Spain) has delivered a long research trajectory dealing with e-learning, which has become a major concern due to the pandemic derived from COVID-19.

The works of Abad-Segura and González-Zamar (University of Almería, Spain) have frequently dealt with the environmental foundations of the digitalization of HEIs, as well as the role played by ICTs on creativity. Kholiavko (Chernihiv Polytechnic National University, Ukraine) has published different papers (occasionally working with Djakona, from ISMA University of Applied Sciences, Latvia) related with the impact of DT in economic development, being HEIs critical in that relationship. Akhmetshin (University of Kazan, Russia) analyses the needs and steps in the creation of a digital university. The work of Vasilev (Kazan Federal University, Russia) deals more frequently with management control systems in a digital context. Finally, Zawacki-Richter (FernUniversität in Hagen, Germany) has published several works analysing specific aspects of the implementation of ICTs in HEIs, using literature reviews and bibliometric analyses.

TABLE 3 Distribution of articles by research area.

Research areas	Articles	Percentage (N/469)
Education. Educational Research	197	42.0%
Business Economics	63	13.4%
Science Technology Other Topics	47	10.0%
Environmental Sciences Ecology	31	6.6%
Computer Science	26	5.5%
Information Science Library Science	26	5.5%
Engineering	23	4.9%
Social Sciences Other Topics	18	3.8%
Psychology	12	2.6%

Measures of impact: Citation analysis

The most prominent papers in a research area are those with the highest levels of citation. Thus, citation analysis allows us to detect the influence of certain documents on a particular topic.

TABLE 4 Distribution of articles by journal.

Journal	Articles	Impact factor (2020)/categories
Sustainability	28	0.56 (JCI) Environmental Studies (Q2) Green and Sustainable Science and Technology (Q3)
Education and Information Technologies	15	1.82 (JCI) Education & Educational Research (Q1)
International Journal of Emerging Technologies in Learning	10	1.06 (JCI) Education & Educational Research (Q2)
Education Sciences	8	1.03 (JCI) Education & Educational Research (Q2)
European Journal of Contemporary Education	8	1.18 (JCI) Education & Educational Research (Q2)
Information Technologies and Learning Tools	8	0.36 (JCI) Education & Educational Research (Q3)
International Journal of Computer Science and Network Security	6	0.11 (JCI) Computer Science, Information Systems (Q4)

TABLE 5 Most prolific authors in the topic.

Rank	Name of author	Country of author	University/institution	Number of publications
1	Aditya, B.R.	Indonesia	Telkom University	4
2	Garcia-Penalvo, F.J.	Spain	University of Salamanca	4
3	Abad Segura, E.	Spain	University of Almería	3
4	González Zamar, M.D.	Spain	University of Almería	3
5	Akhmetshin, E.M.	Russia	University of Kazan	3
6	Djakona, A.	Latvia	ISMA University of Applied Sciences	3
7	Ferdiana, R.	Indonesia	Universitas Gadjah Mada	3
8	Kholiavko, N.	Ukraine	Chernihiv Polytechnic National University	3
9	Vasilev, V.L.	Russia	Kazan Federal University	3
10	Zawacki-Richter, O.	Germany	FernUniversität in Hagen	3

Table 6 shows the most cited papers amongst the 469 selected ones, ordered considering the number of citations per year.

Given that most papers have been published in 2020 and 2021, the influence and presence of COVID-19 in the academic literature about the DT of HEIs could be expected. The most cited article (100 times since its publication), Livari et al. (2020) analyzes the DT of children education driven by the pandemic, as well as the changes that higher education will have to face to adapt to the needs of this new challenging generation. Krishnamurthy (2020) has focused his study on the impact in the university, the business world and the students at business schools derived from COVID-19, that lead to a massive presence of technologies. García-Peñalvo et al. (2020) analyse the guidelines given by The Group of Online Teaching Managers of the Public Universities of a Spanish region in order to adapt the face-to-face evaluation methods to remote ones, due to the curfews and lockdowns derived from the pandemic. In another paper, García Peñalvo and Corell (2020) wonder if COVID-19 has meant a triggering event to accelerate the DT of Spanish HEIs or, in fact, has revealed previous weaknesses in the adoption of European Higher Education System requirements dealing with an education more focused on competences than on contents. Skulmowski and Rey (2020) analyse the quick process of digitalization that had to be faced by German Universities, proposing a strategy of hybrid campuses that could be useful for potential future emergencies. Mhlanga and Moloi (2020), in turn, analyse how COVID-19 could have meant a turning point in South African education system, which traditionally had physical space problems, as it pushed the transition to virtual and remote practices. Finally, Sá and Serpa (2020) also consider the challenges and opportunities brought by the pandemic to walk towards an increase in the sustainable development of teaching practices.

Nevertheless, there are three articles amongst the most cited ones which are not directly related with the pandemic. Abad-Segura et al. (2020b) carry out a bibliometric analysis about the sustainable management of DT of HEIs, stressing one of the main contributions of industry 4.0, a boost for sustainability. In fact, the role of these changes, materialized in the creation of a *glocal* (global but local) curriculum, is presented by Caniglia et al. (2018) as an opportunity to foster sustainable development. Finally, Bond et al. (2018) analyse the choices and preferences of both teachers and students in the DT of German Universities.

Evaluative techniques

Relational co-citation and co-word analysis techniques reveal the intellectual structure of the research topic, showing the main themes addressed (Zupic and Cater, 2015). A bibliometric mapping tool, the VOS-Viewer software, is used to provide a visual description of the analysis (Van Eck and Waltman, 2010).

Co-citation analysis

Co-citation analysis aims at the identification of interrelated influential works and consequently, the intellectual structure and thematic organization of a research topic. Two items are co-cited when they are cited together in another article, which means that there is thematic similarity and affinity between them. Depending on the unit, different types of co-citation analyses have been carried out in this article: document co-citation, journal or source co-citation and author co-citation.

Document co-citation analysis allows us to identify the studies that are most frequently cited together (Small, 1973). We identified 16,288 cited references in the 469 papers selected. 17 of them met the minimum threshold of being cited in at least 7 papers. Figure 2 shows the result of this analysis. The dots or nodes illustrate the references: the greater the number of citations per document, the larger the node size. The links between the nodes represent co-citation relationships. The strength of each link is illustrated by its thickness.

According to the method used by VOS-Viewer, we have found four clusters. The red one includes five references mainly related with the adoption of technologies. Venkatesh and Davis (2000), as well as Venkatesh et al. (2003), aim at enlarging the technology adoption model (TAM), which is a classical foundation when studying the adoption on technological innovations in different contexts. Two other works of Davis et al. (1989) and Davis (1989) deal also with the drivers of technological acceptance. Finally, Fornell and Larcker (1981) is mainly a methodological paper which provides academics with guidelines in order to carry out survey research in operations management.

TABLE 6 The 10 most frequently cited publications in DT of HEIs.

R	Title	Authors	Country (1st aut)	Journal	TC	(C/Y)
1	Digital transformation of everyday life – How COVID-19 pandemic transformed the basic education of the young generation and why information management research should care?	Livari et al. (2020)	Finland	International Journal of Information Management	100	50
2	The future of business education: A commentary in the shadow of the Covid-19 pandemic	Krishnamurthy (2020)	United States	Journal of Business Research	65	32.5
3	Online Assessment in Higher Education in the Time of COVID-19	García-Peñalvo et al. (2020)	Spain	Education in the Knowledge Society	65	32.5
4	Sustainable Management of Digital Transformation in Higher Education: Global Research Trends	Abad-Segura et al. (2020a)	Spain	Sustainability	46	23
5	Digital transformation in German higher education: student and teacher perceptions and usage of digital media	Bond et al. (2018)	Germany	International Journal of Educational Technology in Higher Education	73	18.25
6	The COVID-19: the enzyme of the digital transformation of teaching or the reflection of a methodological and competence crisis in higher education?	García Peñalvo and Corell (2020)	Spain	Campus Virtuales	34	17
7	COVID-19 as an accelerator for digitalization at a German university: Establishing hybrid campuses in times of crisis	Skulmowski and Rey (2020)	Germany	Human Behavior and Emerging Technologies	35	17.5
8	COVID-19 and the Digital Transformation of Education: What Are We Learning on 4IR in South Africa?	Mhlanga and Moloi (2020)	South Africa	Education Sciences	32	16
9	The COVID-19 Pandemic as an Opportunity to Foster the Sustainable Development of Teaching in Higher Education	Sá and Serpa (2020)	Portugal	Sustainability	26	13
10	The glocal curriculum: A model for transnational collaboration in higher education for sustainable development	Caniglia et al. (2018)	Germany	Journal of Cleaner Production	26	6.5

The green cluster is composed of five papers, being one of them Bond et al. (2018), which deals with the use of specific technologies by some of the most relevant stakeholders involved in this process, professors and students. Henderson et al. (2017) and Tømte et al. (2019) share the same goal of achieving a deeper understanding of the reasons underlying the higher level of adoption of specific technologies amongst students. Castañeda and Selwyn (2018) propose that maybe it is not specific tools, but their integration and use, which provides a HEI with better learning results. Finally, the seminal work of Prensky (2001) analyses the different relation with ICTs of digital natives and digital immigrants.

The yellow cluster includes just three works which could be associated with the management of the implementation of DT of HEIs. While Matt et al. (2015) directly study the DT strategies of universities and colleges, Abad-Segura et al. (2020b) work is specifically focused on the sustainable management of the process. Crawford et al. (2020) board the organizational impact of the changes required by the DT of HEIs.

Finally, the blue cluster is the less homogenous one, as it includes works which are not especially aligned with each other but are fundamental references for the rest of the papers. Hodges (2021) tries to add a practical perspective to the previous work of Hilton (2016), reacting to the crisis generated by COVID-19. Braun and Clarke (2006) deliver a methodological paper which explains the use of thematic analysis in psychology. Rapanta et al. (2020) are also concerned with the impact of COVID-19 on HEIs. Finally, Rogers and Williams (1983) is a classical reference when analysing the diffusion of innovation.

The journal co-citation analysis also contributes to the study of the thematic organization of a research field (McCain, 1990). Two sources are normally cited together when there are similarities in their research areas. In our sample of 469 documents, a total of 9,960 cited sources were identified, out of which 18 met the threshold of a minimum of 45 citations.

Figure 3 shows the existence of three main groups of journals referenced by the literature about the DT of HEIs. The red cluster, which joins the highest number of citations, gathers publications that belong directly to this same research area, that is, that deal with the use of technologies in education, such as Computers & Education, Education and Information Technologies or the British Journal of Educational Technology; along with some other ones more directly related with ICTs and systems, being MIS Quarterly a reference in this field. The blue cluster puts together some journals related with the social impact of the DT of HEIs (Sustainability, Journal of Cleaner Production, Technological Forecasting and Social Change) with some others more closely linked with research as a critical activity of HEIs (Journal of Business Research, Research Policy). Placed between them, we can find the green cluster, which includes publications linked with the management of HEIs (Studies in Higher Education, Higher Education and even the Journal of Marketing Education).

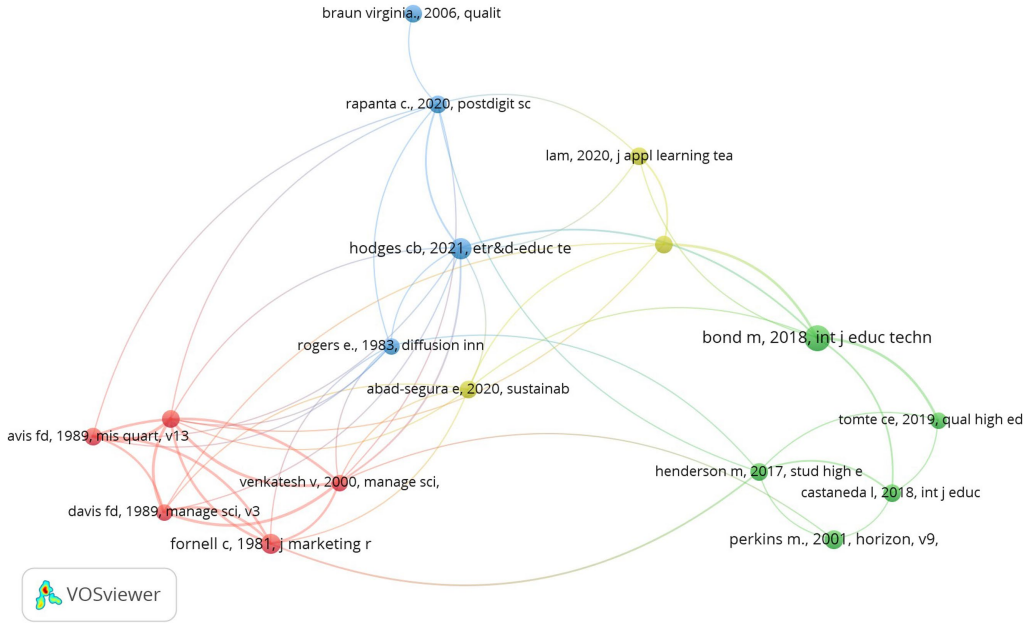

FIGURE 2
Co-citation of documents in the field of DT in HEIs.

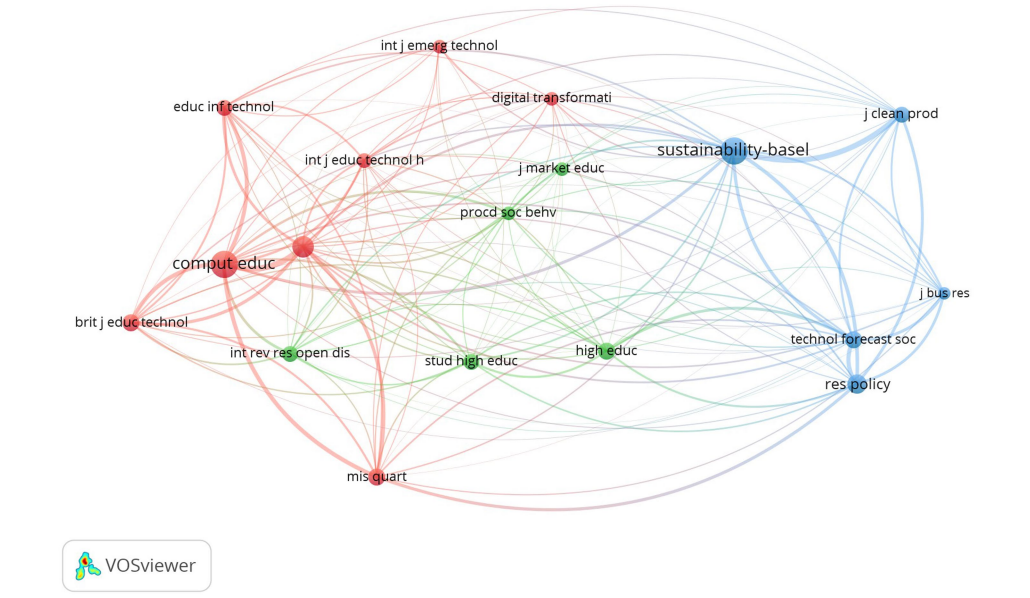

FIGURE 3
Co-citation network of journals in the field of DT in HEIs.

Co-word analysis

Research trends and hot topics emerge from the co-word analysis of the most frequent keywords (Li et al., 2016). As can be seen in Figure 4, in our sample of 469 papers, we detected 1,774 keywords. We only considered the 23 keywords that appear in at least 12 publications. The nodes illustrate the occurrence of the keywords, while the links between the nodes represent the number of times that the words appear together.

The main keywords in the research topic are: "HEIs" (167 occurrences and 332 total link strength), "digital transformation" (112 occurrences and 234 total link strength), "digitalization" (132

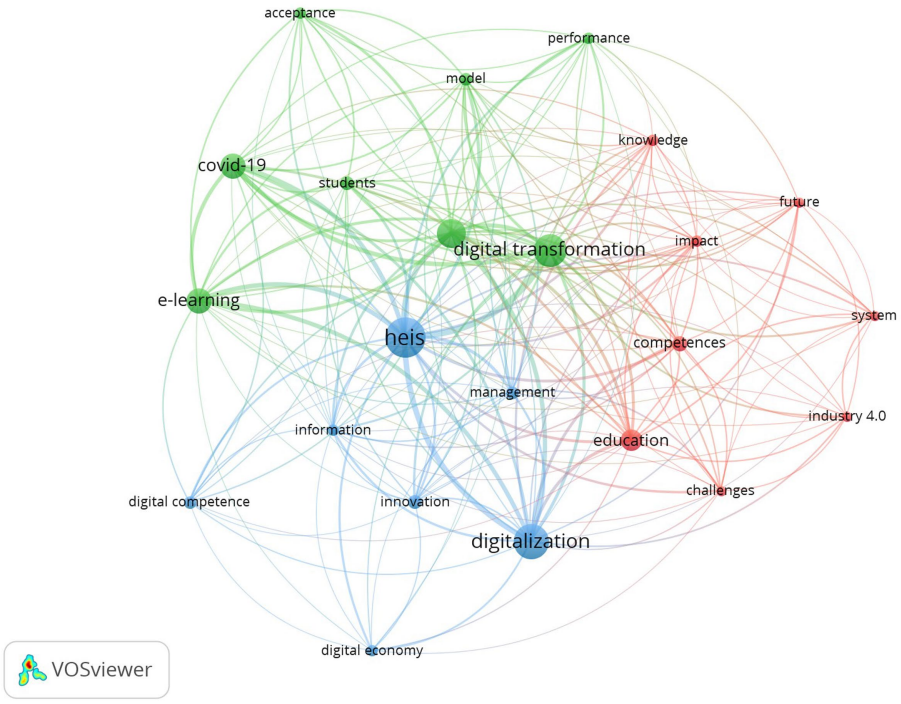

FIGURE 4
Co-occurrence network of keywords in the field of DT in HEIs.

occurrences and 203 total link strength), "ICTs" (86 occurrences and 202 total link strength) and "COVID-19" (69 occurrences and 139 total link strength). Apart from the somehow obvious ones, we can find again reflected the earthquake generated by COVID-19 in the entire sector.

The map reflects three different moments dealing with the topic. Technologies (blue cluster) appear as the initial and basic component of a first step, the "digitalization" of "HEIs," when they tiptoe into the "digital economy" using "innovations" in the "management" of the "information" of the organization, which requires the acquisition of "digital competences" by their members. The green cluster shows how "COVID-19" has forced a massive "acceptance" of "ICTs," accelerating the process of "digital transformation" of universities, which had to provide their "students" with adequate solutions to facilitate their "e-learning" experience. Finally, the red cluster deals mainly with the "future" and the "challenges" for the "education" sector as a part of "industry 4.0," which will require the creation of "systems" to manage and spread the main product of HEIs, "knowledge" creation and "competences" development.

Conclusion

Most of baby boomers and X-gen members are witnessing and actively taking part in a truly revolutionary change in the way we experience nearly every aspect of our lives. The appearance of different radically innovative ICTs (personal computers, the Internet, social media, smartphones…) have changed our interactions with each other, how we make businesses, our leisure activities and the very nature of our jobs.

Education plays a critical role in these changes. On the one hand, all these technologies have also entered schools, colleges and universities, changing the way we learn and teach nearly any subject. On the other hand, these institutions will provide the new generations with the adequate knowledge, tools and capabilities to profit from these ICTs, squeezing their future possibilities of additional disruptive changes.

Digitalizing means just a first step in the process, in which the institutions use new tools in order to carry out old activities. Further than just using technologies, digitally transforming an educational institution, or even the entire system, requires a redesign of the learning and teaching practices, reconsidering the roles of all the stakeholders involved in the educational process, promoting practices like flipped learning, gamifications or crossover learning; as well as the implementation of new managerial practices where ICTs reshape the main value activities of these organizations.

The process of DT of academic institutions experienced a complete shock when COVID-19 came into the scene. All the agents were required a maximum level of creativity in order to face this major challenge. Some practices that had been just pilot programs before 2020 became suddenly the only possible way to keep on working.

The literature about the digitalization and DT of HEIs has reflected this shocking event. Though there had been a previous growth in the academic production after 2017, its evolution would have more than likely been slower if COVID-19 crisis had not turned everything upside down. The number of publications in 2020, 142, is clearly higher than the total previously cumulated scientific production. 2021 has not meant a change in this trend, and the number of new papers has broken the barrier of 200. This exponential growth allows us to set a first conclusion: probably spurred by COVID-19, the DT of HEIs is unstoppable, and it is obviously here to stay. The scientific community has not ignored this reality, increasing the attention paid to this phenomenon.

The interest about the digitalization and DT of HEIs is not just a technological issue, but also a managerial, and especially educational, concern. Therefore, despite the importance of technical research areas (Computer Science, Engineering), nearly half of the papers analysed were published in journals linked with Educational Research, while Business Economics publications are also importantly represented. Finally, the positive impact of remote learning in sustainable development has also been reflected by the academic literature.

The theoretical foundations of the studies dealing with the DT of HEIs are related with these areas, technologies, education and management. Nevertheless, some other groundings, even philosophical ones, must be considered, as we might well be witnessing the birth of a new era which challenges many aspects related with how we conceive everything. As it has been stated before, education is necessarily a critical lever of such changes. The co-word analysis has clearly reflected the existence of a past (productive use of ICTs in HEIs), a present (the adaptation of the teaching and learning practices to the needs of the stakeholders after the burst of COVID-19) and a future (building new complete educational systems adapted to the needs of the information society) of the DT of colleges and universities.

This paper makes a relevant contribution to the state of the art, disentangling the knowledge structure of the research in this field, as well as stressing the increasing importance of this research area. The DT of HEIs is currently taking part in any organization, affecting and being affected by the needs, goals and positions of many relevant stakeholders, such as the students, the professors, the administrative staff, governments and authorities, economic agents and, last but not least, the entire society. The DT of HEIs is directly related with the achievement of one of the SDGs, #4, a Quality Education, but is undeniably a cornerstone when trying to reach any other one.

Any bibliometric analysis has to face some limitations due to its very nature, being the selection of documents to be analysed the main one. Web of Science includes the vast majority of the most prominent research in this field, though some relevant and promising studies could have been published in journals which are not indexed by WoS. The choice of the search string of the authors of this paper, combined with the selection of the keywords in the articles analysed, could have excluded specific documents from the selection. Some of the papers considered may not include keywords, influencing the results of the co-word analysis. Finally, the subjectivity of the authors of this paper cannot be completely avoided when analysing the results.

Though some of the previous research has been directly related with the implementation and adoption of some specific technologies, this is, in our opinion, a limited path. As long as the DT is here to stay, probably the most promising aspects that are being studied, and will generate more scientific dialog in the future, is the perception of the DT transformation of HEIs by the different stakeholders involved in this change (managers, professors, administrative staff, students, employers, society as a whole…), as they hold very different points of view, but probably all of them are necessary to squeeze all the potential of this technological revolution.

COVID-19 crisis has been a tragedy for mankind. It has destroyed lives and caused severe damages to many people. It has also questioned the way we were carrying out many of our tasks, sometimes considering there was no other option. Probably one of the most affected aspects has been education. But crises normally also bring the chance to rebuild and reshape. The digital transformation of universities and colleges brings our society the opportunity to do something good out of the devastation. All the agents involved have recognized this turning point and are doing their best to deliver a new and better education for the generations to come, based on the potential of ICTs, in a process that has just started. The education of the future will be more technological, connected and adapted to the needs of a brand new society.

Data availability statement

Publicly available datasets were analyzed in this study. This data can be found at: Web of Science.

Author contributions

VD-G and RG-L: conceptualization and resources. RG-L and AM-N: writing—original draft preparation and supervision. J-LR-S and VD-G: writing—review and editing and visualization. J-LR-S and AM-N: methodology and formal analysis. J-LR-S, VD-G, AM-N, and RG-L: validation. 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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References

Abad-Segura, E., González-Zamar, M., de la Rosa, A., and Gallardo-Pérez, J. (2020a). Management of the digital economy in higher education: trends and future perspectives. *Virtual Campus* 9, 57–68.

Abad-Segura, E., González-Zamar, M. D., Infante-Moro, J. C., and Ruipérez García, G. (2020b). Sustainable management of digital transformation in higher education: global research trends. *Sustainability* 12:2107. doi: 10.3390/su12052107l

Almaraz, F., Machado, A. M., and Esteban, C. L. (2017). Analysis of the digital transformation of higher education institutions: a theoretical framework. *EDMETIC* 6, 181–202.

Arango Serna, M. D., Branch, J. W., Castro Benavides, L. M., and Burgos, D. (2018). Un modelo conceptual de transformación digital. Openergy y el caso de la Universidad Nacional de Colombia. *Education in the khowledge society* 19, 95–107. doi: 10.14201/eks201819495107

Benavides, L. M. C., Tamayo Arias, J. A., Arango Serna, M. D., Branch Bedoya, J. W., and Burgos, D. (2020). Digital transformation in higher education institutions: a systematic literature review. *Sensors* 20:3291. doi: 10.3390/s20113291

Bond, M., Marín, V. I., Dolch, C., Bedenlier, S., and Zawacki-Richter, O. (2018). Digital transformation in German higher education: student and teacher perceptions and usage of digital media. *Int. J. Educ. Technol. High. Educ.* 15, 1–20. doi: 10.1186/s41239-018-0130-1

Braun, V., and Clarke, V. (2006). Using thematic analysis in psychology. *Qual. Res. Psychol.* 3, 77–101. doi: 10.1191/1478088706qp063oa

Bryndin, E. (2019). Creative innovative higher education of researchers with flexible skills and synergy of cooperation. *Contemporary Research in Education and English Language Teaching* 1, 1–6. doi: 10.33094/26410230.2019.11.1.6

Caniglia, G., John, B., Bellina, L., Lang, D. J., Wiek, A., Cohmer, S., et al. (2018). The glocal curriculum: a model for transnational collaboration in higher education for sustainable development. *J. Clean. Prod.* 171, 368–376. doi: 10.1016/j.jclepro.2017.09.207

Castañeda, L., and Selwyn, N. (2018). More than tools? Making sense of the ongoing digitizations of higher education. *Int. J. Educ. Technol. High. Educ.* 15, 1–10. doi: 10.1186/s41239-018-0109-y

Chaudhuri, S., and Ghosh, R. (2012). Reverse mentoring: a social exchange tool for keeping the boomers engaged and millennials committed. *Human. Human Resource Development Review* 11, 55–76. doi: 10.1177/1534484311417562

Cobo, M. J., López-Herrera, A. G., Herrera-Viedma, E., and Herrera, F. (2011). Science mapping software tools: review, analysis, and cooperative study among tools. *J. Am. Soc. Inf. Sci. Technol.* 62, 1382–1402. doi: 10.1002/asi.21525

Cobo, M. J., López-Herrera, A. G., Herrera-Viedma, E., and Herrera, F. (2012). SciMAT: a new science mapping analysis software tool. *J. Am. Soc. Inf. Sci. Technol.* 63, 1609–1630. doi: 10.1002/asi.22688

Corsini, F., Laurenti, R., Meinherz, F., Appio, F. P., and Mora, L. (2019). The advent of practice theories in research on sustainable consumption: past, current and future directions of the field. *Sustainability* 11:341. doi: 10.3390/su11020341

Crawford, J., Butler-Henderson, K., Rudolph, J., Malkawi, B., Glowatz, M., Burton, R., et al. (2020). COVID-19: 20 countries' higher education intra-period digital pedagogy responses. *J. Applied Learning & Teaching* 3, 1–20. doi: 10.37074/jalt.2020.3.1.7

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Q.* 13, 319–340. doi: 10.2307/249008

Davis, F. D., Bagozzi, R. P., and Warshaw, P. R. (1989). User acceptance of computer technology: a comparison of two theoretical models. *Manag. Sci.* 35, 982–1003. doi: 10.1287/mnsc.35.8.982

Demirkan, H., Spohrer, J. C., and Welser, J. J. (2016). Digital innovation and strategic transformation. *IT Professional* 18, 14–18. doi: 10.1109/MITP.2016.115

Fornell, C., and Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *J. Mark. Res.* 18, 39–50. doi: 10.2307/3151312

García Peñalvo, F. J., and Corell, A. (2020). La COVID-19: ¿enzima de la transformación digital de la docencia o reflejo de una crisis metodológica y competencial en la educación superior? *Campus Virtuales* 9, 83–98.

García-Peñalvo, F. J., Corell, A., Abella-García, V., and Grande, M. (2020). Online assessment in higher education in the time of COVID-19. *Education in the Knowledge Society* 21:3013. doi: 10.14201/eks.23013

González-Zamar, M. D., Abad-Segura, E., López-Meneses, E., and Gómez-Galán, J. (2020). Managing ICT for sustainable education: research analysis in the context of higher education. *Sustainability* 12:8254. doi: 10.3390/su12198254

Gylfason, T. (2001). Natural resources, education, and economic development. *Eur. Econ. Rev.* 45, 847–859. doi: 10.1016/S0014-2921(01)00127-1

Hall, C. M. (2011). Publish and perish? Bibliometric analysis, journal ranking and the assessment of research quality in tourism. *Tour. Manag.* 32, 16–27. doi: 10.1016/j.tourman.2010.07.001

Henderson, M., Selwyn, N., and Aston, R. (2017). What works and why? Student perceptions of 'useful'digital technology in university teaching and learning. *Stud. High. Educ.* 42, 1567–1579. doi: 10.1080/03075079.2015.1007946

Hilton, J. (2016). Open educational resources and college textbook choices: a review of research on efficacy and perceptions. *Educ. Technol. Res. Dev.* 64, 573–590. doi: 10.1007/s11423-016-9434-9

Hodges, C. B. (2021). Shift to digital perspectives on Hilton (2016) from the perspective of practice. *Educ. Technol. Res. Dev.* 69, 397–400. doi: 10.1007/s11423-020-09838-6

Keathley-Herring, H., Van Aken, E., Gonzalez-Aleu, F., Deschamps, F., Letens, G., and Orlandini, P. C. (2016). Assessing the maturity of a research area: bibliometric review and proposed framework. *Scientometrics* 109, 927–951. doi: 10.1007/s11192-016-2096-x

Krishnamurthy, S. (2020). The future of business education: a commentary in the shadow of the Covid-19 pandemic. *J. Bus. Res.* 117, 1–5. doi: 10.1016/j.jbusres.2020.05.034

Kulkarni, L., and Ghosh, A. (2021). Gender disparity in the digitalization of financial services: challenges and promises for women's financial inclusion in India. *Gend. Technol. Dev.* 25, 233–250. doi: 10.1080/09718524.2021.1911022

Li, H., An, H., Wang, Y., Huang, J., and Gao, X. (2016). Evolutionary features of academic articles co-keyword network and keywords co-occurrence network: Based on two-mode affiliation network. *Physica A: Statistical Mechanics and its Applications* 450:657–669. doi: 10.1016/j.physa.2016.01.017

Liao, H., Tang, M., Luo, L., Li, C., Chiclana, F., and Zeng, X. J. (2018). A bibliometric analysis and visualization of medical big data research. *Sustainability* 10:166. doi: 10.3390/su10010166

Livari, N., Sharma, S., and Ventä-Olkkonen, L. (2020). Digital transformation of everyday life–how COVID-19 pandemic transformed the basic education of the young generation and why information management research should care? *Int. J. Inf. Manag.* 55:102183. doi: 10.1016/j.ijinfomgt.2020.102183

Matt, C., Hess, T., and Belian, A. (2015). Digital transformation strategies. *Bus. Inf. Syst. Eng.* 57, 339–343. doi: 10.1007/s12599-015-0401-5

McCain, K. W. (1990). Mapping authors in intellectual space: a technical overview. *J. Am. Soc. Inf. Sci.* 41, 433–443. doi: 10.1002/(SICI)1097-4571(199009)41:6<433::AID-ASI11>3.0.CO;2-Q

Mhlanga, D., and Moloi, T. (2020). COVID-19 and the digital transformation of education: what are we learning on 4IR in South Africa? *Education sciences* 10:180. doi: 10.3390/educsci10070180

Perides, M., Vasconcellos, E., and Vasconcellos, L. (2020). Change management in digital transformation projects: case study in a financial organization. *Revista de Gestão e Projetos* 11, 54–73. doi: 10.5585/gep.v11i1.16087

Prensky, M. (2001). Digital natives, digital immigrants part 1: do they really think differently? *On the horizon* 9, 1–6. doi: 10.1108/10748120110424816

Rapanta, C., Botturi, L., Goodyear, P., Guàrdia, L., and Koole, M. (2020). Online university teaching during and after the Covid-19 crisis: refocusing teacher presence and learning activity. *Postdigital science and education* 2, 923–945. doi: 10.1007/s42438-020-00155-y]

Reis-Marques, C., Figueiredo, R., and de Castro Neto, M. (2021). Applications of Blockchain technology to higher education arena: a bibliometric analysis. *European Journal of Investigation in Health, Psychology and Education* 11, 1406–1421. doi: 10.3390/ejihpe11040101

Rogers, E. M., and Williams, D. (1983). *Diffusion of innovations*. Glencoe, IL: The Free Press.

Sá, M. J., and Serpa, S. (2020). The COVID-19 pandemic as an opportunity to foster the sustainable development of teaching in higher education. *Sustainability* 12:8525. doi: 10.3390/su12208525

Schwab, K. (2016). *The fourth industrial revolution*, New York: Currency.

Skulmowski, A., and Rey, G. D. (2020). COVID-19 as an accelerator for digitalization at a German university: establishing hybrid campuses in times of crisis. *Human Behavior and Emerging Technologies* 2, 212–216. doi: 10.1002/hbe2.201

Small, H. (1973). Co-citation in the scientific literature: a new measure of the relationship between two documents. *J. Am. Soc. Inf. Sci.* 24, 265–269. doi: 10.1002/asi.4630240406

Tømte, C. E., Fossland, T., Aamodt, P. O., and Degn, L. (2019). Digitalisation in higher education: mapping institutional approaches for teaching and learning. *Qual. High. Educ.* 25, 98–114. doi: 10.1080/13538322.2019.1603611

Van Eck, N., and Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics* 84, 523–538. doi: 10.1007/s11192-009-0146-3

Venkatesh, V., and Davis, F. D. (2000). A theoretical extension of the technology acceptance model: four longitudinal field studies. *Manag. Sci.* 46, 186–204. doi: 10.1287/mnsc.46.2.186.11926

Venkatesh, V., Morris, M. G., Davis, G. B., and Davis, F. D. (2003). User acceptance of information technology: toward a unified view. *MIS Q.* 27:425. doi: 10.2307/30036540

Wang, B., Pan, S. Y., Ke, R. Y., Wang, K., and Wei, Y. M. (2014). An overview of climate change vulnerability: a bibliometric analysis based on web of science database. *Nat. Hazards* 74, 1649–1666. doi: 10.1007/s11069-014-1260-y

Westerman, G., Bonnet, D., and McAfee, A. (2014). The nine elements of digital transformation. *MIT Sloan Manag. Rev.* 55, 1–6.

White, H., and McCain, K. (1998). Visualizing a discipline: an author co-citation analysis of information science, 1972-1995. *J. Am. Soc. Inf. Sci.* 49, 327–355.

Xu, L. D., Xu, E. L., and Li, L. (2018). Industry 4.0: state of the art and future trends. *Int. J. Prod. Res.* 56, 2941–2962. doi: 10.1080/00207543.2018.1444806

Zupic, I., and Cater, T. (2015). Bibliometric methods in management and organization. *Organ. Res. Methods* 18, 429–472. doi: 10.1177/1094428114562629

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Validating the evaluation capacity scale among practitioners in non-governmental organizations

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The growing emphasis on demonstrating the effectiveness of social services through evaluation has heightened demand for nongovernmental organization (NGO) practitioners to enhance evaluation capacity. However, a lack of validated instruments in the NGO context has hampered efforts to assess NGO practitioners' current evaluation capacity and understand how capacity-building activities could be tailored to meet NGO practitioners' actual needs and enhance their evaluation capacity. Hence, this study aims to develop the Evaluation Capacity Scale (ECS), a self-reporting instrument of NGO practitioners' capacity to conduct an effective evaluation of their service programs. Validation data was derived from 439 NGO practitioners who attended the Jockey Club MEL Institute Project in Hong Kong, China. Exploratory factor analysis of the ECS revealed three factors—evaluation mindset, evaluation implementation, and evaluation communication—and confirmatory factor analysis further validated this three-factor structure. Moreover, MANCOVA analysis demonstrated the ECS's predictive validity. Overall, the ECS demonstrated satisfactory convergent validity, high internal consistency reliability, and predictive validity, and its factor structure was supported in subgroups based on gender, age, and level of education. Theoretical and practical implications of the findings are discussed.

KEYWORDS

non-governmental organization, internal evaluation, assessment of evaluation capacity, scale validation, Hong Kong

1. Introduction

The increased importance and visibility of non-governmental organizations (NGOs) addressing social problems have heightened demand for greater transparency and accountability for the effectiveness and societal impact of various NGO programs (Suárez and Marshall, 2012; Doherty et al., 2015). In an era when cost-effectiveness is paramount,

NGOs are under pressure to improve program performance and demonstrate the effectiveness thereof (Marshall and Suárez, 2013). Due to the growing trend of contracting out government services in the past two decades, policy makers need to know the quality and value of specific public services for funding-related decisions (Spolander et al., 2014; Szczepanska, 2020). Likewise, NGO funding agencies ask for evidence to verify whether social service programs achieve specific outcomes and request grantees to regularly report performance-related information (Humphries et al., 2010; D'Ostie-Racine et al., 2016). Due to pressure from policy makers and funding agencies, NGOs have stressed the importance of learning about the effectiveness of their services so as to become more accountable and professional (Suárez and Marshall, 2012; Chauveron et al., 2021).

In response to the preceding demands for systematic evidence about the effectiveness of social services, the ability of NGO practitioners to conduct internal evaluations—evaluating service programs by themselves within their own organizations, instead of contracting external evaluation consultants to carry out evaluations—is an important topic of study in this field (Marshall and Suárez, 2013; Kelly and Rogers, 2022). By definition, evaluation refers to a broad range of activities undertaken by NGOs to assess their organization's performance, improve the effectiveness of their programs, and meet the needs of diverse stakeholders (Marshall and Suárez, 2013; Tarsilla, 2014). Several studies have found the internal evaluation activities of NGOs have intensified (Cousins et al., 2008; Clinton, 2014; Kelly and Rogers, 2022). During the past two decades, significant effort was invested in building the capacity of NGO practitioners (internal evaluators) to carry out effective evaluations themselves (Love, 1991; Taylor-Ritzler et al., 2013; Szczepanska, 2020). Despite increasing recognition of the demand to understand the evaluation capacity, few tools are available for NGO leaders, NGO practitioners, and researchers to assess the evaluation capacity (EC) of NGO practitioners (Nielsen et al., 2011). This has further hampered efforts to investigate how evaluation capacity-building (ECB) activities could find specific pain points, as well as tailor-training focus for NGO practitioners to meet their actual needs and enhance their EC (Suarez-Balcazar and Taylor-Ritzler, 2013).

As in many other parts of the world, the NGOs in Hong Kong have experienced increased accountability pressure from policy makers and funding agencies to prove their effectiveness in recent years. In 2000, influenced by the neoliberal ideology driving globalization, Hong Kong's policy makers began to use lump-sum grant subventions *via* competitive bidding, which cultivated a contract-focused culture that emphasized monitoring output and outcomes (Nip, 2010). In this context, a growing need exists to increase the effectiveness and social impact of social service programs. According to the Hong Kong Jockey Club Charities Trust (2017), 76% of their grantees believed that monitoring, reporting, and/or carrying out evaluations added value to their programs. To that end, systematic monitoring and evaluation can be achieved in various ways. Whereas some NGOs have adequate resources—including the necessary funding and personnel to conduct research that supports evidence-based practices—other organizations invite investigators from universities or research institutes to perform external evaluations. Likewise, while Hong Kong NGO practitioners' EC is potentially modifiable through engaging in capacity-building activities, one significant barrier to understanding their current capacity is the lack of validated instruments.

Hence, the current study aims to address this gap, through the development and validation of the Evaluation Capacity Scale (ECS), a rigorous self-reporting measure of NGO practitioners' capacity to conduct evaluations. Validation data was derived from the Jockey Club MEL Institute Project (see the section on "The Present Study and Participants" for more details of the project), an ECB activity in Hong Kong that aims to build NGO practitioners' EC by organizing a training and mentorship program.

2. Literature review

2.1. Significance of evaluation capacity for NGOs

In the NGO sector, conducting evaluations is a crucial approach to ensure that interventions are evidence-based and equitable, and service providers are more accountable for funds expenditures (Harman, 2019; Kelly, 2021; Kelly and Rogers, 2022). Generally, such evaluation consists of periodic assessments of the outcomes, efficiency, and impact of programs, with a specific focus on how the effects of a given program align with the expectations of the organization and the shareholders (Marshall and Suárez, 2013). More broadly, evaluation could be undertaken with an aim to gain applicable knowledge that can benefit the NGO sector (Mueller-Hirth, 2012). NGOs have long regarded evaluation as a means of gaging an organization's accountability to funding agencies (Kelly and Rogers, 2022). Demonstrating accountability to funding agencies has become essential for survival in today's competitive NGO sector (Cousins et al., 2014). Moreover, in addition to enabling NGOs to track program implementation and facilitating early identification of problems, effective evaluation practices could yield useful insights into specific evaluative practices and provide recommendations to improve NGO program planning and service delivery (Clinton, 2014; Kelly, 2021; Kelly and Rogers, 2022).

Unfortunately, the literature has extensively documented that NGO practitioners' ability to carry out evaluations has not kept pace with this trend of increasingly valuing evaluation, including lacking evaluative knowledge or skills, holding negative attitudes toward evaluation activities, and being unfamiliar with evaluation procedures (Taylor-Ritzler et al., 2013; Kelly and Rogers, 2022). In this context, building NGO practitioners' capacity to evaluate programs has become a major focus of overarching capacity-building programs in the NGO sector, particularly as a means of creating and sustaining organizational evaluation processes (Preskill and Russ-Eft, 2015). As such, an imperative need exists

to develop a validated instrument that can be suitable for use by NGO leaders, NGO practitioners, and researchers to assess the status of NGO practitioners' EC as well as to understand changes in these capacities following ECB activities.

2.2. Understanding evaluation capacity

In the evaluation literature, EC is a multidimensional concept with little consistency in how it is defined (Nielsen et al., 2011; Taylor-Ritzler et al., 2013; Morkel and Ramasobana, 2017; Kelly and Rogers, 2022). Approaching the issue from different focuses, researchers have identified numerous multidimensional competencies of NGO practitioners as necessary for effective evaluation practice, which collectively contribute to our understanding of EC's definition.

First, many researchers have proposed that EC refers to not only the cognitive domain to have sufficient evaluation knowledge but also the affective domain to be aware of the importance of evaluation, as well as being willing to acquire and use evaluation knowledge and tools (Tarsilla, 2014; Harman, 2019; Chauveron et al., 2021). In this regard, Doherty et al. (2015) have summarized that the evaluation mindset—the capacity to understand evaluation and the readiness to use it for examining service effectiveness—is essential to embed evaluations as a domain of ongoing work within NGOs. Similarly, Bourgeois and Cousins (2013) referred to the evaluation mindset as NGO practitioners' familiarity and interest in applying evaluation principles and practices. Moreover, prior research has also focused a great deal on the cultivation of an evaluation mindset among NGO practitioners as a key objective or outcome of ECB activities, including an awareness of the benefits of evaluations and the motivation to perform them, as well as the practitioners' cognitive ability to engage in evaluation practices (Suarez-Balcazar and Taylor-Ritzler, 2013; Preskill and Russ-Eft, 2015; Morkel and Ramasobana, 2017).

Second, apart from the mindset domain, NGO practitioners' practical ability to perform rigorous evaluations within their organizations is suggested as a fundamental indicator of understanding EC (Sonnichsen, 2000; Cousins et al., 2008; Preskill and Boyle, 2008; Taylor-Ritzler et al., 2013). For instance, many researchers have defined evaluation implementation as the practitioners' behavioral ability to transfer learned evaluation knowledge and skills into organizational evaluation processes and practices (Taylor-Ritzler et al., 2013). In particular, evaluation implementation is often referred to as the practice of applying evaluative knowledge and skills at the organizational level, namely the capacity to do internal evaluations with a particular emphasis on the flow of the different phases of an evaluation (Cousins et al., 2008; García-Iriarte et al., 2010). Thus, evaluation implementation, as EC's second domain, tends to emphasize knowledge translation process by taking action to apply evaluation knowledge and tools in daily practices (Preskill and Boyle, 2008; Preskill and Russ-Eft, 2015; Brown and Kelsey, 2016), including tracking program implementation, collecting process data, making internal refinements, and evaluating the final outcomes of the program (Bourgeois and Cousins, 2013; Kettner et al., 2016).

Third, since NGOs are increasingly expected to visualize their accountability and social impact *via* social media platforms, evaluation communication has recently been proposed as an important domain of EC (Medina et al., 2015; Kettner et al., 2016; DeCorby-Watson et al., 2018). For example, Mitchell (2017) defined evaluation communication as the ability of NGO practitioners to leverage communication channels and opportunities to collect and disseminate evaluation information. According to Preskill and Boyle (2008), such communication practices could significantly affect how people learn about evaluation and the extent to which evaluation practices are sustainable. Furthermore, the digital-tool boom that opened up new opportunities to disseminate the NGOs' evaluation results should not be ignored. With the rapid advances in usage simplicity and the flexible convenience of digital tools, NGOs have been observed increasingly adopting the internet and various social media platforms for presenting their service effectiveness and impact to the public (Macnamara and Zerfass, 2012; Sinclair et al., 2016). Likewise, some researchers have emphasized that evaluation communication could be understood as a full range of learning about how to communicate the evaluation process and results to different stakeholders—e.g., service recipients, funding agencies, and the public—*via* different communication channels (e.g., digital tools) and at dissemination opportunities (e.g., press interviews, conferences; Kettner et al., 2016; Harman, 2019; Prosek, 2020).

Altogether, based on the extant evaluation literature, three distinct domains of EC have been identified for this study to assess NGO practitioners' multidimensional competencies to conduct effective evaluation. These domains are (1) evaluation mindset, (2) evaluation implementation, and (3) evaluation communication. These three factors will be used to constitute our conceptual domain of EC since this three-factor framework reflects a perspective that could systematically and simultaneously delineate the multiple aspects of EC, which involves not only the cognitive and affective domains but also behavioral implementation and evaluation communication. With this multidimensional framework of EC, our study aims to create a measurement tool for systematically assessing the various domains of EC among NGO practitioners.

2.3. Existing measures of evaluation capacity

Despite the significance of NGOs implementing evaluations themselves, a limited selection of tools is available for measuring practitioners' capacity to do so. The majority of the existing instruments are checklists developed after systematic analyses of the literature (Preskill and Boyle, 2008), which do not produce numeric scores to be correlated with other measures theoretically

associated with EC, thus making it difficult to test construct validity with statistical analyses. This deficiency underscores the need for an empirical validation of evaluation scales. Moreover, instead of validated instruments, most existing assessment tools in the literature have been guidelines, intrinsically general and unable to accurately evaluate whether the ECB efforts are effective in enhancing NGO practitioners' EC within NGOs (Bourgeois et al., 2018). A typical statement from Bourgeois et al.'s (2018) instrument asks respondents if they have the capacity to conduct evaluations in-house.

Existing measures generally come in a variety of lengths and are seldom designed for assessing EC covering all three domains—evaluation mindset, evaluation implementation, and evaluation communication. For instance, Arnold (2006) developed a seven-item scale and asked study participants to rate their overall EC, knowledge of evaluation, and competence in evaluation; notably, the items in this scale are very general, which makes it difficult to discern specific implications for future interventions. Similarly, Brandon and Higa (2004) developed and validated a five-item scale composed of general items (e.g., "*How important do you think program evaluation is?*"), and this instrument only assesses the affective domain of practitioners' ability to perform evaluations, but does not include relevant items for evaluation practices. The most commonly used scale for EC is the 68-item Evaluation Capacity Assessment Instrument devised by Taylor-Ritzler et al. (2013), which measures NGO practitioners' capacity to perform an evaluation and facilitates the use of the results to improve their abilities in this area. The length of this scale can be challenging for respondents, however, and even though the scale focuses on what practitioners think and how they implement evaluations, it does not include evaluation communication, an underexamined yet crucial domain of EC (Preskill and Boyle, 2008; Medina et al., 2015).

Overall, the lack of an empirical scale with operational items together with the constraints of extant scales due to limited domains highlights the need to develop a validated scale with operational items to cover various domains of EC. Hence, this study is meant to complement previously reported measures, with the aim of enabling more comprehensive assessment of the individual capacity to conduct an effective evaluation of their service programs among NGO practitioners.

3. Materials and methods

3.1. The present study and participants

Data for our study were derived from the Jockey Club MEL Institute Project (hereafter the MEL project). The MEL project was implemented in 2019 in Hong Kong and incorporated a certificate training course and a follow-up mentored practicum to build NGO practitioners' EC at multidimensional levels (Ngai et al., 2022). An interdisciplinary team of experienced local and overseas trainers and mentors—including business, media, information technology, and social work experts—helped NGO practitioners acquire innovative knowledge and cutting-edge skills related to evaluations. The program's certificate training course, which was implemented over the course of 2 months, systematically covered four interrelated areas: "service development and monitoring," "resource and planning management," "media and communications," and "program evaluation and impact assessment." Its aim was to help participants systematically acquire knowledge, skills, and attitudes that were conducive to successfully implementing the evaluation. Following the training workshops, a follow-up mentored practicum paired participants with mentors who coached them on ways to implement the acquired knowledge skills at their respective NGOs to effectively change the services of their organizations.

Participants were recruited from NGOs *via* email. Practitioners who indicated a willingness were interviewed and shortlisted to join the MEL project. They were also asked to invite other staff members with similar job duties who did not attend the MEL project but were interested in participating as members of the comparison group. Shortly thereafter, the participants (i.e., the training group) and their colleagues outside the project (i.e., the comparison group) were invited to be respondents. After the study participants were explicitly informed of the purpose, procedures, and related ethical information of this study, the research team obtained their signed consent to conduct the survey. All procedures were evaluated and approved by an ethics review committee prior to implementation.

A total of 439 NGO practitioners responded to the surveys before and after the MEL project, with 226 from the training group and 213 from the comparison group. This sample ($n = 439$) was used to develop and validate the proposed scale. Table 1 displays the profile of participants in the sample. The mean age of the participants was 38.24 years (SD = 8.64), more than half (64.5%) were female, most (59.0%) had a master's degree, and nearly half (49.7%) were employed in social work positions, followed by management and administrative positions (29.2%). Notably, the profile of participants in this study is comparable to the existing profile of NGO practitioners in Hong Kong (Social Work Registration Board, 2022), which shows that most (57.95%) NGO practitioners in Hong Kong are aged from 30 to 49 (34.02% for the 30–39 age group, 23.93% for the 40–49 age group), more than half are female (68.92%), and most (67.53%) have a master's degree. Accordingly, even though a nonprobability sampling strategy was adopted, sample characteristics of this study closely resemble those of the population of NGO practitioners in Hong Kong.

3.2. Measures

The Evaluation Capacity Scale (ECS) assesses the capacity of NGO practitioners to conduct an effective evaluation. The development of the ECS followed five established procedures for scale development (Clark and Watson, 1995). First, after making reference to the existing literature, we defined EC as NGO

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TABLE 1 Profile of participants in the sample.

Variables	Training group (*n*=226)	Comparison group (*n*=213)	Overall (*n*=439)
Gender			
Male	37.2	33.8	35.5
Female	62.8	66.2	64.5
Educational level			
Sub-degree/diploma	0.9	9.9	5.2
Bachelor's degree	28.8	41.3	34.9
Master's degree	68.6	48.8	59.0
Doctoral degree	1.8	0.0	0.9
Job position			
Social worker	40.7	59.2	49.7
Healthcare professional	3.1	2.8	3
Manager/administrator	34.5	23.5	29.2
Social entrepreneur	3.5	0.5	2.1
Therapist	2.7	1.4	2.1
Others	15.5	12.7	14.1
Work areas (multiple choices)			
Child services	28.3	16.0	24.3
Youth services	28.3	23.5	28.2
Family services	23.5	16.4	21.8
Older adult services	28.3	19.2	26.0
Community development services	31.0	22.1	29.0
Services for individuals with disabilities	23.9	22.5	25.2
Educational services for disadvantaged groups	19.5	15.5	19.1
Social security services	17.7	4.2	12.1
Medical services	11.9	5.6	9.7
Services for ethnic minorities	6.2	2.8	5.0
Services for offenders and drug addicts	3.5	2.8	3.5
Employment support services	4.0	0.9	2.7
Age (years)			
Mean (*SD*)	39.52 (*8.32*)	36.89 (*8.78*)	38.24 (*8.64*)

practitioners' ability to examine the effectiveness of their service programs, using results generated from the evaluation to further improve service quality and meet the needs of diverse stakeholders (Ngai et al., 2022). Second, we reviewed previous studies and proposed the following three dimensions to measure EC: (1) evaluation mindset, including an awareness of the significance of evaluation and relevant supporting resources, motivation to acquire and apply evaluation knowledge and tools, and competence (i.e., sufficient knowledge and skills) for evaluation (Bourgeois and Cousins, 2013; Morkel and Ramasobana, 2017); (2) evaluation implementation, namely the ability to engage in the full evaluation practice process, including conducting the needs assessment, formulating the evaluation plan, monitoring the process, and evaluating the final outcomes (Sonnichsen, 2000; Mitchell, 2017; Rossi et al., 2019); (3) evaluation communication, including the use of digital tools in the evaluation process and for evaluation result dissemination, as well as the necessary presentation skills for outcome/impact communication (Medina et al., 2015; Kettner et al., 2016; DeCorby-Watson et al., 2018). Third, we generated initial items to capture salient dimensions and their indicators specified above. This step involved deductive scale development approaches (Boateng et al., 2018), in which the aforementioned definitions for EC and its dimensions were used to guide item development (see the "Understanding Evaluation Capacity" section for more detailed definitions). This process generated 17 items that represent NGO practitioners' EC. Fourth, a panel of 10 experts in evaluation or NGO development was invited to independently review the conciseness, clarity, and

appropriateness of the proposed scale items. We considered their suggestions and feedback and revised the items accordingly. Fifth, we pilot tested the ECS with 10 practitioners from different NGOs. Their feedback on the clarity of the proposed items was incorporated into the revision of ECS. Since all respondents were professionals from the NGO sector who could read English proficiently, the ECS scale was developed using English and did not involve the English–Chinese translation procedure.

The ECS included a total of 17 items in a randomized order: seven items measuring evaluation mindset; six items for evaluation implementation; and four items assessing evaluation communication. Participants were asked to rate the number that reflects their actual conditions with a leading question: "*How much have you applied the following in your work?*" All items were measured on a five-point scale: 1 = *none*; 2 = *rather little*; 3 = *average*; 4 = *rather a lot*; 5 = *very much*.

First, the items related to evaluation mindset captured the extent of NGO practitioners' familiarity with and interest in applying evaluation principles and practices (Bourgeois and Cousins, 2013). Sample items included "Having an understanding of program evaluation," "Being confident applying program evaluation knowledge in your organization," and "Appreciating program evaluation knowledge in informing service delivery."

Second, items related to evaluation implementation referred to the extent to which NGO practitioners could conduct evaluations and use them within organizations (Taylor-Ritzler et al., 2013). Sample items included "Using more rigorous sampling procedures for data collection," "Conducting problem analyses and needs assessments," and "Practicing the effectiveness-based framework of monitoring, evaluation, and learning."

Third, items related to evaluation communication focused on NGO practitioners' ability to leverage conventional communication channels and digital tools to access and disseminate evaluation-related information. Sample items included "Using social media and the internet in participant recruitment and data collection," "Using digital storytelling techniques in sharing evidence-based practices," and "Conducting media and press interviews or conferences to build the brand, disseminate outcomes, and share impact."

3.3. Data analysis

Several types of data analysis were used to develop and validate the psychometric properties of the ECS. Based on the baseline data collected from all 439 practitioners before the MEL project, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were conducted. We randomly separated the entire sample into two subsamples for EFA and CFA, respectively. EFA with varimax rotation was performed with the first subsample ($n = 237$) to examine the ECS' factor structure. To determine the number of factors, the "eigenvalue higher than 1″ criterion, scree plot, and amount of variance explained were considered. A minimum loading of 0.50 was used as the cutoff for an item to be part of a factor (Hair et al., 2010; Kim et al., 2016).

CFA, performed with another subsample ($n = 202$), was conducted to validate the scale's latent structure generated from EFA. The model-fit indices were interpreted to determine the goodness of data-model fit based on a chi-square test (χ^2), root mean square error of approximation (RMSEA), standardized root mean square residual (SRMR), and comparative fit index (CFI). RMSEA and SRMR values ranging from 0.05–0.09 indicated an acceptable model fit, with lower values indicating a better model fit (Kline, 2015; Erceg et al., 2020). CFI values greater than 0.90 were an acceptable model fit, and values exceeding 0.95 indicated a good model fit (Hu and Bentler, 1999; Kline, 2015). Furthermore, we anticipated that if convergent validity exists, the ECS subscales should converge, and the correlation between the three subscales should be significant and positive. Then, we tested the internal consistency reliability and construct validity of the ECS using the full sample.

Another means of evaluating the ECS validity was to determine the extent to which it is related to future outcomes by examining its predictive validity (Lin and Yao, 2014). As stated in the Introduction, one purpose of the ECS is to assess NGO practitioners' ability to evaluate the program over time and measure the effectiveness of ECB activities. For this reason, MANCOVA was performed to test the predictive validity of the ECS, using baseline and follow-up data collected from 439 practitioners before and after the MEL project, with the status of having been trained serving as a fixed-factor independent variable, the scores for variables associated with EC post training as dependent variables, and the scores for EC variables prior to training and the sociodemographic variables (i.e., gender, age, level of education, and occupation) as covariates. All procedures in the data analysis were performed with IBM SPSS Statistics 25.0 and Mplus Version 8.

4. Results

4.1. Exploratory factor analysis

Before conducting the analysis, we performed the Kaiser–Meyer–Olkin test (KMO) to gage the suitability of the sample size for factorization. The KMO test yielded a value of 0.922, which confirmed the sample size of our study as sufficient for the factor analysis (Leech et al., 2007). Bartlett's test of sphericity yielded a significant result—$\chi^2 = 2{,}566.458$, $p < 0.001$—which meant that the data were considered to have a multivariate normal distribution.

In EFA, three factors had eigenvalues greater than 1. In light of the abovementioned criteria, extracting three factors was deemed adequate. The total contribution of these factors—Factor 1, Factor 2, and Factor 3—to the common variance was 65.682%, with their individual contributions being 6.862%, 14.762%, and 44.058%, respectively. Those results indicated that the explained common variance was adequate for a multifactorial design

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TABLE 2 Rotated factor loadings matrix from EFA (n=237).

Items	Factors		
	1	2	3
EC 1: Using digital storytelling techniques in sharing evidence-based practice	0.674		
EC 2: Using social media and the Internet in participant recruitment and data collection	0.706		
EC 3: Conducting media and press interviews/conferences for brand building and outcome/impact dissemination	0.741		
EC 4: Using public presentation skills in sharing evidence-based practice	0.623		
EI 1: Avoiding ethics violation in data collection		0.603	
EI 2: Developing performance indicators for service development and monitoring		0.590	
EI 3: Using statistics in program evaluation		0.711	
EI 4: Practicing the effectiveness-based framework of monitoring, evaluation, and learning		0.570	
EI 5: Conducting problem analyses and needs assessment		0.793	
EI 6: Using more rigorous sampling procedures for data collection		0.669	
EM 1: Having an understanding of program evaluation			0.837
EM 2: Having awareness of available research tools and technological resources for conducting program evaluation			0.810
EM 3: Appreciating program evaluation knowledge in informing service delivery			0.881
EM 4: Being confident applying program evaluation knowledge in your organization			0.860
EM 5: Sharing program evaluation knowledge with colleagues			0.883
EM 6: Engaging in peer learning about program evaluation			0.879
EM 7: Having presentation skills in sharing program evaluation results			0.808

EC = Evaluation communication; EI = Evaluation implementation; EM = Evaluation mindset.

(Costello and Osborne, 2005). Moreover, the factor loadings for Factors 1, 2, and 3 ranged from 0.623 to 0.741, from 0.570 to 0.793, and from 0.808 to 0.883, respectively. The factor loadings of the scale items exceeded the threshold value and were therefore deemed acceptable (see Table 2). Based on the theoretical foundation and meaning of the corresponding items, Factors 1, 2, and 3 were called *evaluation communication*, *evaluation implementation*, and *evaluation mindset*, respectively.

4.2. Confirmatory factor analysis and convergent validity

CFA, which was conducted to confirm the three-factor model obtained from the EFA, yielded acceptable model-fit indices of $\chi^2 = 235.779$, df = 116, $p < 0.001$, CFI = 0.948, RMSEA = 0.071, and SRMR = 0.050. As shown in Figure 1 and Table 3, all standardized factor loadings exceeded 0.50, which provided evidence supporting the scales' construct validity. The factor loadings for *evaluation communication*, *evaluation implementation*, and *evaluation mindset* ranged from 0.541 to 0.828, from 0.592 to 0.743, and from 0.847 to 0.924, respectively.

We further validated the three-factor model in subgroups according to gender (male vs. female), age (age ≤ median age of 38 years [younger] vs. age > median age of 38 years [older]), and level of education (level of education ≤ bachelor's degree [lower level of education] vs. level of education > bachelor's degree [higher level of education]). Table 4 presents the three-factor model's goodness-of-fit in relation to each subgroup. The model fit indices were all acceptable: male (n = 156), CFI = 0.933, RMSEA = 0.083, SRMR = 0.053; female (n = 283), CFI = 0.922, RMSEA = 0.085, SRMR = 0.057; younger (n = 223), CFI = 0.945, RMSEA = 0.073, SRMR = 0.051; older (n = 216), CFI = 0.928, RMSEA = 0.081, SRMR = 0.058; lower level of education (n = 176), CFI = 0.946, RMSEA = 0.074, SRMR = 0.055; and higher level of education (n = 263), CFI = 0.931, RMSEA = 0.079, SRMR = 0.057. Results showed that the three-factor model of the ECS fit each subsample well.

Moreover, as shown in Table 5, the correlation between evaluation mindset, evaluation implementation, and evaluation communication ranged from 0.445 to 0.612 ($p < 0.001$), which indicated a good convergent validity of the ECS.

4.3. Reliability analysis

Cronbach's alpha was used to estimate the scale's internal consistency and that of each subscale. The Cronbach's alphas for *evaluation mindset*, *evaluation implementation*, and *evaluation communication* at the pretest were 0.955, 0.821, and 0.747, respectively. At the posttest, the Cronbach's alphas for *evaluation mindset*, *evaluation implementation*, and *evaluation communication* were 0.958, 0.868, and 0.826, respectively. The Cronbach's alpha for the total scale was 0.918 for the pretest and 0.953 for the posttest. Notably, all results surpassed the standard, which states that a scale's reliability is deemed sufficient if its

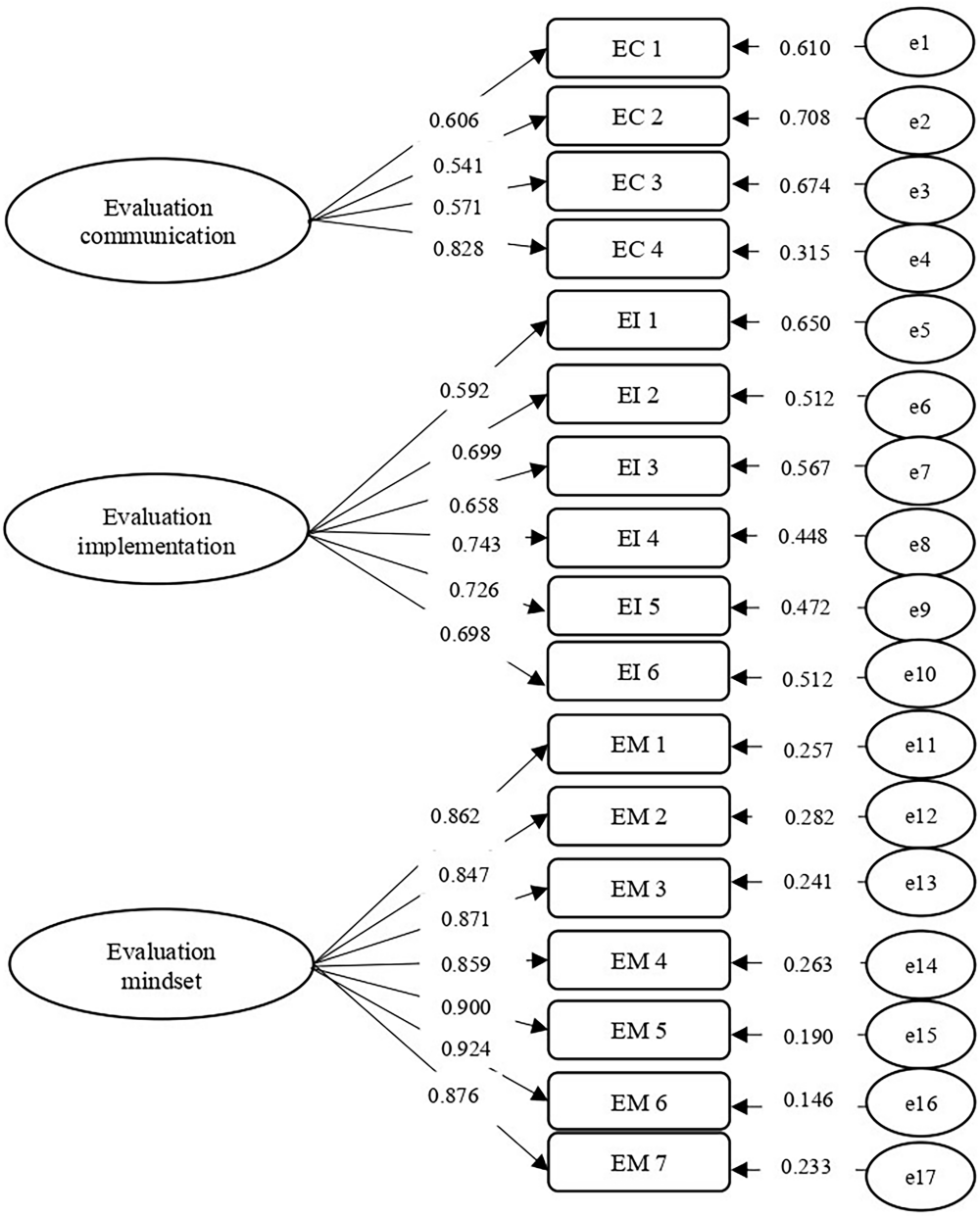

FIGURE 1
Validation of the Factor Structure with CFA (n=202). All coefficients displayed in this figure were factor loadings that are statistically significant at p<0.001 level. EC=Evaluation communication; EI=Evaluation implementation; EM=Evaluation mindset.

Cronbach's alpha exceeds 0.70, indicating satisfactory internal consistency (Hair et al., 2010; Gelashvili et al., 2021a,b).

4.4. Validity analysis

As for predictive validity, MANCOVA was conducted to test whether the ECS could detect any significant differences in NGO practitioners' EC in the training group versus their counterparts in the comparison group. The statistically significant result ($F = 29.5$, $p < 0.001$) indicated differences between NGO practitioners in the training group and comparison group in posttest scores for evaluation mindset, evaluation implementation, and evaluation communication. By extension, the tests of between-subjects effects in MANCOVA were employed to determine which dependent variables had significantly changed. As shown in Table 6, *evaluation communication* ($F = 11.984$, $p < 0.01$), *evaluation implementation* ($F = 15.059$, $p < 0.001$), and *evaluation mindset* ($F = 72.911$, $p < 0.001$) all significantly increased in the

training group after the MEL project. All of these results indicate the ECS' predictive validity.

5. Discussion

Building NGO practitioners' EC has become a prominent theme in the literature and is widely used by policy makers, funding agencies, and NGOs due to changing relationships between NGOs and their funding sources in the past two decades (Szczepanska, 2020). As policy makers emphasized devolution and decentralization, contracting and new opportunities emerged for NGOs (Suárez and Marshall, 2012), which spurred NGOs to improve capacity and obtain multilateral funding (Spolander et al., 2014; Szczepanska, 2020). In addition to pressure from funding agencies, the number of NGO management programs continues to grow, as does the need to strengthen the capacity of NGOs to fulfill multiple, increasingly complex roles (Preskill and Russ-Eft, 2015). Nevertheless, both theoretical and practical challenges persist, because little is known about how to assess NGO practitioners' capacity to perform evaluations when few validated tools are available. Therefore, the development of the ECS in our study promises to be a valuable tool for NGO leaders, NGO practitioners, and researchers to understand and assess the capacity of NGO practitioners to conduct an effective evaluation of their service programs.

A two-phase analytic method involving the EFA and the CFA was used to investigate the empirical factor structure of the ECS. The EFA supported a three-factor structure comprising evaluation mindset, evaluation implementation, and evaluation communication, all of which were previously identified as important constructs when assessing EC (Preskill and Boyle, 2008; Bourgeois and Cousins, 2013; Taylor-Ritzler et al., 2013; Doherty et al., 2015; Medina et al., 2015; Kettner et al., 2016; DeCorby-Watson et al., 2018). The three-factor structure was also supported by the CFA and yielded results that indicated an acceptable model fit and factor loadings. Items for each factor clustered well, which suggests a strong interrelation between items, and the scale's internal consistency was excellent. The model fit indices and factor loadings supported the construct validity of the ECS in the entire sample and in each subsample, and the MANCOVA results indicated a high predictive validity for the ECS. The current results suggest that the newly developed scale could be valid and reliable in the NGO context to assess practitioners' Evaluation Capacity.

TABLE 3 Factorial validity (n=202).

Scale	Parameters of significance test				
	Items	Estimate	SE	Est./SE	p-Value
Factor 1: Evaluation communication (EC)	EC 1	0.606	0.052	11.636	***
	EC 2	0.541	0.057	9.429	***
	EC 3	0.571	0.055	10.393	***
	EC 4	0.828	0.034	24.149	***
Factor 2: Evaluation implementation (EI)	EI 1	0.592	0.052	11.463	***
	EI 2	0.699	0.042	16.483	***
	EI 3	0.658	0.046	14.263	***
	EI 4	0.743	0.038	19.322	***
	EI 5	0.726	0.039	18.401	***
	EI 6	0.698	0.042	16.429	***
Factor 3: Evaluation mindset (EM)	EM 1	0.862	0.020	43.655	***
	EM 2	0.847	0.022	39.088	***
	EM 3	0.871	0.019	46.557	***
	EM 4	0.859	0.020	42.624	***
	EM 5	0.900	0.015	59.018	***
	EM 6	0.924	0.012	74.777	***
	EM 7	0.876	0.018	48.058	***

***$p < 0.001$.

5.1. Theoretical implications

This study offers several theoretical contributions. There is widespread agreement that the evaluation field still lacks validated instruments to assess NGO practitioners' EC (Nielsen et al., 2011; Suarez-Balcazar and Taylor-Ritzler, 2013). Our study fills the gap by developing a rigorous self-reporting measure, validating this scale with psychometric data, supplying empirical evidence of its

TABLE 4 Factorial validation in subsamples categorized by gender, age, and education level.

	CFA of total sample model n=439	Gender		Age		Education level	
		Male n=156	Female n=283	Younger n=223	Older n=216	Lower n=176	Higher n=263
Chi-square	235.779	239.723	351.372	254.279	281.111	228.997	306.276
Degrees of freedom	116	116	116	116	116	116	116
P-value	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
CFI	0.948	0.933	0.922	0.945	0.928	0.946	0.931
RMSEA	0.071	0.083	0.085	0.073	0.081	0.074	0.079
SRMR	0.050	0.053	0.057	0.051	0.058	0.055	0.057

validity and reliability, and making it available to NGO leaders, NGO practitioners, and researchers for assessing EC. Our findings echo the prior literature and strengthen a multidimensional conceptual foundation for understanding EC (e.g., Doherty et al., 2015). While existing measures largely focus on evaluators' knowledge and skills (Medina et al., 2015; Morkel and Ramasobana, 2017), giving only slight attention to their mindset and communication, our study yielded unique empirical findings on a distinct three-factor structure of the ECS: evaluation mindset (seven items); evaluation implementation (six items); and evaluation communication (four items). The three factors included in the ECS offer an overview of how EC could be operationalized.

This study represents a first attempt to utilize an assessment tool (i.e., the ECS) for baseline and follow-up measurements of NGO practitioners' existing capacity and the outcomes of an ECB program. First, as suggested earlier, despite other scales presented in the literature, a scarcity of validated measures existed, especially ones covering various domains of EC with operational items. Most of the existing instruments are checklists or guidelines (e.g., Brandon and Higa, 2004; Arnold, 2006), which are intrinsically general and unable to accurately assess NGO practitioners' ability to evaluate the program over time or measure the effectiveness of ECB activities. In this context, it could be argued that the ECS—a rigorous instrument with demonstrated satisfactory convergent validity, internal consistency reliability, subgroup consistency, and predictive validity—could potentially be employed by NGO leaders, NGO practitioners, and researchers seeking to assess and build NGO practitioners' EC. Moreover, while the 68-item scale derived by Taylor-Ritzler et al. (2013) has been one of the most widely used measures, its length presents a challenge to many respondents, the measuring domains are limited to the cognitive and behavioral domains, and they do not involve evaluation communication. For this reason, the ECS is not only a shorter user-friendly scale, but the development and validation thereof complements existing studies by providing empirical support for the applicability of the major dimensions suggested in the literature—evaluation mindset, evaluation implementation, and evaluation communication—in the context of NGOs (Preskill and Boyle, 2008; Bourgeois and Cousins, 2013; Doherty et al., 2015; Harman, 2019). Moreover, compared with Taylor-Ritzler et al.'s (2013) validation study, which recruited fewer participants ($n = 169$) with a lower proportion (11%) of frontline practitioners, our study included a larger sample ($n = 439$), a higher proportion (49.7%) of frontline practitioners and a diverse service area that ranged from community development services to services for offenders and drug addicts. Finally, we further validated the three-factor model in the subgroups according to gender, age, and level of education. This addition to both the scope and sample characteristics illustrates the applicability of the ECS for a variety of NGO practitioners.

TABLE 5 Correlations between evaluation mindset, evaluation implementation, and evaluation communication (n=439).

	1	2	3
1. Evaluation mindset	1.00		
2. Evaluation implementation	0.612***	1.00	
3. Evaluation communication	0.450***	0.445***	1.00

***$p < 0.001$.

5.2. Practical implications

Furthermore, this study offers significant practical implications. Recent funding constraints and the development of a contract culture have heightened the demand for increased accountability (Spolander et al., 2014). This pressure has led NGOs to emphasize the importance of effective capacity building to ensure a degree of accountability. As a consequence, there is broad recognition of the need to assess the capacity of NGO practitioners to implement evaluations related to the planning, designing, delivery, and evaluation of services rendered and ways to improve outcomes (Humphries et al., 2010). Meanwhile, improving NGO practitioners' evaluation mindset has the potential to promote positive attitudes toward the use of evaluations in daily practices. Improving the manner in which evaluations are implemented would allow NGO practitioners to use their knowledge to perform rigorous evaluations. Notably, improving evaluation-related communication would

TABLE 6 Means and standard deviations of the main variables at pre- and post-training and the MANCOVA results.

Variables	Training group (n=226)				Comparison group (n=213)				MANCOVA		
	Mean		SD		Mean		SD				
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	F	Sig	η^2
Evaluation communication	2.368	3.066	0.753	0.798	2.573	2.887	0.870	0.958	11.984	0.001	0.027
Evaluation implementation	2.786	3.357	0.719	0.675	2.924	3.144	0.763	0.836	15.059	<0.001	0.034
Evaluation mindset	2.288	3.399	0.894	0.642	2.010	2.694	0.958	1.061	72.911	<0.001	0.145

benefit NGO practitioners who wish to use digital techniques and social media to access and disseminate the evaluation findings.

Our study regarding developing and validating the psychometric qualities of the ECS suggests that it may be used by NGO leaders, NGO practitioners, and researchers to assess the status of NGO practitioners' EC. Using the ECS in practice will offer the potential to generate a useful understanding within NGOs of their practitioners' capacity to perform evaluations, and the three subscales—evaluation communication, evaluation implementation, and evaluation mindset—can also help NGOs pinpoint areas that need improvement for better capacity building. The ECS can also be administered to NGO practitioners in a variety of service fields, in different age groups, and with different levels of education since our sample included NGO practitioners representing an array of service areas for disadvantaged groups in society. Overall, our findings provide evidence supporting the use of the ECS for assessing NGO practitioners' current capacity and understanding how ECB activities may be tailored to effectively enhance their EC.

5.3. Limitations and future research

Despite these contributions and significance, our study revealed several limitations. The first limitation arose from the sampling procedure and sample size. Although we recruited practitioners from different types of NGOs and different service areas to increase participant diversity, we did not obtain a representative sample of Hong Kong NGO practitioners because the respondents were not randomly recruited. Hence, for future lines of research, we propose to adopt other sampling methods to recruit a larger population and a random sample to further examine the scale's psychometric properties and to strengthen the evidence supporting the validity and reliability of the ECS. Second, although evaluation communication could be understood as one aspect of evaluation utilization (Kelly and Rogers, 2022), the current ECS does not fully assess evaluation utilization (e.g., using evaluation results for organizational decision-making). Another future research line could be adding evaluation utilization to our proposed multidimensional framework of EC and further validating the factor structure. In addition, future research could consider performing a correlational analysis with other criterion variables to provide additional information related to discriminant and concurrent validity. Finally, because our participants were limited to Hong Kong NGO practitioners, the findings may not be generalizable outside of this region; future studies with larger samples might overcome this limitation, and the ECS could thus be validated in regions with different sociocultural contexts (Gelashvili et al., 2021a,b).

6. Conclusion

This study developed the ECS, a self-reporting measure for NGO practitioners to assess their capacity to perform evaluations, and our findings provide empirical evidence supporting the use of the ECS across a wide spectrum of service fields in the Hong Kong context. The ECS taps into multiple domains of EC—evaluation mindset, evaluation implementation, and evaluation communication, and the initial assessment of its reliability and validity presented in this study yielded promising findings. The ECS also demonstrated satisfactory convergent validity, high internal consistency reliability and predictive validity, while its factor structure was supported in subgroups based on gender, age, and level of education. Ideally, this scale could be used as a measurement instrument to assess NGO practitioners' EC as well as understanding their changes in these capacities following ECB activities. Future studies should address the delineated limitations of the present study by psychometrically testing the ECS and extending the generalization to other regions with the use of a larger representative sample.

Data availability statement

The datasets generated and/or analyzed in the current study are not publicly available, as they contain information that could compromise the privacy of research participants. The data that support the findings of this study are available from the corresponding author upon reasonable request.

Ethics statement

The studies involving human participants were reviewed and approved by Survey and Behavioral Research Ethics Committee of The Chinese University of Hong Kong. The patients/participants provided their written informed consent to participate in this study.

Author contributions

SS-yN and C-kC: conceptualization. SS-yN, C-kC, LW, and SJ: methodology. SS-yN, C-kC, YL, LZ, LW, and SJ: validation. SS-yN, C-kC, LW, and LZ: formal analysis. SS-yN, C-kC, and YL: investigation. SS-yN: resources. SS-yN, LW, and LZ: data curation. SS-yN, C-kC, LZ, YL, and EN-hY: writing—original draft preparation. SS-yN, C-kC, LW, YL, LZ, and H-yT: writing—review and editing. SS-yN, C-kC, LZ, and EN-hY: visualization. SS-yN: supervision and funding acquisition. SS-yN and H-yT: project administration. 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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Supplementary material

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References

Arnold, M. E. (2006). Developing evaluation capacity in extension 4-H field faculty: a framework for success. *Am. J. Eval.* 27, 257–269. doi: 10.1177/1098214006287989

Social Work Registration Board. (2022). Statistics on registered social workers. Available at: https://www.swrb.org.hk/en/statistic_rsw.asp (Accessed October 25, 2022).

Boateng, G. O., Neilands, T. B., Frongillo, E. A., Melgar-Quiñonez, H. R., and Young, S. L. (2018). Best practices for developing and validating scales for health, social, and behavioral research: a primer. *Front. Public Health* 6, 1–18. doi: 10.3389/fpubh.2018.00149

Bourgeois, I., and Cousins, J. B. (2013). Understanding dimensions of organizational evaluation capacity. *Am. J. Eval.* 34, 299–319. doi: 10.1177/1098214013477235

Bourgeois, I., Simmons, L., and Buetti, D. (2018). Building evaluation capacity in Ontario's public health units: promising practices and strategies. *Public Health* 159, 89–94. doi: 10.1016/j.puhe.2018.01.031

Brandon, P. R., and Higa, T. A. F. (2004). An empirical study of building the evaluation capacity of K-12 site-managed project personnel. *Can. J. Program Eval.* 19, 125–141.

Brown, N. R., and Kelsey, K. D. (2016). Prospect evaluation as an emerging pre-evaluation technique in the case of Great Plains wheat producers' use of Web 2.0 technology. *JHSE* 4, 126–140. doi: 10.54718/JMSJ8649

Chauveron, L. M., Urban, J. B., Samtani, S., Cox, M., Moorman, L., Hargraves, M., et al. (2021). Promoting evaluation in youth character development through enhanced evaluation capacity building: empirical findings from the PACE project. *New Dir. Eval.* 2021, 79–95. doi: 10.1002/ev.20447

Clark, L. A., and Watson, D. (1995). Constructing validity: basic issues in objective scale development. *Psychol. Assess.* 7, 309–319. doi: 10.1037/1040-3590.7.3.309

Clinton, J. (2014). The true impact of evaluation: motivation for ECB. *Am. J. Eval.* 35, 120–127. doi: 10.1177/1098214013499602

Costello, A. B., and Osborne, J. W. (2005). Best practices in exploratory factor analysis: four recommendations for getting the most from your analysis. *Pract. Assess. Res. Eval.* 10, 1–9. doi: 10.7275/jyj1-4868

Cousins, J. B., Elliott, C., Amo, C., Bourgeois, I., Chouinard, J., Goh, S. C., et al. (2008). Organizational capacity to do and use evaluation: results of a pan-Canadian survey of evaluators. *Can. J. Program Eval.* 23, 1–35.

Cousins, J. B., Goh, S. C., Elliott, C. J., and Bourgeois, I. (2014). Framing the capacity to do and use evaluation. *New Dir. Eval.* 2014, 7–23. doi: 10.1002/ev.20076

D'Ostie-Racine, L., Dagenais, C., and Ridde, V. (2016). A qualitative case study of evaluation use in the context of a collaborative program evaluation strategy in Burkina Faso. *Health Res. Policy Syst.* 14, 37–16. doi: 10.1186/s12961-016-0109-0

DeCorby-Watson, K., Mensah, G., Bergeron, K., Abdi, S., Rempel, B., and Manson, H. (2018). Effectiveness of capacity building interventions relevant to public health practice: a systematic review. *BMC Public Health* 18, 684–615. doi: 10.1186/s12889-018-5591-6

Doherty, B., Eccleston, R., Hansen, E., Natalier, K., and Churchill, B. (2015). Building evaluation capacity in micro community organisations—more burden than benefit? *Eval. J. Australas.* 15, 29–37. doi: 10.1177/1035719x1501500404

Erceg, N., Ružojčić, M., and Galić, Z. (2020). Misbehaving in the Corona crisis: the role of anxiety and unfounded beliefs. *Curr. Psychol.* 41, 5621–5630. doi: 10.1007/s12144-020-01040-4

García-Iriarte, E., Suarez-Balcazar, Y., Taylor-Ritzler, T., and Luna, M. (2010). A catalyst-for-change approach to evaluation capacity building. *Am. J. Eval.* 32, 168–182. doi: 10.1177/1098214010387114

Gelashvili, V., Martínez-Navalón, J. G., and Herrera Enríquez, G. (2021a). How stress and anxiety when using mobile restaurant reservation apps influence users' satisfaction and trust. *J. Indian Bus. Res.* 13, 395–412. doi: 10.1108/jibr-08-2020-0276

Gelashvili, V., Martínez-Navalón, J. G., and Saura, J. R. (2021b). Using partial least squares structural equation modeling to measure the moderating effect of gender: an empirical study. *Mathematics* 9:3150. doi: 10.3390/math9243150

Hair, J. F., Black, W. C., Babin, B. J., and Anderson, R. E. (2010). *Multivariate Data Analysis*. New Jersey, NJ: Prentice-Hall, Inc.

Harman, E. (2019). *The Great Nonprofit Evaluation Reboot: A New Approach Every Staff Member Can Understand*. Nashville, TN: Charity Channel Press.

Hong Kong Jockey Club Charities Trust (2017). Outcome evaluation approach adopted by the Hong Kong jockey club charities trust. Available at: http://ebp.hkcss.org.hk/ppt/conference/2017_1/Session3/Bryan_and_Ada.pdf (Accessed October 25, 2022).

Hu, L., and Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Struct. Equ. Model.* 6, 1–55. doi: 10.1080/10705519909540118

Humphries, D., Gomez, L., and Hartwig, K. (2010). Sustainability of NGO capacity building in southern Africa: successes and opportunities. *Int. J. Health Plan. Manag.* 26, e85–e101. doi: 10.1002/hpm.1029

Kelly, L. M. (2021). *Evaluation in Small Development Non-Profits: Deadends, Victories, and Alternative Routes*. London: Palgrave Macmillan.

Kelly, L. M., and Rogers, A. (2022). *Internal Evaluation in Non-Profit Organisations: Practitioner Perspectives on Theory, Research, and Practice*. London: Routledge.

Kettner, P. M., Moroney, R., and Martin, L. L. (2016). *Designing and Managing Programs: An Effectiveness-Based Approach*. Los Angeles, CA: Sage.

Kim, S., Kang, D., and Dinwoodie, J. (2016). Competitiveness in a multipolar port system: striving for regional gateway status in Northeast Asia. *Asian J. Shipp. Logist.* 32, 119–125. doi: 10.1016/j.ajsl.2016.05.005

Kline, R. B. (2015). *Principles and Practice of Structural Equation Modeling*. New York: The Guilford Press.

Leech, N., Barrett, K., and Morgan, G. A. (2007). *SPSS for Intermediate Statistics: Use and Interpretation*. New York: L. Erlbaum Associates.

Lin, W. L., and Yao, G. (2014). "Predictive validity" in *Encyclopedia of Quality of Life and Well-Being research*. ed. A. C. Michalos (Dordrecht: Springer)

Love, A. J. (1991). *Internal Evaluation: Building Organizations from Within*. Los Angeles, CA: SAGE Publications, Inc.

Macnamara, J., and Zerfass, A. (2012). Social media communication in organizations: The challenges of balancing openness, strategy, and management. *Int. J. Strateg. Commun.* 6, 287–308. doi: 10.1080/1553118X.2012.711402

Marshall, J. H., and Suárez, D. (2013). The flow of management practices. *Nonprofit Volunt. Sect. Q.* 43, 1033–1051. doi: 10.1177/0899764013494117

Medina, L., Acosta-Pérez, E., Velez, C., Martínez, G., Rivera, M., Sardiñas, L., et al. (2015). Training and capacity building evaluation: maximizing resources and results with success case method. *Eval. Program Plan.* 52, 126–132. doi: 10.1016/j.evalprogplan.2015.03.008

Mitchell, G. E. (2017). "Accounting for outcomes: monitoring and evaluation in the transnational NGO sector" in *Leading and Managing in the Social Sector: Strategies for Advancing Human Dignity and Social Justice*. eds. A. S. Tirmizi and J. D. Vogelsang (New York: Springer), 263–282.

Morkel, C., and Ramasobana, M. (2017). Measuring the effect of evaluation capacity building initiatives in Africa: a review. *Afr. Eval. J.* 5:a187. doi: 10.4102/aej.v5i1.187

Mueller-Hirth, N. (2012). If you don't count, you don't count: monitoring and evaluation in south African NGOs. *Dev. Change* 43, 649–670. doi: 10.1111/j.1467-7660.2012.01776.x

Ngai, S. S., Cheung, C., Li, Y., Zhao, L., Jiang, S., Wang, L., et al. (2022). Building program evaluation capacity of non-governmental organizations practitioners in Hong Kong. *Res. Soc. Work. Pract.* 32, 434–447. doi: 10.1177/10497315211067809

Nielsen, S. B., Lemire, S., and Skov, M. (2011). Measuring evaluation capacity—results and implications of a Danish study. *Am. J. Eval.* 32, 324–344. doi: 10.1177/1098214010396075

Nip, P. T. K. (2010). Social welfare development in Hong Kong. *Asia Pac. J. Soc. Work Dev.* 20, 65–81. doi: 10.1080/21650993.2010.9756076

Preskill, H., and Boyle, S. (2008). A multidisciplinary model of evaluation capacity building. *Am. J. Eval.* 29, 443–459. doi: 10.1177/1098214008324182

Preskill, H., and Russ-Eft, D. (2015). *Building Evaluation Capacity: Activities for Teaching and Training*. Los Angeles, CA: SAGE Publications, Inc.

Prosek, E. A. (2020). An introduction to mixed methods design in program evaluation. *Couns. Outcome Res. Eval.* 11, 60–70. doi: 10.1080/21501378.2019.1590688

Rossi, P. H., Lipsey, M. W., and Henry, G. T. (2019). *Evaluation: A Systematic Approach*. Los Angeles, CA: Sage.

Sinclair, A. J., Peirson-Smith, T. J., and Boerchers, M. (2016). Environmental assessments in the Internet age: the role of e-governance and social media in creating platforms for meaningful participation. *Impact Assess. Proj. Apprais.* 35, 148–157. doi: 10.1080/14615517.2016.1251697

Sonnichsen, R. C. (2000). *High Impact Internal Evaluation*. Los Angeles, CA: SAGE Publications.

Spolander, G., Engelbrecht, L., Martin, L., Strydom, M., Pervova, I., Marjanen, P., et al. (2014). The implications of neoliberalism for social work: reflections from a six-country international research collaboration. *Int. Soc. Work.* 57, 301–312. doi: 10.1177/0020872814524964

Suárez, D., and Marshall, J. H. (2012). Capacity in the NGO sector: results from a national survey in Cambodia. *Voluntas* 25, 176–200. doi: 10.1007/s11266-012-9331-8

Suarez-Balcazar, Y., and Taylor-Ritzler, T. (2013). Moving from science to practice in evaluation capacity building. *Am. J. Eval.* 35, 95–99. doi: 10.1177/1098214013499440

Szczepanska, K. (2020). NGO capacity building in the wake of Japan's triple disaster of 2011: the case of the TOMODACHI NGO leadership programme (TNLP). *Asian Stud. Rev.* 44, 401–421. doi: 10.1080/10357823.2020.1720600

Tarsilla, M. (2014). Evaluation capacity development in Africa: current landscape of international partners' initiatives, lessons learned and the way forward. *Am. J. Eval.* 2:a89. doi: 10.4102/aej.v2i1.89

Taylor-Ritzler, T., Suarez-Balcazar, Y., Garcia-Iriarte, E., Henry, D. B., and Balcazar, F. E. (2013). Understanding and measuring evaluation capacity. *Am. J. Eval.* 34, 190–206. doi: 10.1177/1098214012471421

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The relation between Self-Esteem and Productivity: An analysis in higher education institutions

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Background: Due to the importance of academic training, allowing upward socioeconomic mobility, and being key to getting out of poverty, as indicated by the United Nations in its 2030 Agenda, investment in quality education is key. The objective of this study is to analyze the impact of Self-Esteem in the work environment on Teaching and Research Productivity within the field of higher education in Spain.

Method: The research is carried out among the teaching staff of the Rey Juan Carlos University of Madrid (Spain). A structured questionnaire was used to ask about Self-Esteem and Productivity. Data analysis is conducted using 272 valid questionnaires analyzed with R-commander software. The validity of the variables is analyzed to check the quality of the questionnaire. Linear regression analysis is used to examine the relationship between Self-Esteem and Productivity and is completed with ANOVA analysis to study the most significant differences between these variables.

Results: We identified a positive correlation between Self-Esteem and Productivity, where significant differences have been observed depending on the age and seniority of the teaching staff.

Conclusion: This research contributes positively to the achievement of Sustainable Development Goals 3 (SDG3) (Good Health and Wellbeing) and 4 (Quality Education), in addition to highlighting the importance of universities ensuring the Self-Esteem of their teachers, having a very positive impact on the education received by the students, on the quality and prestige of the teaching center, and society, increasing academic research and educational quality. Similarly, the results achieved can be extrapolated to other sectors.

KEYWORDS

Self-Esteem, work environment, Productivity, education, sustainability

1. Introduction

The evidence that happy workers are more productive and deal more effectively with high workplace expectations has fostered the tendency of organizations to increase their concern for the health and wellbeing of their employees (Lyubomirsky et al., 2005; Zelenski et al., 2008; Pfeffer, 2018; Tonkin et al., 2018).

Self-Esteem has a significant impact on many essential results of employees, being identified as a determining variable on their behavior both inside and outside the workplace, affecting performance, satisfaction, commitment, turnover, work motivation, and even on the civic behavior of workers (Campbell, 1990; Pierce and Gardner, 2004).

In the specialized literature, we find studies on Self-Esteem in the work environment in areas such as the hospitality industry (Wang et al., 2020; Kim et al., 2021), construction (Wu et al., 2019), the pharmaceutical industry (Costantini et al., 2019), high technology (Norman et al., 2015), manufacturing (Elloy, 2005; Chan et al., 2012; Pan et al., 2014), banking (Lee, 2003; Lee and Peccei, 2007; Liu et al., 2013), mining (Pierce and Gardner, 2009), or the electricity sector (Tharenou and Harker, 1982).

Studies have been observed within the higher field that analyze the relationship between Self-Esteem and academic results from the student's point of view (Chilca Alva, 2017; Shin, 2018). However, no works have been identified that analyze the direct impact of Self-Esteem on the Productivity of workers within the field of Higher Education, only authors such as Takhsha et al. (2020) or Shabeer et al. (2020) have analyzed Self-Esteem in the work environment as a moderating variable of supervisor leadership, career adaptability of subordinates and ostracism within their studies at the university level.

Due to the importance of academic training, allowing upward socioeconomic mobility, and being key to getting out of poverty, as indicated by the United Nations in its 2030 Agenda, investment in quality education is key. Through this research, it is intended to contribute to the achievement of Sustainable Development Goals 4 (SDG4): Quality Education and SDG 3: Good Health and Wellbeing. This study will allow us to propose important contributions at a practical level very useful for universities, evidencing the impact that teachers' Self-Esteem has on their labor Productivity, far-reaching for students, higher education centers, and society.

Thus, the objective of this study is to analyze the impact of Self-Esteem in the work environment on the Productivity of teachers within the field of higher education in Spain. Throughout the study, a distinction is made between Teaching and Research Productivity, as these are the two main functions held by university teaching staff.

The empirical study was carried out at the Rey Juan Carlos University (URJC) in Madrid. Specifically, teachers at this university were surveyed and a total of 272 valid questionnaires were obtained. The results of the statistical analysis show a positive relationship between the Self-Esteem of university teachers and their Teaching and Research Productivity. Although significant differences have been identified according to age and professional category of the teaching staff. Within the URJC, there are organizational units (Healthy University) that develop programs in order to promote the construction of personal skills that help people feel better and function optimally in their day to day. The present study will make contributions in this regard. The originality of this article lies in the fact that the results of the study will allow the development of action plans with the aim of improving the Self-Esteem and Productivity of employees within their scope of work.

This article is divided into four sections. The first section offers a small review of the literature, the hypothesis statement is exposed, and the research model is defined. In the second, the methodology used is described. Next, in the third section, the results achieved are developed. Finally, in the fourth part, the conclusion of the study, the limitations, and future lines of research are suggested.

2. Literature review and hypothesis approach

Organization-Based Self-Esteem refers to the perceived value that an employee experiences about himself as a result of his participation in an organization and reflects whether that person feels valued and recognized as a competent and effective individual in such a context. Workers who have a high level of Self-Esteem are perceived as capable, irreplaceable, significant, competent, and as playing a valuable role in the organization (Pierce et al., 1989; Pierce and Gardner, 2004; Kim and Beehr, 2018; Neves et al., 2020; Rice et al., 2020).

The level of Organization-Based Self-Esteem is determined by factors such as individual Self-Esteem, experiences within the organization, or its structure and values. Self-Esteem in the workplace is socially determined, being shaped through interactions with others, the social learning experience, and relating to received and internalized social messages from significant others (Brookover et al., 1964; Korman, 1970; Brockner, 1988; Baumeister, 1999; McAllister and Bigley, 2002; Pierce and Gardner, 2004; Kim and Beehr, 2018).

The work experience is affected by emotions and state of mind. Individuals' reaction to work events varies over time and drives their immediate affective states. In addition, it should be noted how a positive state of mind increases the probability of the occurrence of positive events and vice versa (Weiss and Cropanzano, 1996), hence, the importance of ensuring the state of mind of workers.

Self-Esteem has a significant impact on many essential employee outcomes, such as motivation, attitudes (job satisfaction, turnover intention, or organizational commitment), behavior (civic behavior), or overall job

performance (Campbell, 1990; Pierce and Gardner, 2004). As people dedicate a large part of their lives to work, Self-Esteem in the work environment will play an important and significant role in the total scheme of their lives (Gardner and Pierce, 2011).

2.1. Self-Esteem and Productivity

In the specialized literature, both positive and negative relationships established between Organization-Based Self-Esteem and its impact on effectiveness are frequently analyzed. Efficacy, understood within the work context, is considered to improve with the increase in Organization-Based Self-Esteem (Pan et al., 2014), since employees with high Self-Esteem engage in learning behaviors more frequently than those who have a low level of Self-Esteem, since they avoid participating in the organization for fear of failure, thus missing out on opportunities for success (Hahn and Mathews, 2018; Lin et al., 2018).

Regarding performance, there are numerous papers that show how Self-Esteem helps employees to improve their performance, helping them to cope with work stress, anxiety, and depression. In addition, this performance is related to the Productivity of employees and the possible impact on the progression of their professional careers (Tharenou, 1979; Gardner et al., 2004; Brough et al., 2009; Gordon and Hood, 2020; Kim et al., 2021). Although the research by Zelenski et al. (2008) suggests that happiness can stimulate productivity.

The fact that a quarter of job performance is explained by positive wellbeing is very illuminating since positive wellbeing acts as a significant and positive predictor of employee performance (Luna-Arocas and Danvila-del-valle, 2020).

In general, individuals with a high level of Self-Esteem (in addition to other variables such as internal locus of control, generalized self-efficacy, and emotional stability) tend to be happier at work, as well as in other areas of life. In addition, individuals present higher levels of happiness when they consider that their performance is better than usual (Fisher, 2010).

There are prominent differences in the attitudes that employees present according to their level of Self-Esteem, such as perceiving certain situations at work as a challenge or an opportunity, for employees with high Self-Esteem, or identifying the same situation as a threat, for workers with low Self-Esteem. For those individuals who have weakened Self-Esteem, higher levels of social anxiety, need for approval, and sensitivity to evaluations made by third parties have been identified, in addition to having a greater probability of experiencing emotional dissonance (Schuler, 1980; Abraham, 1999; Vermunt and Steensma, 2001).

In addition, factors such as job stress, ambiguity, conflict or role overload, and job insecurity are negatively associated with Self-Esteem in the work environment due to the potential it takes to positively disrupt successful job performance. Other situations such as unemployment, for example, have been linked to feelings of depression by damaging a person's Self-Esteem (Goldsmith et al., 1996; Bowling, 2011).

Employees and organizations can be affected by the health and wellbeing of their workers since the presence of these problems result in lower productivity, lower quality decisions, higher absenteeism, and lower contributions to the organization (Danna and Griffin, 1999).

The reduction of the workload and the stressors of work, the increase in the complexity and autonomy of the position, job achievement, support for workers and their empowerment, or practices such as mentoring, are identified as variables that help to improve efficacy and work Self-Esteem (Pierce and Gardner, 2004; Lee and Peccei, 2007; Ferris et al., 2009; Singh et al., 2009; Bowling et al., 2010; Gardner and Pierce, 2013; Liu et al., 2013; Lin et al., 2018; Wu et al., 2019).

Research that includes the influence of Self-Esteem on work efficiency has been carried out in the health sector (Carson et al., 1997), pharmacist (Costantini et al., 2019), food sector (Fadilah et al., 2018), hotelier (Lin et al., 2018), banking (Liu et al., 2013), mining (Gardner and Pierce, 2011), construction (Wu et al., 2019), and in the high-tech industry (Norman et al., 2015). An investigation has been carried out in Indonesia (Fadilah et al., 2018), Korea (Hahn and Mathews, 2018), China (Liu et al., 2013; Lin et al., 2018; Yang et al., 2018), and the United States (Gardner and Pierce, 2011).

Moreover, the studies carried out by Shabeer et al. (2020) and Takhsha et al. (2020) were conducted at higher education centers in Pakistan and Iran, respectively. In them, they only identified Self-Esteem in the work environment as a moderating variable of supervisor leadership, career adaptability of subordinates, and ostracism. Therefore, no specific investigations have been identified about the impact of Self-Esteem on Productivity. Studies carried out in Europe, specifically in Spain, or in the field of higher education have not been identified either.

Based on the premise that the increase in Organization-Based Self-Esteem improves individual efficacy (Pan et al., 2014), the following hypothesis is proposed:

> *Hypothesis 1. Self-Esteem improves worker Productivity.*

3. Methodology

The information necessary to undertake the empirical study has been obtained through a structured questionnaire, given the impossibility of obtaining this data from secondary sources. Different phases were carried out for the elaboration of the questionnaire. First, the specialized literature was reviewed in

order to identify the measures for each of the variables that make up the analysis model. Second, a pre-test was carried out with the aim of improving the initial questionnaire. For this, personal interviews were arranged with five academics. The object of these interviews was the analysis of the facility to answer the questionnaire and understand it. This made it possible to introduce improvements and modify certain questions that were not easy to answer as they were formulated.

The final questionnaire is made up of a total of 18 questions designed to assess the variables of the analysis model, that is, Self-Esteem and Productivity.

To measure Self-Esteem, the Rosenberg Self-Esteem Scale (Rosenberg, 1965) has been used, validated by this same author in 1965 and by Atienza et al. (2000). In order to analyze Self-Esteem in the work environment, the questions are adapted to the work environment. The questionnaire consists of 10 items, with five positively described sentences (e.g., "I am convinced that I have good qualities to perform my job") and five negatively (e.g., "I feel that I do not have much of what to be proud of in my workplace"). The possible answers are framed on a Likert scale of five options ("strongly disagree," "disagree," "neither agree nor disagree," "agree," and "strongly agree"). In Supplementary Annex 1, it is possible to observe the items used.

To measure the Productivity variable, a distinction has been made between the Teaching Productivity and Research Productivity of the respondents, considering that university teachers, within their position, must perform both tasks (teaching and research) as established in the Organic Law of Universities (Boletín Oficial del Estado (2001) LOU, by its Spanish acronym), in the first article of the Preliminary Title in its first section establishes that the function of the University is to carry out the public service of higher education through research, teaching, and study. To measure Teaching Productivity, the item "Teacher Evaluation" is used, where the result obtained in the Teacher Evaluation Surveys conducted by the University and answered by the students is taken as a reference (1 being the minimum level and 5 being the maximum level). It offers a Likert scale with four response options ("less than 2," "between 2 and 3," "between 3 and 4," and "greater than 4").

To measure Research Productivity, the items "Publications", "Annual conferences", and "Research projects" are taken, thus considering the merits at the scientific-academic level included in the principles and guidelines for the evaluation criteria of the National Agency for Quality Assessment and Accreditation research (ANECA, by its Spanish acronym). Therefore, four questions are posed with the objective of knowing the total number of Publications carried out throughout the academic career by the participants, the number of Conferences they usually attend annually, and the number of Research Projects or contracts throughout their careers in which they have served as both principal investigators and team members. Supplementary Annex 2 includes the questions used to measure Productivity.

The sample is made up of a group of teachers belonging to Rey Juan Carlos University (Madrid, Spain). The response rate is within acceptable limits since the 272 valid questionnaires they are fully representative of the total population because it can be stated that with a confidence level of 95% the margin of error would be 0.0032.

Sample error $\sqrt{\frac{(N-n)}{n(N-1)}}$, *where N is the population and n the available sample.*

4. Results

Regarding the analysis of the validity of the measures used to measure the Self-Esteem and Productivity variables, it stands out that the validity of the content has been ensured thanks to the process of elaboration and revision of the questionnaire. Specifically, the set of representative items of the Self-Esteem variable comes from investigations where good reliability and validity results have been achieved, specifically Rosenberg (1965) and Atienza et al. (2000), and have been adapted to the characteristics specific to this research. With regard to the Productivity variable, the items representative of the merits that are considered when evaluating the activity of university teaching staff by the assessment and accreditation agencies of teaching staff activity have been included, such as ANECA (National Agency for Quality Assessment and Accreditation), in the field of Spanish Universities. In addition, the validity of the content is completed thanks to the review, critique, and pre-test of the initially proposed questionnaire.

First, we proceed to describe and analyze the sample of teachers who have responded to the survey (**Table 1**). Regarding gender, the sample is made up of 45.96% of men and 54.04% of women, which shows a certain homogeneity in terms of the gender of the respondents.

Regarding age, the most represented teachers are between 30 and 40 years old (32.35%), followed by those between 50 and 60 (27.94%), and between 40 and 50 years old (26.47%), respectively. The least represented are those over 60 years old (5.88%) and those under 30 (7.35%). Thus, more than half of the sample is between the ages of 30 and 50 years old.

Referring to seniority, 26.84% of the sample has seniority in the university field of between 5 and 10 years, being the most represented. Followed are those with an age of more than 20 years (23.53%) and less than 5 years (21.32%). The least represented are those who have been working between 15 and 20 years in the university environment (14.71%) and between 10 and 15 years (13.60%). It should be noted that more than half of those surveyed have been at the university for less than 20 years.

With respect to the professional category, 23.16% hold the position of Senior Lecturer, with the highest level of representation. Next, are the Visiting Lecturer (21.32%), Associate Lecturer (18.38%), and Assistant Lecturer (11.40%). On the contrary, the professional categories less present in the

TABLE 1 Distribution of the sample according to gender, age, seniority, and professional category.

	Freq.
Gender	
Male	45.96%
Female	54.04%
Age	
Less than 30 years old	7.35%
Between 30 and 40 years old	32.35%
Between 40 and 50 years old	26.47%
Between 50 and 60 years old	27.94%
More than 60 years old	5.88%
Seniority	
Less than 5 years	21.32%
Between 5 and 10 years	26.84%
Between 10 and 15 years	13.60%
Between 15 and 20 years	14.71%
More than 20 years	23.53%
Professional category	
Professor	6.99%
Interim Senior Lecturer	1.10%
Senior Lecturer	23.16%
Interim Tenured	0.37%
Interim Contracted Lecturer	6.99%
Contracted Lecturer	7.35%
Assistant Lecturer	11.40%
Research Assistant	2.94%
Visiting Lecturer	21.32%
Associate Lecturer	18.38%

TABLE 2 Descriptive statistics of the variables.

		Mean	Standard deviation	cv
	Self-Esteem	2.73	0.59	0.22
Research Productivity	Annual Conferences	1.70	1.78	1.04
	Research Projects	8.75	10.96	1.25
	Publications	27.94	38.17	1.36
Teaching Productivity	Teacher Evaluation	3.63	0.60	0.16

sample are Interim Tenured (0.37%), Interim Senior Lecturer (1.10%), Research Assistant (2.94%), Professor (6.99%), Interim Contracted Lecturer (6.99%), and Contracted Lecturer (7.35%). These results are consistent and correspond to percentages similar to the total URJC teaching staff in each category, which shows that the available sample can be considered sufficiently representative to carry out rigorous statistical analysis.

Second, the basic descriptive statistics for the variables analyzed are presented (Table 2). Regarding the explanatory variable Self-Esteem, and according to the Rosenberg Self-Esteem Scale (Rosenberg, 1965), respondents obtain three possible results: high, medium, or low Self-Esteem. We assigned the following values to these results: high Self-Esteem (3), intermediate Self-Esteem (2), and low Self-Esteem (1). The average of the explanatory variable Self-Esteem of all the respondents is 2.73, that is, close to the high level (3) and below the intermediate level (2). Therefore, an intermediate-high Self-Esteem is observed among the respondents.

To study the variables explained, Teaching Productivity, the item Teacher Evaluation is taken as a reference, while for Research Productivity, the items Annual Conferences, Publications, and Research Projects. The average Teaching Productivity obtained by the teachers surveyed is 3.63, which can be considered intermediate since it is measured between the values "less than 2" (minimum level) and "greater than 4" (maximum level).

Regarding Research Productivity, those surveyed usually attend somewhat less than 2 Conferences (1.70), on average, annually. Likewise, teachers in the sample have participated

TABLE 3 Comparison with the difference of means of variable Self-Esteem according to control variables.

	Mean	F welch	Sig.
Gender			
Male	2.704	0.50	0.48
Female	2.755102		
Age			
Between 30 and 40 years old	2.647727	4.129	0.00291**
Between 40 and 50 years old	2.708333		
Between 50 and 60 years old	2.894737		
More than 60 years old	2.9375		
Less than 30 years old	2.4		
Seniority			
Between 10 and 15 years	2.621622	2.696	0.0313*
Between 15 and 20 years	2.825		
Between 5 and 10 years	2.630137		
More than 20 years	2.90625		
Less than 5 years	2.672414		
Professional category			
Assistant Lecturer	2.677419	1.299	0.238
Professor	3		
Contracted Lecturer	2.7		
Interim Contracted Lecturer	2.684211		
Research Assistant	3		
Associate Lecturer	2.64		
Visiting Lecturer	2.62069		
Interim Tenured	3		
Senior Lecturer	2.825397		
Interim Senior Lecturer	3		

Significance level: *$P < 0.05$; **$P < 0.01$; ***$P < 0.001$.

TABLE 4 Comparison with the difference of means of variable Productivity according to professional category and gender.

	Self-Esteem	Teaching Productivity	Research Productivity		
		Teacher Evaluation	Publications	Annual Conferences	Research Projects
Professor					
Male	3	3.73	79.45	2.27	25
Female	3	3.75	126.25	4	20.25
Interim Senior Lecturer					
Male	3	3.5	112.5	4.5	9.5
Female	3	3	20	1	6
Senior Lecturer					
Male	2.81	3.69	54.19	1.44	14.91
Female	2.84	3.81	49.25	2.19	17.32
Interim Tenured					
Male	N/A	N/A	N/A	N/A	N/A
Female	3	3	60	1	8
Interim Contracted Lecturer					
Male	2.75	3.75	29	3.75	7
Female	2.67	3.67	24.8	1.8	7.67
Contracted Lecturer					
Male	3	3.71	23.43	1.43	9
Female	2.54	3.69	23.38	1.69	11.54
Assistant Lecturer					
Male	2.5	3.57	23.5	1.21	6.71
Female	2.89	3.88	11.47	1.82	4.65
Research Assistant					
Male	3	3.25	3.75	1	3.25
Female	3	3.75	0.75	5	1.25
Visiting Lecturer					
Male	2.63	3.16	2.58	0.89	3.27
Female	2.61	3.67	4.64	1.38	2.1
Associate Lecturer					
Male	2.5	3.5	5.97	1	2.81
Female	2.89	3.61	12.89	1.72	6.5

in 8.75 Research Projects as principal investigators or team members. In addition, the participants have a total of almost 28 Publications (27.94), on average, throughout their academic life.

The standard deviation of Self-Esteem, Annual Conferences, and Teacher Evaluation is low, thus, we can affirm that most of the data collected in the sample grouped around the mean aforementioned. On the other hand, the Research Projects and, above all, the Publications, with a high standard deviation indicate a high level of dispersion in data, with little concentration around the mean. The high standard deviation in the item Annual Conferences and Publications is due to the fact that these data are not homogeneous throughout the sample, in the sense that there are teachers with very different scientific contributions in terms of Conferences and Publications, given their seniority in the job.

On the one hand, in view of the coefficient of variation, a high dispersion is observed for Research Projects (cv = 1.36), Annual Conferences (cv = 1.25), and Teacher Evaluation (cv = 1.04). On the other hand, the degree of dispersion is lower both for Self-Esteem (cv = 0.22) and for Publications (cv = 0.16).

These results are then completed with an ANOVA analysis, in order to compare the mean difference of the explanatory variable Self-Esteem according to gender, age, seniority, and professional category (Table 3).

First, we observe that there is a statistically significant difference in the means for Self-Esteem according to age (0.00291**) and seniority (0.0313*), since for both control variables the significance level is less than 0.05. In return, the difference in means is not significant for gender and professional category.

To carry out the analysis of the mean of the explanatory variable Self-Esteem, it is necessary to take into account that it takes values between 1 (low level) and 3 (high level), considering 2 as the average level of Self-Esteem. The results, observable in **Table 3**, show how Self-Esteem is slightly higher in women than in men, both being at an intermediate-high level. Taking into account the age criterion, the teachers surveyed with the highest levels of Self-Esteem are those over 60 years old, with a level very close to 3 (2.94) that can be considered to have high Self-Esteem. Teachers between 50 and 60 years old (2.89), and between 40 and 50 years old (2.71), respectively, are the next age group with the highest levels of Self-Esteem after those over 60. For their part, respondents between 30 and 40 years old (2.65) have intermediate-high Self-Esteem. Those under 30 years old are the age group with the lowest level of Self-Esteem in the entire study (2.4), which is slightly above intermediate Self-Esteem. Results show that age is an influential factor in the level of Self-Esteem since older teachers are those who show the highest levels of Self-Esteem.

Regarding seniority in the university environment, teachers with more than 20 years of experience show the highest Self-Esteem (2.91), very close to the maximum value (3). Next, from highest to lowest Self-Esteem would be those with seniority of between 15 and 20 years (2.82), those who have been in the sector for less than 5 years (2.67), those who have experience of between 5 and 10 years (2.63), and finally, those with an age of between 10 and 15 years (2.62). The latter are the ones with the lowest level of Self-Esteem, standing at an intermediate-high level. This result is consistent with the one obtained previously in relation to age since it is understood that the teachers with more seniority are also older.

Finally, considering the professional category, those who show the highest level of Self-Esteem are those who hold the positions of Professor (3), Research Assistant (3), Interim Tenured (3), and Interim Senior Lecturer (3). On the other hand, the category of Visiting Lecturer (2.62) is the one with the lowest level of Self-Esteem, followed by the profiles of Associate Lecturer (2.64) and Assistant Lecturer (2.68). Data show how the Professor category has the highest level of Self-Esteem (3), and the Visiting Lecturer (2.62) has an intermediate-high Self-Esteem, being the lowest in the sample. These results show that there is a relationship between the contractual situation of teachers and their level of Self-Esteem since it is understood that the greater job security and greater recognition of merit, the greater Self-Esteem.

In summary, significant mean differences have been identified for age and seniority. The greater age and seniority, the higher levels of Self-Esteem are observed in the sample.

Next, we proceed to analyze the relationship between Self-Esteem and Productivity, for each category of teaching staff according to their gender (**Table 4**).

On the one hand, the figure of the Professor, who has the highest possible level of Self-Esteem (3) presents the highest number of Publications (126.5 for women) and Research Projects (25 for men and 20.25 for women) of all the samples. In addition, their participation in Annual Conferences is 4 for women, being one of the highest figures. Similarly, it occurs with the Teacher Evaluation, also being one of the highest in the sample (3.75 out of 5 for women). Therefore, the Teaching and Research Productivity of the Professor are both high. In view of these results, it can be seen how teachers with the highest Professional Category who have one of the highest levels of Self-Esteem show high Productivity both at the Teaching and Research levels. It should be noted that these teachers have a longer careers, so it makes sense that their Productivity is also greater.

The figure of Visiting Lecturer is the category that has the lowest levels of Self-Esteem in the sample (2.62), and that also presents low data on both Teaching and Research Productivity, comparing them with the rest of the Professional Categories. Looking at the variables, respectively, we see how Teaching Productivity (Teacher Evaluation) has one of the lowest ratings (3.16 out of 5 for women). The results are also scarce for Research Productivity, specifically for the item Publications (2.58 for men) and Research Projects (2.10) which also present the lowest numbers in the sample. In addition, analyzing attendance at Conferences annually, the minimum of the entire sample is observed in this professional category (0.89) for Female Visiting Lecturers.

The results observed for the figures of the Professor and Visiting Lecturer allow us to accept Hypothesis 1 that Self-Esteem improves the Productivity of workers since the highest levels of Productivity are observed in the category with high Self-Esteem, while the category with the lowest Self-Esteem of the sample presents low levels of Productivity.

On the other hand, it is worth noting the differences observed in the results according to gender. The greatest difference occurs in the Publications for Interim Senior Lecturers, with a difference of 92.5 articles between men (112.5) and women (20). A notable difference has also been observed in the Publications of Male Professors (79.45) and Female Professors (126.5), being greater in women with 46.8 more articles compared to men. The difference is also pronounced between the profile of Male Assistant Lecturers (23.5) and Female Assistant Lecturers (11.47). Regarding the Annual Conferences, the main difference can be seen in the figures for Interim Senior Lecturer, where men attend 4.5 Conferences, while women attend only 1, and Research Assistant, women attending 5 Conferences and men 1. In relation to Research Projects, Male Professors participated in 25, while Female Professors participated in less than 5 (20.25). For their part, Associate Lecturers present participation in Projects of 6.5, while their male counterparts have only participated in 2.81. No notable differences have been identified in the Teacher Evaluations.

TABLE 5 Linear regression analysis.

		Estimate	Std. error	*t* value	Sig.	R^2
Self-Esteem	Intercept	1.38	0.2	6.71	0.000000000112***	0.1639
Research Productivity	Annual Conferences	0.06	0.02	2.98	0.00313**	
	Research Projects	0.0083	0.0032	2.56	0.011*	
	Publications	0.0024	0.0009	2.63	0.00889**	
Teaching Productivity	Teacher Evaluation	0.37	0.05	6.56	0.000000000156***	

Significance level: *$P < 0.05$; **$P < 0.01$; ***$P < 0.001$.

The results achieved in the linear regression analysis (**Table 5**) can allow accepting the proposed hypothesis (significance levels lower than 0.05 for all variables), so that Self-Esteem improves the Productivity of workers within the university field of higher education, especially in the Teaching aspect.

5. Discussion

The results of this study show that Self-Esteem is positively correlated with Productivity, supporting what was stated by Lyubomirsky et al. (2005), Pfeffer (2018), and Zelenski et al. (2008) that happy workers are more productive and manage high job expectations more effectively than their dissatisfied counterparts.

The highest levels of Self-Esteem in the study have been identified for women over 60 years old, with more than 20 years of seniority in the university field, who hold the positions of Professor, Research Assistant, Interim Tenured, or Interim Senior Lecturer as a professional category.

However, the lowest levels of Self-Esteem are identified with the following profile: men under 30 years old, with seniority of fewer than 5 years, who hold the professional category of Visiting Lecturer or Associate Lecturer.

Results show how age is an influential factor in Self-Esteem, according to the studies carried out by Orth et al. (2015), where it is revealed how the highest levels of Self-Esteem of individuals occur around 60 years old.

In addition, the highest levels of Teaching Productivity and Research Productivity of the sample correspond to the figure of Professor, results that show what is exposed by the Human Capital Theory, which affirms that those workers who have greater labor seniority will be more productive (De Sivatte Font et al., 2018). Furthermore, a clear relationship between the Professional Category and the level of Self-Esteem is observed, understanding that the greater the security in the job position and the greater the recognition of merit, the greater the Self-Esteem will be, as defended by studies Mezzadri's (2021).

Furthermore, the results show how Self-Esteem increases as age, professional category, and seniority in the sector increase and, on the other hand, how Productivity is higher the longer the job seniority. For this reason, we affirm that the Self-Esteem of the workers is increasing with the passing of the years, improving Labor Productivity.

The results of this study also support the conclusion that workers with a high level of Self-Esteem see themselves as capable and competent, with a valuable role they play in the organization. Self-Esteem at work is associated with commitment to the organization and performance, among other behaviors and attitudes linked to the organization, as shown by studies by Pierce et al. (1989), Pierce and Gardner (2004), Kim and Beehr (2018), Neves et al. (2020), and Rice et al. (2020).

Large articles highlight that Self-Esteem helps employees improve their performance by helping them to deal with job stress, anxiety, and depression. Therefore, the results of the study (the figure of the Professor who holds the highest level of Self-esteem possible presents a high Productivity, both Teaching and Researcher) reinforce the idea that behavior and performance are related to the Productivity of employees and have the potential impact on their career advancement (Tharenou, 1979; Gardner et al., 2004; Brough et al., 2009; Gordon and Hood, 2020; Kim et al., 2021).

Throughout the analysis, the relationship between Self-Esteem and the control variables is observed: age, seniority, and professional category have a great influence on the level of Self-Esteem not only individually but also acting all three together.

With respect to gender, marked differences in Research Productivity are observed for Publications (Professor and Interim Senior Lecturer), Annual Conferences (Interim Senior Lecturer and Research Assistant), and Research Projects (Professor).

It is relevant to consider the idea that the organizational climate predicts organizational commitment, work performance, employee morale, and the behavior of workers in the organization, and assuming an increase in the level of Self-Esteem in the long term, the importance for universities to ensure a cultural organizational climate that contributes to the development of teachers' Self-Esteem, influencing their Teaching and Research Productivity. The reduction of the workload and stress factors, the increase in the complexity and responsibility of work, success in the position, support for workers, and their empowerment, are some of the variables that help to improve efficiency and Self-Esteem in the work environment and that could be used by universities, having an impact on their workers, students, and the institution itself.

6. Conclusion

The results obtained show the increase in Self-Esteem of teachers over the years, improving their labor productivity, and the importance of suggesting proposals that promote Self-Esteem in the teaching field, given its impact on teachers, the university, and society, being able to extrapolate these results to other organizations.

Thus, the objective of the study has been achieved, showing the relationships between the Self-Esteem of teachers in the field of higher education in Spain and their Teaching and Research Productivity. Specifically, the relationships established between Self-Esteem and the Evaluation received by teachers from their students, between Self-Esteem and Publications, between Self-Esteem and attendance at Conferences annually, and between Self-Esteem and participation in Research Projects are identified. In addition, the levels of Self-Esteem are evaluated according to the control variables: gender, age, seniority in the university field, and professional category. The results of the study indicate that analyzing Self-Esteem in the workplace could be very necessary for understanding the underline patterns of individual issues of teachers to increase their Productivity.

6.1. Theoretical and practical contributions

This article has important contributions. From the theoretical point of view, we clarify what has been studied in the literature about Self-Esteem and Productivity, which may be useful for other researchers, developing a theoretical model that brings together the main relationships of Self-Esteem in the work environment with key aspects of the worker, specifically their Productivity. From a practical point of view, the results reveal the incidence of Self-Esteem in Teacher Evaluation, Publications, attendance at Conferences, and participation in Research Projects, i.e., the influence of teachers' Self-Esteem on their Teaching and Research Productivity. These results suggest the importance of universities ensuring the Self-Esteem of their workers, enhancing it would improve the behavior of teachers in terms of Productivity, having a very positive impact on the education received by students and on the contribution to specialized literature. The implementation of practices that foster teachers' Self-Esteem would have an impact on the teaching center and its prestige, on the teachers themselves and their students, and in society, increasing academic research and educational quality. Similarly, the results achieved can be extrapolated to other sectors.

6.2. Limitations and future lines of research

The limitations of the article try to be overcome by suggesting different lines of future research.

First, one of the limitations found in the study is associated with the reliability of the information provided by the respondents since the method used to collect the information has been the survey. This instrument allows for obtaining the information that was necessary to measure the variables of the model and to access the targeted population in a reasonable period of time. However, the use of this technique means accepting certain inherent drawbacks, such as the low response rate associated with it or the loss of possible information that could be obtained with other methods.

Second, the study is carried out only in one university, the sample not too large, assuming that the results obtained cannot be generalized, so in the future, it is proposed to extend the research to other universities, in order to have a larger number of observations. It is also proposed to extend the research to other fields of study.

In addition, the article is limited to analyzing the relationship between Self-Esteem and Teaching and Research Productivity, and the analysis of other variables such as motivation, job satisfaction, or altruism of teachers may be very relevant, allowing us to know the impact of Self-Esteem on more variables in the teacher's work environment.

In the end, we consider that the approach of the contribution of Self-Esteem on sustainability and the scope of the Sustainable Development Goals (SDG) could be of vital interest to contribute positively to the fulfillment not only SDG 3 (Good Health and Wellbeing) and SDG 4 (Quality Education) but also on SDG 8 (Decent Work and Economic Growth) in case it is extrapolated to other sectors. Similarly, it is suggested the approach of a protocol of action by the university that promotes Self-Esteem among teachers in order to improve their Productivity.

Data availability statement

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

Author contributions

Both authors participated in the writing and revisions of the manuscript, have made a substantial and intellectual contribution to the work, and approved it for publication.

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.2022.1112437/full#supplementary-material

References

Abraham, R. (1999). Emotional dissonance in organizations: Conceptualizing the roles of self-esteem and job-induced tension. *Leader. Organ. Dev. J.* 20, 18–25. doi: 10.1108/01437739910251152

Atienza, F., Pons, D., Balaguer, I., and García-Merita, M. (2000). Propiedades psicométricas de la escala de satisfacción con la vida en adolescentes. *Psicothema* 12, 314–319.

Baumeister, R. F. (1999). "Self-concept, self-esteem, and identity," in *Personality: Contemporary theory and research*, 3rd Edn, eds V. Derlega, B. Winstead, and W. Jones (San Francisco, CA: Wadsworth), 246–280.

Boletín Oficial del Estado (2001). *Ley orgánica 6/2001, de 21 de diciembre, de universidades., 307, de 24 de diciembre de*. Available online at: https://www.boe.es/buscar/pdf/2001/BOE-A-2001-24515-consolidado.pdf (accessed November 24, 2022).

Bowling, N. (2011). A meta-analysis of the predictors and consequences of organization-based self-esteem. *Dev. Learn. Organ. Int. J.* 25:15. doi: 10.1108/dlo.2011.08125cad.010

Bowling, N., Eschleman, K., Wang, Q., Kirkendall, C., and Alarcon, G. (2010). A meta-analysis of the predictors and consequences of organization-based self-esteem. *J. Occup. Org. Psychol.* 83, 601–626. doi: 10.1348/096317909x454382

Brockner, J. (1988). *Self-esteem at work: Research, theory and practice*. Lexington: D.C. Heath & Co.

Brookover, W., Thomas, S., and Paterson, A. (1964). Self-concept of ability and school achievement. *Sociol. Educ.* 37:271. doi: 10.2307/2111958

Brough, P., Timms, C., and Shiels, R. (2009). "Measuring work-life balance: Validation of a new measure across five Anglo and Asian samples," in *Proceedings of the 8th industrial and organisational psychology conference (IOP)* (Melbourne, VIC: Australian Psychological Society Ltd).

Campbell, J. D. (1990). Self-esteem and clarity of the self-concept. *J. Pers. Soc. Psychol.* 59, 538–549. doi: 10.1037/0022-3514.59.3.538

Carson, J., Fagin, L., Bromn, D., Leary, J., and Bartlett, H. (1997). Self-esteem in mental health nurses: Its relationship to stress, coping and burnout. *NT Res.* 2, 361–369. doi: 10.1177/174498719700200508

Chan, S., Huang, X., Snape, E., and Lam, C. (2012). The Janus face of paternalistic leaders: Authoritarianism, benevolence, subordinates' organization-based self-esteem, and performance. *J. Organ. Behav.* 34, 108–128. doi: 10.1002/job.1797

Chilca Alva, M. (2017). Autoestima, hábitos de estudio y rendimiento académico en estudiantes universitarios. *Propósit. Represent.* 5:71. doi: 10.20511/pyr2017.v5n1.145

Costantini, A., Ceschi, A., Viragos, A., De Paola, F., and Sartori, R. (2019). The role of a new strength-based intervention on organisation-based self-esteem and work engagement. *J. Workplace Learn.* 31, 194–206. doi: 10.1108/jwl-07-2018-0091

Danna, K., and Griffin, R. W. (1999). Health and well-being in the workplace: A review and synthesis of the literature. *J. Manage.* 25, 357–384. doi: 10.1177/014920639902500305

De Sivatte Font, I., Olmos, R., Simón, C., and Martel, M. (2018). El efecto de la edad, la experiencia y la formación en la productividad laboral. *Cuadern. Inform. Econ.* 263, 13–24.

Elloy, D. (2005). The influence of superleader behaviors on organization commitment, job satisfaction and organization self-esteem in a self-managed work team. *Leader. Organ. Dev. J.* 26, 120–127. doi: 10.1108/01437730510582554

Fadilah, M., Siswanto, E., Nora, E., and Juariyah, L. (2018). The effect of self-efficacy and self-esteem towards the Pt garuda food indonesia employee's job satisfaction. *KnE Soc. Sci.* 3:79. doi: 10.18502/kss.v3i3.1875

Ferris, D., Brown, D., and Heller, D. (2009). Organizational supports and organizational deviance: The mediating role of organization-based self-esteem. *Organ. Behav. Hum. Dec. Process.* 108, 279–286. doi: 10.1016/j.obhdp.2008.09.001

Fisher, C. D. (2010). Happiness at work. *Int. J. Manage. Rev.* 12, 384–412. doi: 10.1111/j.1468-2370.2009.00270.x

Gardner, D., and Pierce, J. (2011). A question of false self-esteem. *J. Manage. Psychol.* 26, 682–699. doi: 10.1108/02683941111181770

Gardner, D., and Pierce, J. (2013). Focus of attention at work and organization-based self-esteem. *J. Manage. Psychol.* 28, 110–132. doi: 10.1108/02683941311300243

Gardner, D., Dyne, L., and Pierce, J. (2004). The effects of pay level on organization-based self-esteem and performance: A field study. *J. Occupat. Organ. Psychol.* 77, 307–322. doi: 10.1348/0963179041752646

Goldsmith, A., Veum, J., and William, D. (1996). The impact of labor force history on self-esteem and its component parts, anxiety, alienation and depression. *J. Econ. Psychol.* 17, 183–220. doi: 10.1016/0167-4870(96)00003-7

Gordon, J. R., and Hood, E. (2020). Organization-based self-esteem and work-life outcomes. *Person. Rev.* 50, 21–46. doi: 10.1108/pr-09-2019-0484

Hahn, H., and Mathews, M. (2018). Learning behaviors as a linkage between organization-based self-esteem and in-role performance. *J. Manage. Organ.* 28, 1–16. doi: 10.1017/jmo.2018.17

Kim, J., Milliman, J., and Lucas, A. (2021). Effects of CSR on affective organizational commitment via organizational justice and organization-based self-esteem. *Int. J. Hospit. Manage.* 92:102691. doi: 10.1016/j.ijhm.2020.102691

Kim, M., and Beehr, T. (2018). Organization-based self-esteem and meaningful work mediate effects of empowering leadership on employee behaviors and well-being. *J. Leader. Organ. Stud.* 25, 385–398. doi: 10.1177/1548051818762337

Korman, A. K. (1970). Toward an hypothesis of work behavior. *J. Appl. Psychol.* 54, 31–41. doi: 10.1037/h0028656

Lee, J. (2003). An analysis of the antecedents of organization-based self-esteem in two Korean banks. *Int. J. Hum. Resour. Manage.* 14, 1046–1066. doi: 10.1080/0958519032000106207

Lee, J., and Peccei, R. (2007). Perceived organizational support and affective commitment: The mediating role of organization-based self-esteem in the context of job insecurity. *J. Organ. Behav.* 28, 661–685. doi: 10.1002/job.431

Lin, N., Jang, J., and Roberts, K. (2018). Are employees with higher organization-based self-esteem less likely to quit? A moderated mediation model. *Int. J. Hospit. Manage.* 73, 116–124. doi: 10.1016/j.ijhm.2018.01.021

Liu, J., Hui, C., Lee, C., and Chen, Z. (2013). Why do i feel valued and why do i contribute? A relational approach to employee's organization-based self-esteem and job performance. *J. Manage. Stud.* 50, 1018–1040. doi: 10.1111/joms.12037

Luna-Arocas, R., and Danvila-del-valle, I. (2020). Does positive wellbeing predict job performance three moths later? *Appl. Res. Qual. Life* 16, 1555–1569. doi: 10.1007/s11482-020-09835-0

Lyubomirsky, S., King, L., and Diener, E. (2005). The benefits of frequent positive affect: Does happiness lead to success? *Psychol. Bull.* 131, 803–855. doi: 10.1037/0033-2909.131.6.803

McAllister, D., and Bigley, G. (2002). Work context and the definition of self: How organizational care influences organization-based self-esteem. *Acad. Manage. J.* 45, 894–904. doi: 10.2307/3069320

Mezzadri, J. (2021). La importancia del reconocimiento en las organizaciones. *Rev. Argent. Neurocirug.* 35, 172–176.

Neves, P., Pires, D., and Costa, S. (2020). Empowering to reduce intentions to resist future change: Organization-based self-esteem as a boundary condition. *Br. J. Manage.* 32, 872–891. doi: 10.1111/1467-8551.12436

Norman, S., Gardner, D., and Pierce, J. (2015). Leader roles, organization-based self-esteem, and employee outcomes. *Leader. Organ. Dev. J.* 36, 253–270. doi: 10.1108/lodj-06-2013-0072

Orth, U., Maes, J., and Schmitt, M. (2015). Self-esteem development across the life span: A longitudinal study with a large sample from Germany. *Dev. Psychol.* 51, 248–259. doi: 10.1037/a0038481

Pan, X., Qin, Q., and Gao, F. (2014). Psychological ownership, organization-based self-esteem and positive organizational behaviors. *Chine. Manage. Stud.* 8, 127–148. doi: 10.1108/cms-04-2014-0088

Pfeffer, F. T. (2018). Growing wealth gaps in education. *Demography* 55, 1033–1068. doi: 10.1007/s13524-018-0666-7

Pierce, J., and Gardner, D. (2004). Self-esteem within the work and organizational context: A review of the organization-based self-esteem literature. *J. Manage.* 30, 591–622. doi: 10.1016/j.jm.2003.10.001

Pierce, J., and Gardner, D. (2009). Relationships of personality and job characteristics with organization-based self-esteem. *J. Manag. Psychol.* 24, 392–409. doi: 10.1108/02683940910959735

Pierce, J., Gardner, D., Cummings, L., and Dunham, R. (1989). Organization-based self-esteem: Construct definition, measurement, and validation. *Acad. Manage. J.* 32, 622–648. doi: 10.2307/256437

Rice, D., Young, N., Johnson, D., Walton, R., and Stacy, S. (2020). Overall justice and supervisor conscientiousness: Implications for ethical leadership and employee self-esteem. *Bus. Ethics* 29, 856–869. doi: 10.1111/beer.12285

Rosenberg, M. (1965). *La autoimagen del adolescente y la sociedad*. Buenos Aires: Paidós.

Schuler, R. S. (1980). Definition and conceptualization of stress in organizations. *Org. Behav. Hum. Perform.* 25, 184–215. doi: 10.1016/0030-5073(80)90063-x

Shabeer, S., Nasir, N., and Rehman, S. (2020). Inclusive leadership and career adaptability: The mediating role of organization-based self-esteem and the moderating role of organizational justice. *Int. J. Leader. Educ.* 1–20. doi: 10.1080/13603124.2020.1787524

Shin, J. (2018). Will i find a job when i graduate? Employment anxiety, self-compassion, and life satisfaction among South Korean college students. *Int. J. Educ. Vocat. Guid.* 19, 239–256. doi: 10.1007/s10775-018-9378-1

Singh, A., Tiwari, T., and Singh, I. (2009). Effects of automation reliability and training on automationinduced complacency and perceived mental workload. *J. Indian Acad. Appl. Psychol.* 35, 9–22.

Takhsha, M., Barahimi, N., Adelpanah, A., and Salehzadeh, R. (2020). The effect of workplace ostracism on knowledge sharing: The mediating role of organization-based self-esteem and organizational silence. *J. Workplace Learn.* 32, 417–435. doi: 10.1108/jwl-07-2019-0088

Tharenou, P. (1979). Employee self-esteem: A review of the literature. *J. Vocat. Behav.* 15, 316–346. doi: 10.1016/0001-8791(79)90028-9

Tharenou, P., and Harker, P. (1982). Organizational correlates of employee self-esteem. *J. Appl. Psychol.* 67, 797–805. doi: 10.1037/0021-9010.67.6.797

Tonkin, K., Malinen, S., Näswall, K., and Kuntz, J. (2018). Building employee resilience through wellbeing in organizations. *Hum. Resour. Dev. Q.* 29, 107–124. doi: 10.1002/hrdq.21306

Vermunt, R., and Steensma, H. (2001). "Stress and justice in organizations: An exploration into justice processes with the aim to find mechanisms to reduce stress," in *Justice in the workplace*, ed. R. Cropanzano (Mahwah, NJ: Lawrence Erlbaum Associates).

Wang, X., Guchait, P., and Paşamehmetoğlu, A. (2020). Why should errors be tolerated? Perceived organizational support, organization-based self-esteem and psychological well-being. *Int. J. Contemp. Hospit. Manag.* 32, 1987–2006. doi: 10.1108/ijchm-10-2019-0869

Weiss, H. M., and Cropanzano, R. (1996). "Affective events theory: A theoretical discussion of the structure, causes and consequences of affective experiences at work," in *Research in organizational behavior: An annual series of analytical essays and critical reviews*, eds B. M. Staw and L. L. Cummings (Greenwich: JAI Press), 1–74.

Wu, X., Lyu, Y., Kwan, H., and Zhai, H. (2019). The impact of mentoring quality on protégés' organization-based self-esteem and proactive behavior: The moderating role of traditionality. *Hum. Resour. Manage.* 58, 417–430. doi: 10.1002/hrm.21968

Yang, Z., Zhang, H., Kwan, H., and Chen, S. (2018). Crossover effects of servant leadership and job social support on employee spouses: The mediating role of employee organization-based self-esteem. *J. Bus. Ethics* 147, 595–604. doi: 10.1007/s10551-015-2943-3

Zelenski, J. M., Murphy, S. A., and Jenkins, D. A. (2008). The happy-productive worker thesis revisited. *J. Happin. Stud.* 9, 521–537. doi: 10.1007/s10902-008-9087-4

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The Impact of Team Learning Climate on Innovation Performance – Mediating role of knowledge integration capability

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To address the fierce competition for corporate innovation in the digital economy, this study introduces knowledge integration capability as a mediating variable in light of social information processing theory, and explores the mechanism of team learning climate on innovation performance. Data were collected from a sample of 184 team members for statistical analysis, and Statistical methods such as descriptive statistical analysis, correlation analysis, and regression analysis were used to verify the study hypotheses through SPSS and Amos software, and the results showed that: (1) Team learning climate has a significant positive effect on knowledge integration capability. (2) Team learning climate has a significant positive effect on innovation performance. (3) Knowledge integration capability has a significant positive effect on innovation performance. (4) Knowledge integration capability partially mediates the role between team learning climate and innovation performance. The results proved the perspective of knowledge integration capability for the mechanism of team learning climate on innovation performance from the perspective of knowledge integration capability, and provided theoretical references for creating a learning climate in companies to promote members' knowledge learning and enhance innovation performance.

KEYWORDS

team learning climate, knowledge integration capability, innovation performance, empirical analysis, mediating effect

1. Introduction

With the advent of the digital economy, a new generation of information technology such as cloud computing and artificial intelligence has emerged, driving enterprise production toward intelligence and automation. The development of the digital economy is constantly shortening the validity of knowledge, compressing the cycle of new product development, and promoting fierce competition among companies. Enterprise innovation driven by the digital economy needs to support team members to share knowledge and effectively utilize and integrate the corresponding knowledge to enhance their innovation capabilities.

Today, some scholars' studies have explored the mechanisms of team supportive contextual factors on members' innovation performance, and it is generally agreed that supportive contexts can promote continuous learning for employees, thus enhancing innovation performance (Tripathi and Kalia, 2022). Team learning climate is defined as a shared perception of team members that the organization promotes, supports, and rewards their learning behaviors (Peng and Chen, 2022). It has been suggested that the learning climate is a precursor to producing valuable outcomes (Cangialosi et al., 2020) and an important potential mechanism for innovative behavior (Pigola and Da Costa, 2022). There are few corresponding studies on the mechanisms of team learning climate on innovation performance. Therefore, this study will systematically examine the impact of team learning climate on innovation performance.

The ability to utilize existing knowledge and information to produce different combinations and reconfigurations is the source of innovation (Liu and Chan, 2017), which is also known as knowledge integration capability. By continuously creating a climate for learning, the team encourages the exchange of knowledge and ideas among its members and enhances their knowledge integration, which, in turn, promotes the generation of new knowledge and innovation (Lau and Ngo, 2004). It has been pointed out that the stronger the knowledge integration capability, the stronger the ability of the company to develop new products, respond to new situations, and enhance creativity (Wang et al., 2018). Knowledge integration facilitates teams to quickly identify new opportunities, assimilate internal and external knowledge, and then reorganize and innovate knowledge to enrich the existing knowledge base, contributing to innovative products (Gong et al., 2022). Therefore, this study will introduce knowledge integration capability to explore the mediating mechanism between team learning climate and innovation performance.

In summary, this study establishes a conceptual framework based on previous findings and theoretical gaps found in the literature, and investigate the relationship among team learning climate, knowledge integration capability and innovation performance, and the role of knowledge integration capability in the above mechanisms from the following aspects: Firstly, we analyze the impact of team learning climate on innovation performance. Then, knowledge integration capability is incorporated into the research framework to analyze the impact of team learning climate on knowledge integration capability and the impact of knowledge integration capability on innovation performance, and to explore the mediating role of knowledge integration capability. Finally, data from company employees were collected by distributing an electronic version of the questionnaire, and linear regression analysis and other methods were used to verify the hypotheses and draw conclusions.

The value of this study is to explain the direct relationship between team learning climate and innovation performance and to analyze the mediating role of knowledge integration capability. In brief, the findings complement the mechanism of team learning climate on innovation performance and suggest that team learning climate plays a positive role in innovation performance; expand the research perspective of knowledge integration capability, which plays a partially mediating role; and provide a new direction for the improvement of innovation performance in Chinese SMEs.

2. Literature background

2.1. Team learning climate

Research on climate emerged in the late 1960s and became common in fields such as organizational psychology and organizational behavior (Schneider et al., 2011). Schneider believes that climate is the common perception of policies and procedures in an organization that can be easily observed and measured (Schneider, 1990). Since then, research on organizational climate has extended to many types, among which the impact of learning climate on the development of adaptive capacity and the ability of individuals and teams to cope is crucial (Westerberg and Hauer, 2009). Nikolova defines learning climate as the common perception of employees about organizational policies that support, promote and reward learning behaviors (Nikolova et al., 2016). And when employees perceive that the organization supports them in their efforts to learn on the job, they are more likely to actively interact and learn to accomplish their tasks (Hirak et al., 2012). Previous research supports this idea. Armstrong argues that a prerequisite for organizations to generate significant outcomes is the construction of a learning environment that enhances employees' intent to learn and encourages their active participation in learning activities (Armstrong-Stassen and Schlosser, 2011). Kyndt found that organizations showing prior support for learning behaviors can enhance employees' intentions to learn, improve existing knowledge and skills, and opportunities to develop new knowledge and skills (Kyndt et al., 2013).

Despite the theoretical emphasis by scholars on the importance of learning climate, empirical studies on how team learning climate promotes innovation performance are still lacking. Previous studies on organizational climate on innovation performance have focused on supportive climate and rules climate (García-Buades et al., 2015), innovation climate (Waheed et al., 2019) and knowledge hiding climate (Haar et al., 2022). The mechanism of influence of team learning climate is not very clear.

2.2. Knowledge integration capability

knowledge as a static resource that cannot be used directly. Only within the team through understanding, absorption and memory can knowledge rise from perceptual awareness to rational thinking, thus forming innovative thinking (Alavi and Leidner, 2001). Knowledge integration is not a simple superimposition of knowledge, but a dynamic coupling of knowledge elements through the dynamic flow of acquired knowledge within the team (Mehrabani and Shajari, 2012). Mehrabani proposes a model of knowledge integration based on knowledge absorption, where

he argues that knowledge integration can filter foreign information and resources and reorganize their use after understanding them.

With the popularity of capability theory, some scholars have tried to elevate the concept of knowledge integration to the level of organizational capability. Kogut believes that knowledge integration capability is the ability to use existing knowledge to reorganize and innovate (Kogut and Zander, 1992). Ramesh summarizes knowledge integration capability as the ability of organizations to combine the knowledge possessed by individual members and reorganize it into the knowledge needed for a specific goal (Ramesh and Tiwana, 2001). Based on the characteristics of the digital economy, Liu argues that in the era of information explosion, knowledge integration capability is the ability to filter, process, and reorganize various fragments of information and resources inside and outside the team and perform knowledge innovation (Liu and Du, 2018).

In general, although scholars have interpreted knowledge integration capability in a large number of ways based on different perspectives, their understanding of the meaning of knowledge integration capability is basically the same. It is all about acquiring various types of knowledge and then reorganizing and even innovating them through the members' understanding and absorption to ensure the core competitiveness of the organization.

2.3. Innovation performance

As one of the important ways to solve problems and maintain competitive advantage, scholars have been paying great attention to the research about innovation. Muller believes that innovation can lead to new products, new services, and other results, which in turn can improve business performance, market returns (Muller and Peres, 2019). Ustalar defines innovation performance as the synthesis of the output performance of a company using knowledge technologies in innovation activities in daily production operations (Ustalar and Şanlisoy, 2020). On the other hand, some scholars consider the set of activities that produce something new as innovation, and innovation performance as all the outcomes that result from this process. For example, Li believes that knowledge accumulated during the innovation process can enhance innovation performance, and such accumulated knowledge is itself an invisible innovation outcome (Li et al., 2018). To sum up, this study summarizes innovation performance as the results of new ideas, new models, new products, and new technologies generated in the innovation process.

3. Hypothesis development

3.1. Team learning climate and knowledge integration capability

The digital economy distinguishes itself by its focus on the flow of digital resources and the emphasis on value co-creation. That is to say, it lays, the emphasis on knowledge flow, knowledge exchange and knowledge sharing. In a high team learning climate, the team is keen to create an environment conducive to knowledge exchange and knowledge sharing for its members, provides learning opportunities, and encourages team members to collaborate and communicate with each other and actively solve problems on a continuous basis (Eldor and Harpaz, 2016). Based on social information processing theory, the behavior and activities of individuals are influenced by the external environment in addition to their individual needs (Pfeffer, 1978). With a strong team learning climate, team members' inner desire for knowledge grows stronger and they realize the importance of knowledge for work and innovation, thus enhancing their knowledge integration capability.

Knowledge is held by individuals and if knowledge mobility and knowledge innovation are desired, existing competencies should be reorganized to learn new knowledge and skills (Kogut and Zander, 1992). Harvey argued that once a team learning climate is formed, members agree that continuous learning and self-development are team goals, and they motivate members to actively engage in learning behaviors (Harvey et al., 2019). Meanwhile, the conflict between individual and team interests is weakened by the material and spiritual incentives of the team, which enhances the willingness to share knowledge among members and continuously motivates them to acquire and innovate knowledge (Gara Bach Ouerdian et al., 2017). Therefore, team learning climate, as a shared perception, has a positive impact on both team members' willingness to share knowledge and their capability to integrated knowledge.

Based on the discussion, the following hypothesis is proposed:

> *H1*: Team learning climate is positively correlated with knowledge integration capability.

3.2. Team learning climate and innovation performance

Through the learning and utilization of information and knowledge, the actions of team members, such as applying new thinking, proposing new models or developing new products, can enhance the core competitiveness of the team and bring intangible and tangible economic benefits to the team, the company and society (Hwangbo et al., 2022). Some scholars have found that team learning climate offers members opportunities for knowledge exchange, feedback, and helps them make deeper connections between their work and team goals (Cangialosi et al., 2020). In such a climate, members perceive their roles and tasks to be fluid among themselves and other team members, and easily changed through mutual learning. As a result, members can easily handle their work based on the knowledge and skills they have learned from their team members. In addition, team learning climate provides greater opportunities and challenges for members, fostering a sense of accomplishment and emotional attachment to the team such as a sense of identity and responsibility (Eldor and

Harpaz, 2016). These positive emotions motivate members to remain rational in the face of problems and believe that they can accomplish their goals (Gable and Dreisbach, 2021). At this point, team members demonstrate excellent extended thinking, which enhances innovation performance.

Teams in high learning climate are conducive to creative participation of members. In team learning climate, the team provides emotional support, technical support, and creative support for members' innovative learning activities, and members feel a sense of organizational support, which enhances their intrinsic motivation and leads to members' active engagement in innovative behavior, goal accomplishment, and their overcoming of difficulties and challenges without fear of using creativity (Cerasoli and Ford, 2014), thus improving the innovation performance. According to self-determination theory, high team learning climate in which members feel organizational support enhances members' intrinsic drive and sense of responsibility, thus prompting members to aspire to be in continuous positional challenges in improving themselves. Meanwhile, resource conservation theory states that team learning climate as a resource, members with more of this resource will be more actively engaged in their work to better preserve and acquire resources, such as conducting innovative activities to gain innovation performance to form a positive spiral structure of resource accumulation (Inkpen, 1996).

Based on the discussion, the following hypothesis is proposed:

> *H2*: Team learning climate is positively correlated with innovation performance.

3.3. Knowledge integration capability and innovation performance

The development of the digital economy has made information exchange easier, reduced the cost of searching for information, and accelerated knowledge sharing, which consequently increases the efficiency of transforming knowledge into innovative products (Lyytinen et al., 2015). According to the knowledge-based theory of the firm, the maintenance of a firm's core competitive advantage depends on the efficiency of its teams in transforming knowledge, information and technology (Crescenzi and Gagliardi, 2018). Knowledge integration capability can help teams promote the rapid flow, sharing, application, and innovation of knowledge among members, and improve the understanding and utilization efficiency of external knowledge as well as internal members' knowledge (Martini et al., 2017). When members' knowledge integration capability is enhanced, they can easily integrate external fragmented knowledge and their own knowledge to reorganize and innovate into a new knowledge system, which lays the foundation for members' innovative behavior. Moreover, when facing sudden environmental changes and conflicts, knowledge integration capability can help enhance technical strength, broaden knowledge stock, and motivate members and teams to conduct product innovation and market planning more efficiently (Zobel et al., 2017).

Domestic and foreign scholars have made numerous studies on knowledge integration capability, and generally agree that knowledge integration capability and innovation performance are positively correlated. Ritala argues that integrating expertise among team members in order to adapt to a specific context allows teams to plan products more efficiently to facilitate product innovation (Ritala et al., 2017). Moreover, Wang argued that teams have good performance in innovation projects such as technological innovation if they are able to acquire new knowledge and integrate old knowledge that already exists within the team, i.e., the stronger the knowledge integration capability, the better the team innovation performance (Zhao, 2022).

Based on the discussion, the following hypothesis is proposed:

> *H3*: knowledge integration capability is positively correlated with innovation performance.

3.4. The mediating role of knowledge integration capability

In the face of open innovation in the digital economy, the high-speed flow of knowledge workers promotes the interaction of information, while the important way for team members to improve the efficiency of their own innovation is precisely to enhance the ability to utilize information and learn from knowledge (Akcigit and Kerr, 2018). The access of team members to knowledge and the strength of their knowledge integration skills are also influenced by the learning climate and the external knowledge environment (Boh and Wong, 2013). Members in high team learning climate can more easily gather and decode information that can be converted and innovated into knowledge, expertise and decisions (Cauwelier et al., 2019). Companies rely on these members to help teams think beyond existing inertia, better assess the value of new information in a specific field, selectively choose new knowledge and skills based on the needs of the innovation, reduce uncertainty about the innovation, and give practical meaning and application to the innovation product (Men et al., 2018).

Based on the definition and role of knowledge integration capability and scholars' researches, this study combined hypothesis H1: team learning climate is positively related to knowledge integration capability, and hypothesis H3: knowledge integration capability is positively related to innovation performance, and inferred that team learning climate may enhance innovation performance by improving team members' knowledge integration capability.

Based on the discussion, the following hypothesis is proposed:

> *H4*: Knowledge integration capability play a mediating role in team learning climate and innovation performance.

3.5. The hypothesis model

In summary, the theoretical model of this study is shown in Figure 1.

4. Methodology and data analysis

4.1. Participants and procedures

The purpose of this study is to examine the relationship among team learning climate, knowledge integration capability, and innovation performance. In order to obtain a larger and more representative sample, employees working in R&D technology, market research and market planning were selected. The procedures were as follow: To begin with, we found a contact person for each position in each company to clarify the purpose and content of the questionnaire to reduce their resistance to the study. An online questionnaire was then sent to each participant detailing the study and the anonymization system, and the participants were asked to carefully review the questions and reply.

Therefore, in this study, questionnaires were sent to 208 employees in September 2022, who answered questions on the control variable, the independent variable (team learning climate), the dependent variable (innovation performance), and the mediator (knowledge integration capability). The returned questionnaires were analyzed to eliminate incomplete or inconsistent questionnaires, and 184 valid questionnaires were retrieved, with an effective rate of 88.46%. Demographic data revealed that: the sample was composed mainly of women (66.3%), compared to (33.7%) of man. The predominant age profile was 18 to 30 years old (76.6%), while the proportion of the participants over 50 years old was only 1.92%. The sample size of undergraduate and graduate and above accounted for 67.9 and 25.0% respectively, which indicates that the respondents generally have a high level of education. In the working years, the sample size of those who worked for less than 3 years accounted for 79.3%.

4.2. Measures

The measures used in this study was to design a questionnaire based on existing established scales, using the principle of a 5-point Likert scale, with five levels from 1 to 5 representing "strongly disagree" to "strongly agree" respectively.

4.2.1. Team learning climate

A six-item scale designed by Spara (2007) was used to classify team learning climate (TLC) into active exploration of learning, provision of support and opportunities, appreciation and encouragement to reflect employees' perceptions of team learning climate. Respectively items, such as "Members of this team spend a lot of time learning new things," "The top management of this team really supports team members' efforts to develop ourselves" and "Members of this team get rewarded for acquiring new skills." The mean coefficient alpha was 0.819.

4.2.2. Knowledge integration capability

The scale designed by Liu and Du (2018) was used, which is subcategorized into Knowledge Recognition Capability (KR), Knowledge Contribution Capability (KC), Knowledge Fusion Capability (KF) and Knowledge Utilization Capability (KU). The scale contained a total of 12 items, such as "Our team members are well aware of the knowledge and skills we possess," "Our team members have access to the knowledge needed from relevant materials within the team," "Our team members have the ability to reassemble internal knowledge for new product development," and "Our team members are able to apply new knowledge to solve new problems." The mean coefficient alpha was 0.873.

4.2.3. Innovation performance

Using the innovation performance (IP) scale complied by Janssen (2000). The scale has 9 items such as "Members often translate new ideas into useful practice" and "Members often come

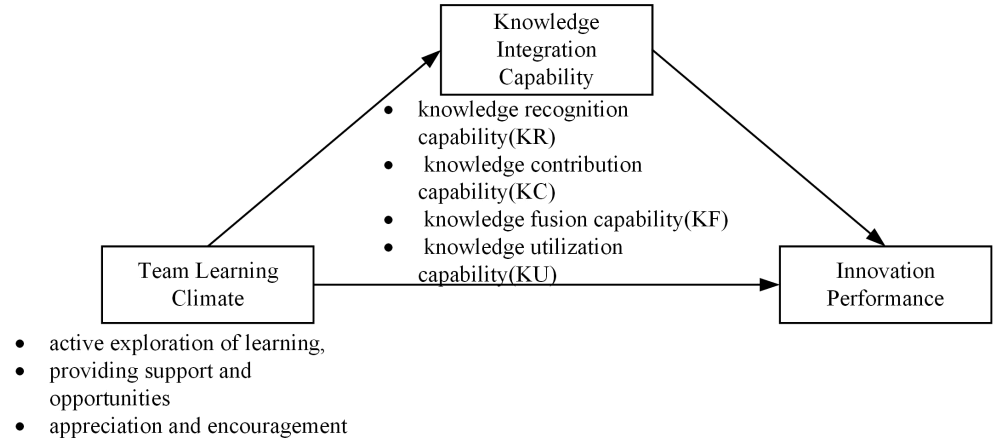

FIGURE 1
The hypothesis model.

up with creative solutions to problems." The mean coefficient alpha was 0.879.

4.2.4. Control variables

Considering the previous studies, five control variables (gender, age, education background, working years and working position) were selected.

5. Results of data analysis

5.1. Data analysis

For the data analysis and the validation of the hypotheses, regression analysis, which requires a low number of data samples, was used. To determine the minimum sample size for the linear regression model of this study, calculations were carried out using the PASS software designed by NSCC with reference to the tables and theory provided by Cohen (1988) and Gatsonis and Sampson (1989). The results indicated that the minimum sample was 50. Therefore, a total of 184 valid samples were obtained for this study, which could be analyzed by linear regression. In linear regression, a linear relationship between the independent and dependent variables is required; the errors obey a normal distribution with a mean of zero; and there is no collinearity between the variables. The variables in this study met the above requirements.

The basic process of the testing is divided into the following steps: firstly, the variables such as gender, age, education, and years of work are controlled for. Secondly, the reliability and validity of the factors in the measurement scales were examined to assess the quality of the model. Finally, a hypothesis testing is performed, in which the significance test of mediating effects is done by Bootstrapping.

In this study, the sample data were analyzed using SPSS and Amos software, which are among the most common software used to perform measurement model quality tests and regression analyses.

5.2. Measurement model

As mentioned above, this study first analyzed the reliability of the items of the measurement scale. And this was done by calculating the Cronbach's α and Corrected Item-Total Correlation (CITC). The Cronbach's α was originally proposed by Nunnally and Bernstein (1994) and has a minimum allowable value of 0.7. Loiacono et al. (2002) proposed to remove items whose elimination would improve Cronbach's α by checking the CITC value, which has a minimum value of 0.4. In the pretest questionnaire, the CITC value for question item KR4 in the knowledge integration capability was −0.091 and the correlation was only 0.07, so the deletion of KR4 was considered, and the Cronbach's α for the knowledge integration competency improved from 0.858 to 0.873 after the deletion of KR4. As shown in Table 1, the Cronbach's α for the variables analyzed were all greater than 0.7, indicating that all variables were reliable.

Furthermore, the variables were examined by KMO test and Bartlett's spherical test for suitability for factor analysis, that is, to test whether each variable is independent of the other. KMO test is used to check the correlation and bias correlation among variables. When KMO value is above 0.8, it means that the sample size is sufficient. And when Sig. <0.05 ($p < 0.05$), it means that the data are spherically distributed and the variables are independent of each other to some degree, and factor analysis can be performed(Vogt and Johnson, 2011).

After the reliability analysis was completed, this study adopted confirmatory factor analysis (CFA) to assess the validity of all variables. All variables were loaded onto their respective latent variables (team learning climate, knowledge integration capability, and innovation performance), as shown in Figures 2–4. Wen (Zhong-Lin et al., 2004) considered that the model fitted well when the variables satisfied a criteria of $\chi^2/df > 3$, $p < 0.001$, GFI > 0.8, CFI > 0.8, NFI > 0.8, AGFI > 0.8, IFI > 0.8, RMSEA < 0.1, RMR < 0.5. The results of CFA are shown in Table 2.

5.3. Descriptive statistics and correlation analysis

Before the hypothesis testing, this study conducted the necessary descriptive statistics and correlation analysis on the basic characteristics of the data. The results of descriptive statistics and Pearson correlation analysis for each variable are shown in Table 3. Team learning climate is positively associated with innovation performance ($r = 0.662$, $p < 0.01$) and with innovation performance ($r = 0.703$, $p < 0.01$). Knowledge integration capability is positively associated with innovation performance ($r = 0.680$, $p < 0.01$). This preliminarily verifies the relevant hypothesis of this study. Meanwhile, the correlation coefficients were all greater than 0.5 and less than the allowed value of 0.75 for multicollinearity (Tsui et al., 1995). As a result, this study concluded that there is no serious collinearity among the variables and that regression analysis could be performed on the data.

5.4. Hypothesis testing

The hypotheses were tested with the help of regression model constructed by empirical methods. The measured variables were processed and then included in a linear regression model to analyze the specific relationships among the different variables, from which the significance was examined to determine whether the hypotheses were valid. In this section, the effect of team learning climate on knowledge integration capability, innovation performance, is first examined. Secondly, to test the effect of knowledge integration capability on innovation performance. Finally, the mediating role of knowledge integration capability between team learning climate and innovation performance is verified.

TABLE 1 Results of reliability test.

Variables	Items	CITC	KMO	Sig.	Cronbach's α after deletion of item	Standardized α	Treatment
Team learning climate			0.839	$p < 0.001$		0.819	
	TLC1	0.683			0.769		Reservation
	TLC2	0.592			0.785		Reservation
	TLC3	0.606			0.782		Reservation
	TLC4	0.526			0.8		Reservation
	TLC5	0.567			0.791		Reservation
	TLC6	0.525			0.8		Reservation
Knowledge integration capacity			0.878	$P < 0.001$		0.858	
Knowledge recognition capacity	KR1	0.473			0.829		Reservation
	KR2	0.458			0.83		Reservation
	KR3	0.555			0.823		Reservation
	KR4	−0.091			0.872		Deletion
Knowledge contribution capability	KC1	0.614			0.821		Reservation
	KC2	0.589			0.821		Reservation
	KC3	0.624			0.817		Reservation
Knowledge fusion capability	KF1	0.499			0.827		Reservation
	KF2	0.58			0.821		Reservation
	KF3	0.525			0.825		Reservation
Knowledge utilization capacity	KU1	0.59			0.82		Reservation
	KU2	0.526			0.825		Reservation
	KU3	0.59			0.82		Reservation
Innovation performance			0.894	$P < 0.001$		0.879	
	IP1	0.619			0.867		Reservation
	IP2	0.647			0.864		Reservation
	IP3	0.597			0.869		Reservation
	IP4	0.67			0.861		Reservation
	IP5	0.575			0.871		Reservation
	IP6	0.643			0.864		Reservation
	IP7	0.69			0.859		Reservation
	IP8	0.695			0.859		Reservation

The results of the analysis are shown in Table 4, where team learning climate positively influenced knowledge integrate capability ($\beta = 1.132$, R2 = 0.462, $F = 156.522$, $p < 0.001$), team learning climate positively influenced innovation performance ($\beta = 1.132$, R2 = 0.462, F = 156.522, $p < 0.001$), knowledge integrate capability positively influenced innovation performance ($\beta = 1.132$, R2 = 0.462, F = 156.522, $p < 0.001$). Therefore, H1, H2, H3 were verified.

The mediating role was verified by using the hierarchical regression method proposed by Baron and Kenny (1986). We first introduce the mediating variable (knowledge integration capability) based on the assumption that H2 is valid, and test the regression coefficient magnitude of the independent and mediating variables and whether they are significant. As can be seen in Table 5, the positive effect of the independent variable (team learning climate) on the dependent variable (innovation performance) remains significant ($\beta = 0.462$, $p < 0.001$). However, the regression coefficient β decreases from 0.896 in Table 4 to 0.462 in Table 5, and the effect is significantly weaker. And the mediating variable (knowledge integration capability) positively affects innovation performance ($\beta = 0.383$, $p < 0.001$). Therefore, knowledge integration capability plays

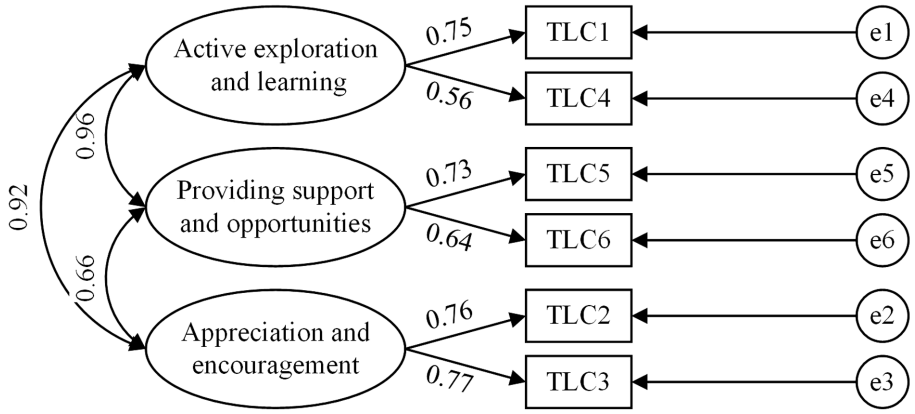

FIGURE 2
Confirmatory factor analysis model of Team Learning Climate.

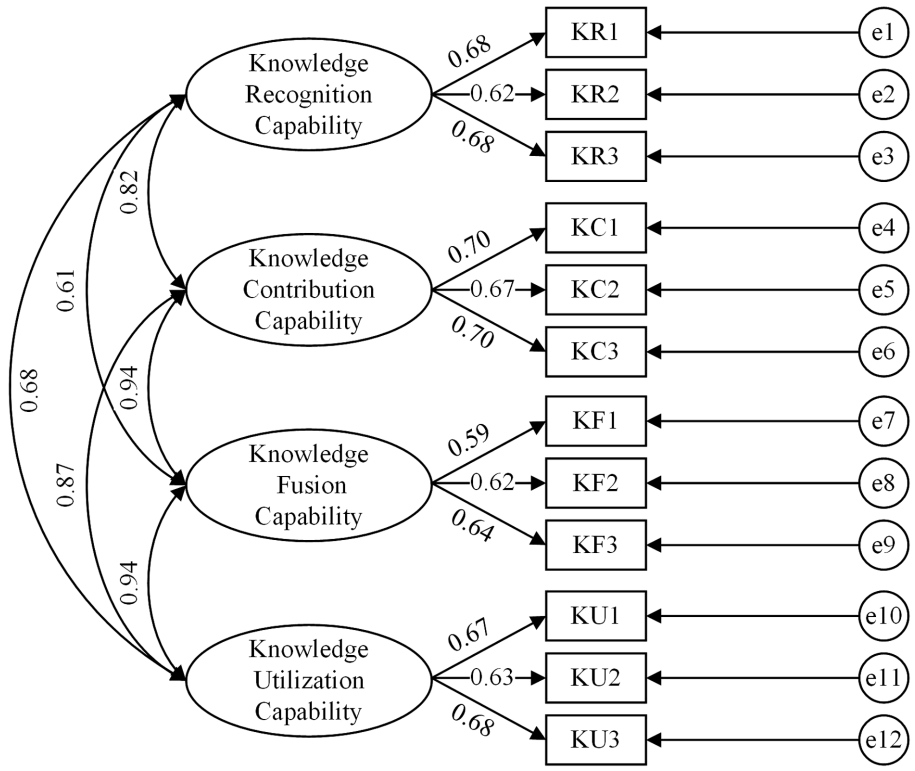

FIGURE 3
Confirmatory factor analysis model of Knowledge Integration Capability.

a partial role in team learning climate and innovation performance. H4 was verified.

The significance of the mediating role of knowledge integration capability was further verified by Bootstrap test. Setting up repeated sampling from the original sample 5,000 times, the results in Table 6 show that: The 95% confidence interval was [0.2598, 0.6441], and the interval did not contain 0. Thus, the mediating role of knowledge integration capability is significant, and H4 is further tested.

6. Discussion

The digital economy has reduced the cost of information acquisition, search and replication (Goldfarb and Tucker, 2019), and accelerated the flow of knowledge, leading to the need for extremely strong knowledge integration mechanisms for enterprise innovation. In this case, how to actively build team climate and encourage team members to integrate knowledge is

the key to improve innovation performance. In view of this, this study constructed a theoretical model of team learning climate – knowledge integration capability – innovation performance to analyze the influence of team learning climate on innovation performance and the mediating role of knowledge integration capability.

6.1. Theoretical implications

It has been confirmed that building supportive contexts can enhance innovation performance (Wu et al., 2019), but the specific mechanism of team learning climate as a supportive context on innovation performance has been less studied. Therefore, according to the characteristics of team learning climate that support members in knowledge sharing (Schein, 2004), we investigate the relationship between team learning climate and innovation performance from the perspective of knowledge integration capability.

The results of the study indicate that team learning climate positively influences innovation performance. This is similar to the findings of Montani et al. (2023) that when organizations express a high level of support for innovation, firm innovation performance is ultimately enhanced. When the team signals to its members that the team encourages and appreciates their learning behavior and provides them with the corresponding emotional, technical and resource support, the team members can perceive the environment, actively integrate external information, broaden their knowledge and generate new ideas, skills and methods, which in turn strengthens their ability to cope with the new and increasingly competitive situation and enhances their creativity. This study examines the impact on innovation performance through the perspective of team learning climate, which is conducive to expanding the study of factors influencing innovation performance.

Knowledge integration capability partially mediates the relationship between team learning climate and innovation performance. This suggests that team learning climate can have both a direct positive impact on innovation performance and indirectly enhance innovation performance through knowledge integration capability. Previous research has discussed the impact of individual perceived team learning climate on creativity based on resource conservation theory (Eldor and Harpaz, 2016), which provides some basis for an in-depth study in this research. This study verified the mediating role of knowledge integration capability in team learning climate and innovation performance based on social information processing theory. The findings enrich and deepen the study of mediating factors in the influence mechanism of team learning climate on innovation performance.

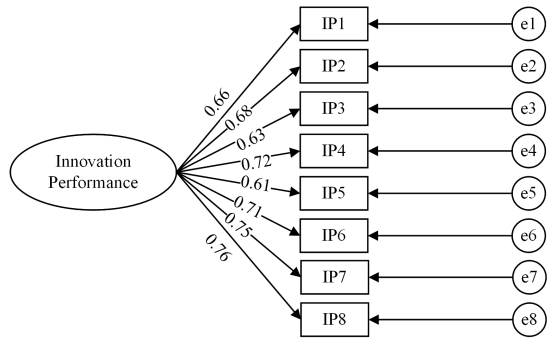

FIGURE 4
Confirmatory factor analysis model of Innovation Performance.

6.2. Practical implications

With the arrival of the digital economy era, China implements the innovation-driven development strategy, and drives enterprises to invest in innovation and enhance their core competitiveness. Open innovation thinking can help companies to quickly conduct innovative R&D, get rid of overcapacity and adapt to complex environments. On the basis of the results of the empirical study, the main contributions, innovation and practical implications introduced in this study are as follows:

First of all, in accordance with the digital economy's emphasis on knowledge flow, knowledge exchange and knowledge sharing, managers should promote the climate of team knowledge sharing and form a resource base of team knowledge stock by carrying out

TABLE 2 Fitting index of confirmatory factor analysis.

Variables	χ^2	χ^2/df	GFI	CFI	NFI	AGFI	IFI	RMSEA	RMR
Team learning climate	3.672	0.612	0.993	0.993	0.989	0.977	1.000	0.003	0.018
Knowledge recognition capability	103.576	2.518	0.915	0.923	0.868	0.862	0.924	0.080	0.081
Innovation performance	51.024	2.511	0.935	0.948	0.918	0.883	0.949	0.092	0.041

TABLE 3 Results of correlation.

Variables	Correlation	Innovation performance	Team learning climate	Knowledge recognition capability
Team learning climate	Pearson Correlation	1.000		
Knowledge recognition capability	Pearson Correlation	0.622**	1.000	
Innovation performance	Pearson Correlation	0.703**	0.680**	1.000

**$p < 0.01$.

TABLE 4 Results of Regression analysis.

Variables	Knowledge recognition capability		Innovation performance		Innovation performance	
	β	T	β	T	β	T
Team learning climate	1.132	12.511***			0.896	11.905***
Knowledge recognition capability			0.571	13.342***		
R	0.462		0.494		0.438	
Adj. R^2	0.459		0.492		0.435	
F	156.522***		178.003***		141.722***	

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

TABLE 5 Regression analysis of mediating effects.

Variable types	Variables	Innovation performance	
		β	T
Independent variable	Team learning climate	0.462	5.060***
Mediating variables	Knowledge recognition capability	0.383	6.982***
Regression model index	R	0.557	
	Adj. R^2	0.552	
	F	113.831***	

***$p < 0.001$.

external conditions such as seminars, academic sharing and professional knowledge lectures. In addition, the learning behavior among members is appreciated and motivated, for example, by specifying innovation-related indicators in the assessment system, so as to strengthen members' perception of the team learning climate as an environmental factor.

Second, knowledge integration capability is divided into four dimensions: knowledge recognition, knowledge contribution, knowledge fusion and knowledge utilization, and enhancing knowledge integration capability requires comprehensive enhancement of these four dimensions. Knowledge recognition helps to target the most valuable information and knowledge to the team in the information explosion. Knowledge contribution refers to the process and behavior of knowledge holders to provide and create knowledge, and knowledge contribution among members helps to improve the whole knowledge base and facilitate others to learn knowledge. Knowledge fusion can help transform the absorption of external information and knowledge for your own use. Knowledge utilization is most important in practice, and the practical application of knowledge to new ideas, new technologies and new products is what completes the act of innovation. Therefore, managers should focus on the development of knowledge integration capability to enhance innovation performance.

Third, during their working processing, team members should focus on communication and interaction with other members and actively build and maintain relationships in order to establish good relationships within the team members. Guarantee the effectiveness of communication between managers and team members in order to build a harmonious and united team climate. This facilitates team members to devote themselves to creative work and achieve a qualitative change and leap in team creativity.

6.3. Limitation and future research

There are certain limitations in this study. Firstly, the cross-sectional data we took could not clarify the causal relationship among the variables. Therefore, future studies can use longitudinal studies to determine the causal relationships among variables. Secondly, although this study strives for sample diversity in sending questionnaires to collect data on knowledge workers in different regions of China, it may still produce sampling errors that make the samples more similar in some characteristics. This limits the universality of the findings, and the results may not be applicable to all types of team members. In the future, thus, the sample size can be further expanded to examine

TABLE 6 Results of Bootstrap program.

Direct effect	SE	T	95% Confidence interval	Indirect effect	SE	95% confidence interval
0.4620***	0.0752	11.9047	[0.7471,1.0439]	0.4335***	0.0983	[0.2598,0.6441]

***$p < 0.001$.

the effects of different types of corporate environments, to achieve diversified data collection, and to improve the universality and application value of research findings. Finally, the knowledge integration capability in this study only plays a partial mediating role, which indicates that there are other mediating factors in the influence mechanism of team learning climate on innovation performance. Other mediating factors can be searched for and studied in more depth in the future.

Data availability statement

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

Author contributions

M-SL and JL proposed the research topic and designed the questionnaire. JL authored and revised the manuscript. M-SL and J-ML reviews the manuscript. J-ML, Z-WL, and X-TD conducted the questionnaire and collected and organized the data. 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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References

Akcigit, U., and Kerr, W. R. (2018). Growth through heterogeneous innovations. *J. Polit. Econ.* 126, 1374–1443. doi: 10.1086/697901

Alavi, M., and Leidner, D. (2001). Review: knowledge management and knowledge management systems: conceptual foundations and research issues. *MIS Q.* 25:107. doi: 10.2307/3250961

Armstrong-Stassen, M., and Schlosser, F. (2011). Perceived organizational membership and the retention of older workers. *J. Organ. Behav.* 32, 319–344. doi: 10.1002/job.647

Baron, R. M., and Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *J. Pers. Soc. Psychol.* 51, 1173–1182. doi: 10.1037//0022-3514.51.6.1173

Boh, W. F., and Wong, S. S. (2013). Organizational climate and perceived manager effectiveness: influencing perceived usefulness of knowledge sharing mechanisms. *J. Assoc. Inf. Syst.* 14, 122–152. doi: 10.17705/1jais.00326

Cangialosi, N., Odoardi, C., and Battistelli, A. (2020). Learning climate and innovative work behavior, the mediating role of the learning potential of the workplace. *Vocat. Learn.* 13, 263–280. doi: 10.1007/s12186-019-09235-y

Cauwelier, P., Ribiere, V. M., and Bennet, A. (2019). The influence of team psychological safety on team knowledge creation: a study with French and American engineering teams. *J. Knowl. Manag.* 23, 1157–1175. doi: 10.1108/JKM-07-2018-0420

Cerasoli, C. P., and Ford, M. T. (2014). Intrinsic motivation, performance, and the mediating role of mastery goal orientation: a test of self-determination theory. *J. Psychol.* 148, 267–286. doi: 10.1080/00223980.2013.783778

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences (2nd ed.).* London: Routledge.

Crescenzi, R., and Gagliardi, L. (2018). The innovative performance of firms in heterogeneous environments: the interplay between external knowledge and internal absorptive capacities. *Res. Policy* 47, 782–795. doi: 10.1016/j.respol.2018.02.006

Eldor, L., and Harpaz, I. (2016). A process model of employee engagement: the learning climate and its relationship with extra-role performance behaviors. *J. Organ. Behav.* 37, 213–235. doi: 10.1002/job.2037

Gable, P. A., and Dreisbach, G. (2021). Approach motivation and positive affect. *Curr. Opin. Behav. Sci.* 39, 203–208. doi: 10.1016/j.cobeha.2021.03.030

Gara Bach Ouerdian, E., Mansour, N., al-Zahrani, A., and Chaari, A. (2017). Promoting knowledge sharing in Tunisian KIFs through HRM practices. The mediating role of human capital and learning climate. *Int. J. Hum. Resour. Manag.* 30, 2321–2359. doi: 10.1080/09585192.2017.1322117

García-Buades, M. E., Ramis-Palmer, C., and Manassero-Mas, M. A. (2015). Climate for innovation, performance, and job satisfaction of local police in Spain. *Policing: An Int. J. Police Strategies Manag.* 38, 722–737. doi: 10.1108/PIJPSM-02-2015-0019

Gatsonis, C., and Sampson, A. R. (1989). Multiple correlation: exact power and sample size calculations. *Psychol. Bull.* 106, 516–524. doi: 10.1037/0033-2909.106.3.516

Goldfarb, A., and Tucker, C. (2019). Digital Economics. *J. Econ. Lit.* 57, 3–43. doi: 10.1257/jel.20171452

Gong, Y., Yao, Y., and Zan, A. (2022). The too-much-of-a-good-thing effect of digitalization capability on radical innovation: the role of knowledge accumulation and knowledge integration capability. *J. Knowl. Manag.* doi: 10.1108/jkm-05-2022-0352 [Epub ahead of print].

Haar, J., O'Kane, C., and Cunningham, J. A. (2022). Firm-level antecedents and consequences of knowledge hiding climate. *J. Bus. Res.* 141, 410–421. doi: 10.1016/j.jbusres.2021.11.034

Harvey, J.-F., Johnson, K. J., Roloff, K. S., and Edmondson, A. C. (2019). From orientation to behavior: the interplay between learning orientation, open-mindedness, and psychological safety in team learning. *Hum. Relat.* 72, 1726–1751. doi: 10.1177/0018726718817812

Hirak, R., Peng, A. C., Carmeli, A., and Schaubroeck, J. M. (2012). Linking leader inclusiveness to work unit performance: the importance of psychological safety and learning from failures. *Leadersh. Q.* 23, 107–117. doi: 10.1016/j.leaqua.2011.11.009

Hwangbo, Y., Shin, W.-J., and Kim, Y. (2022). Moderating effects of leadership and innovation activities on the technological innovation, market orientation and corporate performance model. *Sustainability* 14:6470. doi: 10.3390/su14116470

Inkpen, A. C. (1996). Creating knowledge through collaboration. *Calif. Manag. Rev.* 39, 123–140. doi: 10.2307/41165879

Janssen, O. (2000). Job demands, perceptions of effort-reward fairness and innovative work behaviour. *J. Occup. Organ. Psychol.* 73, 287–302. doi: 10.1348/096317900167038

Kogut, B., and Zander, U. (1992). Knowledge of the firm, combinative capabilities, and the replication of technology. *Organ. Sci.* 3, 383–397. doi: 10.1287/orsc.3.3.383

Kyndt, E., Govaerts, N., Claes, T., De La Marche, J., and Dochy, F. (2013). What motivates low-qualified employees to participate in training and development? A mixed-method study on their learning intentions. *Stud. Contin. Educ.* 35, 315–336. doi: 10.1080/0158037X.2013.764282

Lau, C. M., and Ngo, H. Y. (2004). The HR system, organizational culture, and product innovation. *Int. Bus. Rev.* 13, 685–703. doi: 10.1016/j.ibusrev.2004.08.001

Li, M., Liu, H., and Zhou, J. (2018). G-SECI model-based knowledge creation for CoPS innovation: the role of grey knowledge. *J. Knowl. Manag.* 22, 887–911. doi: 10.1108/JKM-10-2016-0458

Liu, A. M. M., and Chan, I. Y. S. (2017). Critical role of the learning transfer climate in fostering innovation in construction. *J. Manag. Eng.* 33:04016050. doi: 10.1061/(ASCE)ME.1943-5479.0000482

Liu, Z., and Du, R. (2018). Research on relationship among entrepreneurial team knowledge heterogeneity, knowledge integration capacity and team creativity. *Science Technol. Manag. Res.* 8, 159–167. doi: 10.3969/j.issn.1000-7695.2018.08.023

Loiacono, E., Watson, R., and Goodhue, D. L. (2002). WEBQUAL: a measure of website quality, 2002 marketing educators. *Marketing Theory and Applications* 13, 432–437.

Lyytinen, K., Yoo, Y., and Boland, R. J. Jr. (2015). Digital product innovation within four classes of innovation networks. *Inf. Syst. J.* 26, 47–75. doi: 10.1111/isj.12093

Martini, A., Neirotti, P., and Appio, F. P. (2017). Knowledge searching, integrating and performing: always a tuned trio for innovation? *Long Range Plan.* 50, 200–220. doi: 10.1016/j.lrp.2015.12.020

Mehrabani, S., and Shajari, M. (2012). Knowledge management and innovation capacity. *J. Manag. Res.* 4:1390. doi: 10.5296/jmr.v4i2.1390

Men, C., Luo, J., Fong, P. S. W., Zhong, J., and Huo, W. (2018). Translating external knowledge to team creativity in turbulent environments: the role of absorptive capacity and knowledge integration. *J. Creat. Behav.* 54, 363–377. doi: 10.1002/jocb.371

Montani, F., Staglianò, R., Sommovigo, V., Setti, I., and Giorgi, G. (2023). Managers' compassionate goals, innovation, and firm performance: an examination of mediating processes, and boundary conditions in small- and medium-sized enterprises. *R&D Manag.* 53, 97–114. doi: 10.1111/radm.12549

Muller, E., and Peres, R. (2019). The effect of social networks structure on innovation performance: a review and directions for research. *Int. J. Res. Mark.* 36, 3–19. doi: 10.1016/j.ijresmar.2018.05.003

Nikolova, I., Ruysseveldt, J. V., Dam, K. V., and Witte, H. D. (2016). Learning climate and workplace learning: Does work restructuring make a difference? *J. Pers. Psychol.* 15, 66–75. doi: 10.1027/1866-5888/a000151

Nunnally, J. C., and Bernstein, I. H. (1994). *Psychometric theory 3E*. McGraw-Hill.

Peng, J.-C., and Chen, S.-W. (2022). Learning climate and innovative creative performance: exploring the multi-level mediating mechanism of team psychological capital and work engagement. *Curr. Psychol.* 1–19.doi: 10.1007/s12144-021-02617-3

Pfeffer, J., and Salansik, G. R. (1978). A social information processing approach to job attitudes and task design. *Adm. Sci. Q.* 23, 224–253. doi: 10.2307/2392563

Pigola, A., and Da Costa, P. R. (2022). In search of understanding about knowledge and learning on innovation performance. *Scientometrics* 127, 3995–4022. doi: 10.1007/s11192-022-04417-3

Ramesh, B., and Tiwana, A. (2001). Integrating knowledge on the web. *IEEE Internet Comput.* 5, 32–39. doi: 10.1109/4236.935173

Ritala, P., Huizingh, E., Almpanopoulou, A., and Wijbenga, P. (2017). Tensions in R&D networks: implications for knowledge search and integration. *Technol. Forecast. Soc. Chang.* 120, 311–322. doi: 10.1016/j.techfore.2016.12.020

Schein, E. H. (2004). Learning when and how to lie: a neglected aspect of organizational and occupational socialization. *Hum. Relat.* 57, 259–273. doi: 10.1177/0018726704043270

Schneider, B. (1990). *Organizational Climate and Culture*. ed. S. Zedeck Oxford: Jossey-Bass.

Schneider, B., Ehrhart, M. G., and Macey, W. H. (2011). "Perspectives on organizational climate and culture" in *APA handbook of industrial and organizational psychology*, Building and developing the organization, vol. *1* (Washington, DC, US: American Psychological Association), 373–414.

Spara, E. G. (2007). Individual and unit level goal orientation as predictors of employee development. Dissertation, America(MD): University of Maryland.

Tripathi, A., and Kalia, P. (2022). Examining the effects of supportive work environment and organisational learning culture on organisational performance in information technology companies: the mediating role of learning agility and organisational innovation. *Innovations* 1-21, 1–21. doi: 10.1080/14479338.2022.2116640

Tsui, A. S., Ashford, S. J., Clair, L. S., and Xin, K. (1995). Dealing with discrepant expectations: response strategies and managerial effectiveness. *Acad. Manag. J.* 38, 1515–1543. doi: 10.5465/256842

Ustalar, S. A., and Şanlisoy, S. (2020). The impact of foreign direct investment on innovation performance: evidence from a nonlinear ARDL approach. *İzmir İktisat Dergisi.* 35, 77–89. doi: 10.24988/ije.202035106

Vogt, W. P., and Johnson, B. (2011). *Dictionary of statistics & methodology: A nontechnical guide for the social sciences*. Sage.

Waheed, A., Miao, X. M., Waheed, S., Ahmad, N., and Majeed, A. (2019). How new HRM practices, organizational innovation, and innovative climate affect the innovation performance in the IT Industry: a moderated-mediation analysis. *Sustainability* 11:621. doi: 10.3390/su11030621

Wang, M.-C., Chen, P.-C., and Fang, S.-C. (2018). A critical view of knowledge networks and innovation performance: the mediation role of firms' knowledge integration capability. *J. Bus. Res.* 88, 222–233. doi: 10.1016/j.jbusres.2018.03.034

Westerberg, K., and Hauer, E. (2009). Learning climate and work group skills in care work. *J. Work. Learn.* 21, 581–594. doi: 10.1108/13665620910996151

Wu, T. J., Yang, Y., and Yang, Y. J. (2019). Does supportive organisational climate enhance employee creativity? A case of ecotec industry. *J. Environ. Prot. Ecol.* 20, S486–S493.

Zhao, J. (2022). Coupling open innovation: network position, knowledge integration ability, and innovation performance. *J. Knowl. Econ.* 1–21. doi: 10.1007/s13132-022-00932-z

Zhong-Lin, W., Kit-Tai, H., and Marsh, H. W. (2004). Structural equation model testing: cutoff criteria for goodness of fit indices and chi-square test. *Acta Psychol. Sin.* 36, 186–194.

Zobel, A.-K., Lokshin, B., and Hagedoorn, J. (2017). Formal and informal appropriation mechanisms: the role of openness and innovativeness. *Technovation* 59, 44–54. doi: 10.1016/j.technovation.2016.10.001

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Implementation model of data analytics as a tool for improving internal audit processes

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Introduction: The aim of this article is to understand the importance of internal audit departments todays—part of corporate governance and guardian of the organisation's culture and climate—, as well as the opportunities that new technologies offer to increase their effectiveness and efficiency.

Methods: To this end, based on an exhaustive review of the literature, the concepts of internal audit and data analytics are related, and a framework is proposed for the implementation of a technology of these characteristics in an internal audit department.

Results: The results of the research show that those companies that invest resources in readapting their processes to technological change are likely to obtain better results than those organisations that keep their management procedures obsolete.

Discussion: Based on these results, it is concluded that there is a need to consider technological change in internal audit departments, specifically data analytics, to increase the effectiveness and efficiency of audit processes.

KEYWORDS

internal audit, internal audit function, data analytics, audit process automation, audit process improvement

1. Introduction

The modern origin of the internal audit function can be traced back to the financial scandals of the late 20th and early 21st century [the Enron, Tyco International or WorldCom scandals were particularly notorious (Drumea, 2008)]. History has shown that most major revolutions or changes in legislative oversight are preceded by an economic crisis or a financial scandal, and this was the case with the implementation of the Sarbanes-Oxley Act (SOX) in 2002 (Arjona-Canas et al., 2017).

The objective of the SOX Act encourages the participation and importance of auditors in the publication of transparent financial information (Fernández, 2007), which is why it is from this point onwards that internal audit departments took on special relevance.

The internal audit is an independent and objective assurance and consulting activity designed to add value and improve an organisation's operations. In addition, it helps the organisation to meet its objectives by providing a systematic and disciplined approach to assess and improve the effectiveness of risk management, control and governance processes (IAIE, Instituto de Auditores Internos de España, 2017). It is also essential to highlight the role played by the function in achieving organisational objectives by being part of the company's corporate governance, together with the audit committee, management, and external auditors (Gramling et al., 2004; Goodwin-Stewart and Kent, 2006). An internal audit, therefore, is a critical function in the task of control which helps to achieve corporate objectives.

Knowledge and understanding of the organisational culture play a key role in this task of defining and achieving objectives. On the one hand, organisational culture is the company's identity card, aimed at influencing the deeds and actions of its stakeholders for the achievement

of better business results (Panagiotis et al., 2014). In line with this idea, authors such as Gronewold and Donle (2011) argue that auditing the organisational climate and culture is an instrument that leads to a better understanding of stakeholder needs, engaging them at a strategic level, and leading to a better corporate image. In other words, organisational culture audits lead to better results.

On the other hand, information is a relevant resource to improve the decision-making process. In today's ever-changing society, business decisions are made based on the information available (Rathi and Betala, 2019). Adequate knowledge and treatment of such information, which allows for more effective and efficient use of resources, is very important. A piece of data is a simple fact whose importance lies in its ability to combine to become information, which, when meaningfully valued, becomes knowledge for decision-making (IAIE, Instituto de Auditores Internos de España, 2019).

Data analytics is the science and art of discovering and analysing patterns, identifying anomalies and extracting other useful information in the underlying data (Byrnes et al., 2015). In other words, *data analytics* enables decision-making by establishing non-obvious relationships between data and transforming them into relevant and useful information for the organisation, information that would not be obtained through traditional data processing methods.

The audit sector is no stranger to this fact, where emerging technologies, most of which have information processing and management in common, have enabled the improvement of processes and, consequently, the evolution of organisations (López de-Sebastián-Miró et al., 2020). In the same vein, García and Navallas (2020) state that the large volumes of existing data have made new data analysis technologies essential in the field of auditing.

But aside from their undeniable benefits, one cannot ignore the fact that their use and implementation entail several associated risks, both economic and technological, as well as human (Islam and Stafford, 2021). As far as technological risks are concerned, it is important to highlight the security of the information involved in the processing and management of data. As noted by Broeders et al. (2017), expectations for *big data* are high but require additional safeguards to guarantee and protect citizens' fundamental rights.

Regarding human risks, the 2030 International Standards for the Professional Practice of Internal Auditing states that internal audit resources should be appropriate, sufficient and effectively allocated to fulfil the department's mission. The figure of the internal auditor requires an integrated and transversal knowledge of all areas of the organisation (De-Lara-Valero et al., 2017). To which must be included the need for training in the field of new technologies, such as *data analytics*, to ensure comprehensive training in the skills and knowledge necessary for the practice of internal auditing (López De-Sebastián-Miró et al., 2020).

As a result, the profile of the internal auditor has come to be considered as one of the best-qualified professionals within organisations (IAIE, Instituto de Auditores Internos de España, 2019), traits that should be taken into account when selecting this kind of profile by human resources departments. However, despite the literature available on the three research terms, internal audit, *data analytics* and human resources, few publications link the terms together, suggesting a lack of awareness of the important relationship these concepts have within organisations and for the future of the auditing profession.

Therefore, the main theoretical contributions of this study consist of covering the existing gap in the literature related to data analytics, human resources and internal audit, as well as exposing the main items to be taken into account when proposing to implement a technology of these characteristics. On the other hand, from a practical perspective, this work aims to provide a guide or model to serve as a reference for internal audit departments wishing to incorporate data analytics tools in their processes.

The present work has three main objectives: (1) To understand the relationship between the internal audit function, data analytics, and the management of the audit team; (2) To propose a theoretical model of methodology for the implementation of *data analytics* in an internal audit department, and (3) To analyse the relationship between the use of new technologies and the improvement of audit processes in terms of effectiveness and efficiency. In order to achieve these objectives, the work is structured as follows. The first section contains a literature review of all the factors that interfere with the audit process, as well as a descriptive analysis of the literature. The following section proposes a model for the implementation of *data analytics* in an internal audit department, along with a framework of best practices in the management of this process. Finally, the conclusions reached will be presented.

2. Methods

The method chosen begins with a review, analysis and discussion of the literature relevant to the study's subject matter. A literature review is an account of what has been published, the purpose of which is to convey to the reader what knowledge and ideas have been established and what their strengths and weaknesses are, for further discussion. To carry out this literature review, the following steps have been considered: (1) Identify sources of information, (2) Identify and analyse the usefulness and relevance of selected publications, and (3) Bring together a number of independently conducted studies, sometimes with opposing results, and synthesise their findings (Rodríguez-Sánchez et al., 2019).

Three objectives are to be achieved through these phases: (1) To measure the evolution over time of publications on the subject studied, (2) To analyse the need to contribute complementary knowledge to the subject studied, and (3) To contribute to the dissemination of the importance, and increasing relevance, of internal audit departments in organisations.

The information-gathering process should avoid selection bias, hence the need to search as many sources as possible, and with appropriate selection criteria (Khan et al., 1996). For this purpose, the bibliographic search was carried out in three databases: *Web of Science* (hereinafter WoS), *Scopus* and the Institute of Internal Auditors of Spain (hereinafter IAIE). The first two have been selected because they are two of the world's leading databases of bibliographic references and periodical citations, while the IAIE has been selected for its specialised nature in the subject matter, the development of the professional practice of internal auditing and, especially in recent years, its contribution to the disruptive potential of technology in the profession.

This analysis will be carried out in two phases. Firstly, the number of publications will be analysed according to previously defined search criteria, and the number of citations of the references obtained will

Abbreviations: IAIE, Instituto de Auditores Internos de España; IIA, Institute of Internal Auditors; FECYT, Fundación Española para la Ciencia y la Tecnología; WoS, Web of Science; SOX, Sarbanes-Oxley; DEA, Director de Auditoría Interna; ERP, Enterprise Resource Planning.

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be analysed (the IAIE database has been excluded from the relevance analysis due to its limitation in identifying its number of citations). Secondly, a study of the evolution of publications over time will be carried out to analyse the growing importance of the subject studied. To achieve the objectives laid out in this paper, a search for publications dated 19/05/2022 was carried out using the following search procedure (Table 1).

It is important to establish a temporal progression in the publication of articles that allows us to analyse the increasing relevance of the study we are preparing to carry out. As can be seen in Figure 1, interest in the research topic is increasing over time, with an above-normal trend from 2020 onwards. This increase can be explained if we look at global economic and cultural developments in that period.

TABLE 1 Search procedure.

Databases	*WoS*	*Scopus*
Scope	Worldwide scientific production	Worldwide scientific production
Characteristics	Quality indicators: JCR, no. of citations, quartiles.	Quality indicators: SJR, no. of citations, quartiles.
Inclusion criteria	*Topic*	*Topic*
Time range	Every year until 2022	Every year until 2022
Search date	May 12, 2022	May 12, 2022
Search terms	"*Internal Audit**"	"*Internal Audit**"
	"*Data Analytics*"	"*Data Analytics*"
Initial results	23	28
Inclusion criteria	Articles	Articles
	Book chapters	Book chapters
	Review	Review
Results	18	23
Filtering by áreas	*"Management"*	"*Business, Management and Accounting*"
	"Business Finance"	*"Economics, Econometrics and Finance*"
Results	12	17
Filtering	Duplicates	Duplicates
	Authors not identified	Authors not identified
	Not related to the *topic*	Not related to the *topic*
Final results	11	15

Own elaboration.

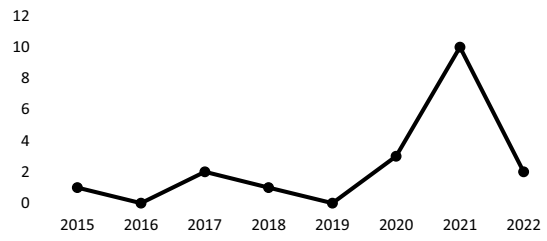

FIGURE 1
Time evolution of publications. Own elaboration)

As discussed above, the SOX Act (2002) can be considered the modern origin of the internal audit function. However, this would not explain the considerable upturn in the publication of articles from 2020 onwards. This is because SOX addresses financial transparency issues but does not link the internal audit function to new information technologies.

A convincing explanation for this can be found in the shift in the profession's approach, an evolution that views emerging technologies as audit tools for the present and the future (López De-Sebastián-Miró et al., 2020).

It is therefore the emergence of new technologies, specifically *data analytics*, that has led to a surge in publications analysing the relationship between these two concepts, internal auditing and *data analytics*. In this regard, it is worth noting that thanks to the expansion and adoption of *data analytics*, many organisations have focused on converting big data and incorporating it into their technology infrastructure (Deloitte, 2016).

3. Analysis model: Success factors in the implementation of data analytics in internal audit departments

Businesses need revenue to survive, just as they need their core business to function in order to be profitable. However, in setting and achieving objectives, we must not forget a concept that, from now on, will become particularly important: risk. The organisation must consider the risk it will take to achieve its goals, namely its risk tolerance, both in its quantitative and qualitative variables (IAIE, Instituto de Auditores Internos de España, 2017). In this regard, Nordal et al. (2017) highlights the impact of organisational culture on the identification and treatment of risks.

This is where the internal audit function, through its assurance, risk management and corporate governance activities (Rivero, 2016), plays a leading role, providing an added value that is both necessary and fundamental for the organisation's survival. The internal audit function, therefore, helps to improve the organisation's control environment, as well as the management and administration of risks following the analysis and evaluation of the different business processes (Arjona-Canas et al., 2017).

However, the importance of the internal audit function as a driver of change and a generator of added value in organisations (Arjona-Canas et al., 2017) has progressed from a traditional approach to a modern one, largely driven by the advent of new data analytics technologies, providing a more effective assurance with a more efficient use of resources. *Data analytics* can thereby improve the performance of the internal audit function (Smidt et al., 2021).

Although it is true that at the beginning of the 20th century the internal audit function had a generally financial perspective (Villegas, 1992), this study aims to analyse its more operational approach. Internal auditing is seen as an independent activity of supervising compliance with rules, policies and procedures through internal control, evaluating its design and effectiveness, and becoming an advisory function for the company and its owners (López et al., 2003).

However, to achieve this improved process through the implementation of *data analytics* technology, a number of factors must be considered that will determine the success of the change (Islam and Stafford, 2021). Similarly, any process re-engineering through technology has to be approached according to certain phases (Hammer and Champy, 1994).

To this end, IAIE, Instituto de Auditores Internos de España (2019) proposes that problem-solving should be approached from six distinct phases: The identification and definition of the problem, the search for and development of alternatives, the evaluation and comparison of alternatives, the selection, the implementation of said selection, and the monitoring and follow-up.

In this study, the incorporation of *data analytics* for the improvement of internal audit processes, it is deemed appropriate to simplify the six phases proposed above into four. The purpose of this simplification is not to eliminate any of the phases suggested by the IAIE, but rather to group some of them as they are indirectly included in the four phases proposed for this study, to simplify and focus the reader's attention. Thus, the phases considered are as follows: (1) Identification of what is needed, (2) Cost–benefit analysis, (3) Decision on technological implementation, and (4) Monitoring and follow-up of results.

3.1. Identification of needs

The International Standards for the Professional Practice of Internal Auditing states in its Standard 2000 (IAIE, Instituto de Auditores Internos de España, 2017, p. 43) that the internal audit activity adds value to the organisation and its stakeholders when it considers its strategies, objectives, and risks, delivers process improvements, and objectively provides assurance.

To provide this assurance, the 2010 Standard (IAIE, Instituto de Auditores Internos de España, 2017, p. 43) indicates that the director of internal audit (hereafter, DEA) should establish a risk-based audit plan consistent with the organisation's goals, with its corporate culture. This indicates that the internal audit function adds value when it provides risk assurance in accordance with the requirements and needs of its stakeholders, both internal and external to the organisation.

Argue for the strong relationship between the strategic level and the other levels of the organisation as a key factor for joint success. Other authors such as Andrade et al. (2021) state that the choice of audit projects must be made meticulously, so that they are aligned with the strategy of the organisation to which they belong.

Therefore, audit processes should be focused on the key risks that threaten the organisation's operational objectives. This is known as a risk-based internal audit (Coetzee and Lubbe, 2013).

While it may seem that auditing processes based on their risk are widely accepted, studies such as the one conducted by Coetzee and Lubbe (2013) show that while private companies enjoy a high level of risk maturity, this is not the case in public sector organisations. Thus, it is clear that the consideration of risk in the organisation has not traditionally been seen as it is today and depends to a large extent on the company's climate and culture.

In this sense, Reichers and Schneider (1990) state that the organisational error climate is part of its culture and comprises beliefs that are considered commonplace concerning error handling in an organisation. As such, in a climate of high error management, it is recognised that errors are likely to occur every time people perform different tasks (Gronewold and Donle, 2011), so managing the organisational climate is seen as a key determinant of the internal audit function.

In addition to the assurance function, an effective internal audit helps the organisation to improve its internal controls. The internal auditor should participate in corporate governance by assessing the internal controls in different areas of the organisation (Singh, 2003), and proposing improvements. This way, the internal audit department contributes to the organisation's governance (Hu et al., 2021) by assessing its internal controls.

Therefore, it can be said that the internal audit function has a dual objective, on the one hand, to provide assurance, and on the other hand to improve governance. Both functions should be considered when drawing up an audit plan based on existing risks within the organisation.

Using the risk factor as the basis on which the internal audit plan is prepared will allow prioritisation of the higher-risk areas of the company over the lower-risk areas. This approach ensures that the risks are within acceptable and tolerable levels for the organisation (Coetzee and Lubbe, 2013).

However, risk-based planning requires prior knowledge of risk. It is important to note that an organisation's risk map does not remain static but is an ever-changing variable over time and therefore needs to be updated with sufficient frequency to always provide a true picture of the organisation's situation.

In this regard, the Institute of Internal Auditors (IIA) establishes in its standards of good practice that the level of risk should be identified and assessed at least once a year (Institute of Internal Auditors (IIA), 2022, standard 2010.A1). Traditionally, these risk measurements have been performed based on results of audits already carried out and historical information. This poses a constraint, since, if the current situation of the company is to be known, it will be calculated based on the results from previous months, and even years.

Silva and Almeida (2014) reinforce this limitation by suggesting that the traditional approach to internal audit project management is based on consulting data, facts and records of past projects, which may be insufficient for the current scenario, marked by greater access to information and technologies.

However, *data analytics* provides an alternative to this limitation. Compared to audit plans based on historical information, *data analytics* offers the possibility of knowing the current risk situation of each of the areas of the organisation at any given moment in time. This applicability of data analytics is supported by studies such as the one carried out by Broeders et al. (2017), who state that, although big data can be used to carry out historical analysis, its true potential lies in its predictive and real-time use, which provides the ability to predict the future with a high degree of probability.

Furthermore, in this process of incorporating technology into the internal audit function, it is essential to have the organisation's support. The perceived need for adopting technology in audit processes will depend on the organisation's perception of its ease of use and usefulness (Kim et al., 2009), as well as the existing conditions that facilitate it (Mahzan and Lymer, 2014).

Furthermore, it is considered relevant to include an additional element to the ease of use and usefulness, the real need to introduce a change in a process that is already being carried out with other simpler and less expensive tools such as Excel. Again, *data analytics* provides an answer to this question by providing an increase in the processes' effectiveness and efficiency (Smidt et al., 2021), which we do not obtain with other tools. In this sense, only those companies that adopt a change in their processes will be able to maintain and increase their competitive level in the future (PwC, PricewaterhouseCoopers, 2012, p. 2).

However, the will to change is of no use if there is not adequate involvement of the company's owners, managers and human resources. In this sense, and as the internal audit is an independent assurance unit (IAIE, Instituto de Auditores Internos de España, 2019), it is essential to

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have the support and direct involvement of the company's management, who must provide sufficient confidence to carry out the necessary changes to adapt to the market's most current and sophisticated technologies. In other words, a change of mentality is needed that considers the internal audit department as a driver of change in the organisation (Arjona-Canas et al., 2017).

Future success will depend on this ability to align the technological interests of the department with the interests of the different stakeholders, since only with a good organisational culture and a desire for technological change can the desired goals be achieved (López De-Sebastián-Miró et al., 2020).

Therefore, it can be deduced from the above that the improvement of audit processes, understood as an increase in their efficiency and effectiveness, as well as real-time knowledge of the organisation's risk, are the main triggers for the process of implementing *data analytics* in an internal audit department.

3.2. Cost–benefit analysis

Once the current needs of the organisation have been satisfactorily defined and analysed, an updated view of the company's risk has been obtained and the department's objectives have been aligned with the corporate objectives, a technological acquisition project will be proposed. For this task, the second phase of the change's implementation will consist of an evaluation of the expected cost–benefit:

Cost–benefit analysis is defined as a systematic approach designed to analyse the strengths and weaknesses of different alternatives, through an investment plan according to the expected benefits to decide which one best meets the organisation's interests (David et al., 2013).

Data analytics brings a number of indisputable benefits, but whether the expected results justify the costs associated with the investment must be analysed (Ngulube, 2011).

Additionally, obtaining the necessary funding for the investment will be more difficult if this prior analysis is not available (Aguilera-Díaz, 2017).

When carrying out a project to implement technology such as data analytics in an internal audit department, a series of factors or facilitators must be taken into account, and the success or failure of the project will depend on their correct management.

Table 2 sets out the main items to be taken into account when carrying out the cost–benefit analysis for the implementation of technological change, differentiating them according to the phases of the standard audit in which they occur.

The project of implementing data analytics in an internal audit department suggests that it be analysed considering the 4 fundamental phases into which a standard audit work is divided, phases established on the basis of the guidelines and recommendations issued by the IAIE: planning, execution, reporting and periodic follow-up (IAIE, Instituto de Auditores Internos de España, 2019).

Before analysing each of the four phases described above in detail, Table 3 considers providing a rough estimate of the time, calculated as a percentage of the total time spent on a standard audit and in each phase. The objective is to establish a starting point for understanding the phases of the process to which more resources and effort (higher risk) should be devoted, as well as to establish the basis for interpreting the project's final result and objective, reducing and transferring costs from one phase to another.

TABLE 2 Cost–benefit analysis of data analytics implementation.

Standard audit phases	Costs	Benefits
Planning	• Software Acquisition • Training • Investment in human factor	• Updated risk status of the audited unit
		• Trend analysis
		• Previous population analysis
		• Sampling optimization
		• Resource allocation optimization
Execution		• Fraud detection
		• Resource optimization / Automation
		• Audit risk reduction.
Reporting		• Visibility
		• Impact
		• Reliability
Follow-up of recommendations		• Continuous Auditing
		• Cost reduction

Own elaboration.

TABLE 3 Estimated percentage of time dedicated to each phase of a standard audit.

Phase	% of time over total audit time
Planning	20%
Execution	65%
Reporting	15%

Adapted from the phases proposed by the Institute of Internal Auditors of Spain, 2019.

In this case, the follow-up phase has not been considered in this estimate as it is not directly related to the audit, but is linked to it as a subsequent and complementary phase.

Computer-assisted auditing techniques will be used by auditors to improve audit efficiency, uncover operational problems, and achieve more effective monitoring (Fan, 2020). Therefore, once the point of origin of a standard audit has been established, the four phases described above are detailed to analyse the possible improvement of processes to conclude what percentage of time can be saved in each of them, time that can be regarded in two different ways: effectiveness and efficiency.

Efficiency: This is understood in two ways. On the one hand, a reduction in audit costs through a reduction in the time spent on operational and routine tasks—Optimisation of the audit—(Rojas-Amado and Escobar-Ávila, 2021). On the other hand, cost transfer: through an analysis of the dedication percentage in each of the phases, a reallocation of resources can be carried out, so that we manage to increase the overall efficiency of the audit by dedicating the greatest volume of resources to the phases that require it most.

Effectiveness: using data analytics allows for the analysis of the total population and of information that could hardly be carried out using manual techniques (IAIE, Instituto de Auditores Internos de España, 2019; Oliván-Mainar and Fernández-Vicente, 2021).

3.2.1. Phase 1: Planning phase

In today's business context, where all organisations generate large volumes of data continuously, it is particularly relevant to have a tool for processing this data (Islam and Stafford, 2021). Traditionally, this task

has been carried out manually and tediously. However, with today's tools, this work of acquiring and processing data to obtain useful knowledge becomes much more affordable, effective and efficient.

Due to the globalisation and digitalisation of companies, risks are changing faster and faster due to the dynamic risk environment, so a flexible audit plan is needed to cover the uncertainty and complexity in companies (Eulerich et al., 2020).

Planning occurs before conducting fieldwork or audit testing, the risk assurance. In this stage, the objectives and scope are established. It begins with the definition of the scope and ends just before the execution of the tests. For the purpose of this study, audit planning will be considered in the two aspects in which *data analytics* technology can be incorporated: preparation of the overall audit plan, and planning of specific audit tasks. In other words, planning aims to objective is to create an audit plan that is carried out effectively [Normas Internacionales de Auditoría, (NIAs). n.d., 300.4].

In this phase, the expected benefits relate to the information hidden within the data; the aim being to uncover non-obvious relationships between said data, pearls of information that usually go unnoticed (IAIE, Instituto de Auditores Internos de España, 2019).

In the definition phase of the annual audit plan, as well as the planning of specific tasks, studies such as "elevating internal audit" carried out by PMP (2021), suggest that the main benefit of *data analytics* will be to use this hidden information to guide the allocation of resources or, in other words, to use this technology to understand the company's situation, identify trends and carry out population analyses that allow us to better focus the audit work based on the risk they present. As such, investments in technology have been shown to improve the breadth and depth of audit coverage (Protiviti, 2021).

As an example, if a model audit of the procure-to-pay process is analysed, the use of *data analytics* will allow to know, prior to any testing, the status of all transactions that have taken place in a given period of time. From this prior knowledge, information on the weaknesses and strengths of the departments involved in the process will be extracted in order to plan the audit based on the actual situation at a given point in time. The aim is therefore to focus attention and efforts on those phases of the procure-to-pay process that require it most.

This finding is also shared by West et al. (2005), who stated that even a fraction of an improvement in prediction quality can result in financial savings (Hu et al., 2021).

3.2.2. Phase 2: Execution phase

Audit testing is the process by which risk assurance work is carried out (IAIE, Instituto de Auditores Internos de España, 2019). All units or departments of an organisation carry out a series of activities that are associated with risks inherent to the process. Thus, in order to control or reduce such risks to a tolerable level, a series of controls are established to mitigate these risks. The execution phase consists of testing that these controls are working correctly, thus reducing the risk to a residual and manageable level for the organisation (IAIE, Instituto de Auditores Internos de España, 2019).

The audit team will perform tests, collect evidence, analyse data and information, and draw conclusions and recommendations. The IAIE, in its Manual "Internal Audit Practice" (2019), states that the execution of audit tests can be considered one of the critical phases of the audit process, as it is at this stage that evidence is gathered, data is evaluated, and observations and recommendations are made, all of which require a large number of resources. This makes it the key phase for the implementation of *data analytics* technologies (Rojas-Amado and Escobar-Ávila, 2021).

The key benefit of *data analytics* in this phase will be its ability to automate testing. This will reduce the time spent on testing. Furthermore, the analysis of non-obvious relationships between data provides other benefits that would not be achieved by manual analysis, such as fraud detection and reduced audit risk (Schneider and Dai, 2015). The latter position is reinforced by studies such as the one conducted by Islam and Stafford (2021), who identified that in highly regulated industries, where one of the audit objectives is fraud detection, the likelihood of data analytics adoption increases by 8.5%. It is also important to note that the study focused on the adoption of *data analytics* in five key areas of the company: population testing, process improvement, compliance, risk control and fraud management. As can be seen, these areas overlap with those mentioned in this study.

However, the use of massive information at this stage is not without risk. Too much information can confuse users, as well as lead to biased judgements (Hu et al., 2021). To address this issue, *data analytics* aims to help users identify and analyse information more quickly and provide more reliable results (Hu et al., 2021).

Moreover, with regard to the reduction of audit risk, it is worth mentioning that the use of advanced audit tools allows for a population-based analysis of all transactions, replacing the sample-based study that has been carried out until now. Authors such as Feung and Thiruchelvam (2020) point out that *data analytics* represents a paradigm shift from a traditional risk-based sampling and auditing approach to a whole population verification approach.

The importance of replacing the sample analysis becomes evident if we take into account that a non-conformity, or deficiency not detected in a sample selected by the auditor, could extend its effects, causing inaccuracies in the rest of the processes (Andrade et al., 2021).

Therefore, the benefits of the execution phase can be synthesised in the reduction of audit risk (greater effectiveness), as well as the automation of tests and reduction of time spent (greater efficiency; Oliván-Mainar and Fernández-Vicente, 2021).

3.2.3. Phase 3: Reporting of results

One of the fundamental reasons for the existence of the internal audit function is the concern of stakeholders for the proper functioning of the organisation. In this sense, authors such as López De-Sebastián-Miró et al. (2020) point out the importance of providing the Audit Committee and senior management with relevant information for decision-making.

The reporting phase consists of communicating audit results to stakeholders (IAIE, Instituto de Auditores Internos de España, 2019). This communication is as important as the execution work, as poorly worded or poorly reported results detract from the added value of the work performed. The audit report is also critical because it acts as a catalyst for change (IAIE, Instituto de Auditores Internos de España, 2019). This highlights the exciting possibilities of *data analytics* in this phase, as it offers greater visibility and impact in the communication of audit findings.

On the other hand, in multinational companies, where the internal audit function is centralised in a single location (usually the Group's parent company), having a tool for the continuous exchange and analysis of information becomes a huge advantage, as it allows us to know the real situation of any of the subsidiaries at any given time without the need to carry out a complete audit.

The primary objective pursued with *data analytics* in this phase is, therefore, to report the identified audit findings in a more visual and useful way.

3.2.4. Phase 4: Follow-up phase

In addition to the previous phases, it is necessary to include an additional one due to the importance that is drawn from it, the follow-up of recommendations (IAIE, Instituto de Auditores Internos de España, 2019).

The IAIE, Instituto de Auditores Internos de España (2019) states that the follow up of recommendations consists of providing assurance to stakeholders that deficiencies identified during audits have been corrected or, while not 100% corrected, have mitigated the risk to a level that is acceptable to the organisation.

The application of *data analytics* in this process will consist of using the automated testing spectrum, scheduling it over time thanks to applications embedded in the analytics tool, and automating the entire follow-up process, from testing to the reporting of findings. In this sense, Andrade et al. (2021) point to *data analytics* as the leading tool used to carry out a continuous audit of processes.

Finally, it is essential to highlight an element common to all the proposed phases. Thus, studies have shown that the use of *data analytics* in auditing represented a 44% reduction in time spent in the execution of audits compared to the same scenario prior to the implementation of the tool. Considering the number of tests performed, there was an increase of 80%, not to mention the increase in the sample size, which now considers 100% of the population of the audited period (Andrade et al., 2021).

3.3. Technology implementation decision

Once the two previous phases (identification of needs and cost–benefit analysis) have been successful, the decision to implement *data analytics* in the internal audit department will be made. However, despite the success of the two previous phases, the project's success factors must be considered. Thus, Table 4 sets out the main factors to be taken into account before making the final implementation decision.

TABLE 4 Factors to consider in the successful implementation of data analytics.

Standard audit phases	Factors
Planning	• Technological situation of the organisation
	• Degree of digitalization
	• Innovative culture / Willingness to change
	• Existence of adequate and sufficient resources
Execution	• Staff qualification / Trainning
	• Flexibility
	• Medium and long term mentality
	• Resistance to change
Reporting	• Awareness of the management layer
	• Resistance to change
	• Medium and long term mentality
Follow-up of recommendations	• Medium and long term mentality
	• Collective involvement of other areas

Adapted from the phases proposed by the Institute of Internal Auditors of Spain, 2019.

3.4. Monitoring and follow-up of results

"No problem-solving process is complete until the impact of the selected alternative has been monitored and evaluated and, if the problem that motivated the change still exists, the resolution cycle will need to be started again" (IAIE, Instituto de Auditores Internos de España, 2019).

Thus, based on the definition provided, monitoring and follow-up is the quantitative and qualitative evaluation of the decision taken, comparing expectations and results, and analysing whether the technological change incorporated has been satisfactory.

In addition to the factors detailed in each of the previous phases, other facilitators must be considered when preparing to carry out a project of these characteristics. Because of their global scope, they are not unique to the internal audit department but affect the organisation as a whole. These factors or enablers are as follows:

3.4.1. Degree of digitalisation

The degree of digitisation in the company is a prerequisite for carrying out this type of project. *Data analytics* tools aim to access data, process it, and draw conclusions. The ability to identify and evaluate unstructured data will lead to better audit evidence and facilitate the effectiveness of internal control (Schneider and Dai, 2015). Data processing or data mining is the process by which data are grouped and classified according to their characteristics (Yang et al., 2022).

However, this integration process of *data analytics* would not be possible without adequate access to data, i.e., without the data being organised and digitised in the organisation's IT systems. Digitalisation is the process of introducing digital technologies, which essentially deal with changes caused by information technologies (Nathanael and Sarens, 2021).

Therefore, the inclusion of advanced auditing technologies is most prevalent in large organisations with advanced information management systems, such as Enterprise Resource Planning (ERP) systems, where information, data, and access to data is stored and made easily accessible.

However, the availability of information in complex integrated systems cannot be without risks. The link between the company's information system and business strategy has a certain effect on the achievement of the organisation's goals (Hu et al., 2021). Authors such as Morales et al. (2022) point out that in a context in which the internal auditor is dependent on the information contained in a computer system, it is essential to carry out an analysis of the integrity of the information contained therein to guarantee its reliability.

In conclusion, the larger the organisation, the greater the need for advanced information management and administration systems.

3.4.2. The human factor

The human factor is the other major enabler that will be considered indispensable to our study. As with digitalisation, this factor is common to all phases of the audit process. In turn, the human factor analysis will include the degree of involvement, training, and the level of acceptance and management of change.

In recent years, the internal auditor profile has become one of the best-qualified professionals within the organisation (IAIE, Instituto de Auditores Internos de España, 2019). When using *data analytics*, the auditors' IT skills are key to driving its adoption (Krieger et al., 2021). This new IT competence, far removed from the more traditional financial profile (Villegas, 1992), poses an added difficulty in the search for internal auditor profiles. Therefore, to achieve process improvement based on *data analytics*, IT knowledge and critical thinking skills are indispensable (Islam and Stafford, 2021).

In this sense, it is evident that it is difficult to adapt to technological change when it is observed that Microsoft Excel is still the software tool most used by internal audit departments (Smidt et al., 2021).

However, to overcome this training obstacle, a multitude of data analysis tools have now been developed that incorporate a relatively simple user-machine interaction interface, so that anyone, once trained in the use of the tool, can programme execution scripts without the need for extensive programming knowledge.

Lastly, an in-depth examination of change management and the audit team's resistance to change is considered relevant. Authors such as point to the importance of the acceptance of change by the audit team as part of the success of the change process. In this regard, other authors such as Dai (2017) add the importance of there being an organisational culture of support for change from the executive layer of the organisation.

Introducing a new technology entails an extra effort on behalf of all stakeholders (training, investment in time, etc.). However, within this human resources management, special attention must be paid to how change is managed within the department, where overcoming barriers such as resistance to change or attachment to traditional operations can jeopardise the viability of this form of innovation project.

During the integration process, efforts should be made to reduce the complexity of the transition by clarifying the status and roles of each person, thereby simplifying the process (Rodríguez-Sánchez et al., 2017).

4. Discussion and conclusion

In the last century, there has been a series of financial scandals involving large corporations which, in many cases, have cast doubt on the good practices carried out by such organisations. This type of malpractice has a direct impact not only on the companies themselves but also on society as a whole, whose interests are often linked to their good practices.

In this task of protecting the interests of all parties involved, the figure of the internal auditor plays a fundamental role. The role of the internal auditor, as a means of guaranteeing the transparency and good practice of companies, becomes the main mechanism for defending the organisation's interests, ensuring its continued existence, and limiting the intentional malpractice exercised by a minority of people concerned only with their own personal interests.

In this risk assurance and control function, internal audit departments must be aware that strengthening control through technology can reduce, and even eliminate, the impact of human error.

In carrying out this task of improving organisational control, *data analytics* can provide an extraordinary advantage. Through this type of tool, not only is progress made in detecting fraud but it also allows audit processes to evolve, increasing their effectiveness and efficiency. Wang and Cuthbertson (2015) note that *data analytics* allows auditors to perform predictive analytics to examine and identify patterns in data that do not conform to expected patterns. Similarly, this type of tool has allowed for the automation of tests and the identification of risks almost in real time. It has led to a change in the paradigm of a profession that is increasingly oriented towards a continuous auditing model, as opposed to the traditional conception of static auditing.

Therefore, the use of data analytics as an audit tool makes it possible both to reduce work times and restructure the time invested in each of the audit phases (efficiency), such as extending the audits' scope, extrapolating the reviews to the entire population as opposed to traditional sampling (effectiveness).

In this way, and in response to one of the three objectives of this study set out in the introduction, it is concluded that the use of auditing techniques using new information technologies increases the effectiveness and efficiency of auditing processes.

However, apart from the undoubted benefits that *data analytics* offers, there are certain risks when implementing this technology. Risks such as information security, resistance to change, the associated cost versus the expected benefit, or the handling of enormous amounts of information, have led to the need to establish an implementation model that combines technology and people, which serves as a reference framework when attempting to carry out a project of these characteristics.

The results of our study suggest that such a project cannot be undertaken without considering a number of factors associated with each stage of the auditing process. Apart from the expected costs and benefits, the degree of a company's digitalisation, as well as the human factor, are key elements whose correct management will determine the success or failure of the innovation project.

In this regard, it is important to stress that this technology is not intended to supplant the role of the auditor, but rather to complement and, above all, improve it. As the great technological changes throughout history have shown, evolution does not destroy jobs, but rather transforms and reinvents them in a way that results in progress in its more traditional approach. Thus, it can be argued that the internal auditor's role is enhanced by *data analytics*, while data analytics builds on the auditor's knowledge.

This combination of human and technological factors responds to another of the objectives set out in our study. The conception that a project of these characteristics implies a change in the mentality of the auditors, and the fact of considering human resources management as a key factor will mark the success or failure of the project.

Finally, the use of technology as a process improvement tool is not new to the business sector. *Data analytics* tools are already in use today. However, their use is not yet widespread in internal audit departments and there is a great lack of knowledge of both the benefits that can be obtained and how to incorporate technology into their internal processes. Through this research, an implementation guide or model has been developed that allows companies to have a reference on how to carry out a project of these characteristics. Therefore, with the definition of this implementation model, the third of the objectives set out in this work has been achieved.

In short, this new scenario, which is much more technological than the previous one, requires internal audit departments as a whole to bring together new skills and tools that allow for proper risk control in the organisation, an anticipation of future events, and a continuous updating to current trends. In other words, internal audit departments need *data analytics* technology to improve their processes.

4.1. Limitations of the study

The results of this research should be interpreted with caution due to the inherent limitations of the methodological process. While there is a wealth of literature relating to data analytics, internal audit and human resources individually, the same cannot be said about the literature relating the 3 concepts as a whole. These research gaps are a limitation as there are not many references available to address the topic under study.

In addition, another limitation of the study is the difficulty of proposing a practical model based on theoretical concepts. Therefore, further research is needed in this respect in future lines of work.

4.2. Future lines of research

In line with the above limitations, further research is considered necessary in two main areas. On the one hand, more work is needed on improving traditional internal audit processes through new information technologies, specifically data analytics. On the other hand, the theoretical nature of the proposed model represents a great opportunity to be verified through its application in a real case study.

Both lines of research would complement the current literature and provide greater knowledge to a sector in growing development such as internal auditing.

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 authors.

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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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References

Aguilera-Díaz, A. (2017). Cost-benefits as a decision tool for the Investment in Scientific Activities. *Cofin* 11, 322–343.

Andrade, A., Penha, R., and da Silva, L. F. (2021). Use of data analytics tools for increased efficiency in the internal audit project portfolio. *RISUS* 12, 138–149. doi: 10.23925/2179-3565.2021v12i3p138-149

Arjona-Canas, A., Yubero-Hermosa, M. P., Manzaneque-Lizano, M., and Banegas-Ochovo, R. (2017). *Gobierno corporativo, control de riesgos y auditoría interna*. El cambio y valor de las empresas del siglo XXI. Tirant lo Blanch.

Broeders, D., and Schrijvers, E.four other authors (2017). Big data and security policies: towards a framework for regulating the phases of analytics and use of big data. *Comput. Law Secur. Rev.* 33, 309–323. doi: 10.1016/j.clsr.2017.03.002

Byrnes, P. E., Criste, T., Stewart, T., and Vasarhelyi, M. (2015). *Reimagining auditing in a wired world*. AICPA, New York.

Coetzee, P., and Lubbe, D. (2013). The use of risk management principles in planning an internal audit engagement. *South. Afr. Bus. Rev.* 17, 113–139.

Dai, J. (2017). Three essays on audit technology: Audit 4.0, Blockchain, and audit app. Doctoral Thesis. Rutgers University, Newark NJ.

David, R., Ngulube, P., and Dube, A. (2013). A cost-benefit analysis of document management strategies used at a financial institution in Zimbabwe: a case study. *J. Inf. Manag.* 15:540. doi: 10.4102/sajim.v15i2.540SA

De-Lara-Valero, A., and Alcina-Jaume, J. L.13 other authors. (2017). *Gestión estratégica del talento en Auditoría Interna*. Instituto de Auditores Internos de España.

Deloitte. (2016). Analytics Trends, the next evolution. Available at: https://www2.deloitte.com/us/en/pages/deloitte-analytics/articles/analytics-trends.html

Drumea, C. (2008). Rules on business ethics. *Sox standard, Amfiteatru Economic* 10, 155–160.

Eulerich, M., Georgi, C., and Schmidt, A. (2020). Continuous auditing and risk-based audit planning-an empirical analysis. *J. Emerging Technol. Account.* 17, 141–155. doi: 10.2308/JETA-2020-004

Fan, C. L. (2020). Application of the ANP and fuzzy set to develop a construction quality index: a case study of Taiwan construction inspection. *J. Intell. Fuzzy Syst.* 38, 3011–3026. doi: 10.3233/JIFS-190608

Fernández, A. (2007). *La Loi Sarbanes Oxley SOX*. Piloter org. Available at: www.piloter.org/gouvernance-entreprise/sarbanes-oxley.htm

Feung, J. L. C., and Thiruchelvam, I. V. (2020). A framework model for continuous auditing in financial statement audits using big data analytics. *Int. J. Sci. Technol. Res.* 9, 3416–3434.

García, N., and Navallas, B. (2020). Auditoría y Data Analytics. Valoración de los profesionales en España. *AECA: Revista de la Asociación Española de Contabilidad y Administración de Empresas* 130, 15–18.

Goodwin-Stewart, J., and Kent, P. (2006). The relation between external audit fees, audit commitee characteristics and internal audit. *Account. Finance* 46, 387–404. doi: 10.1111/j.1467-629X.2006.00174.x

Gramling, A. A., Maletta, M. J., Schneider, A., and Church, B. K. (2004). The role of the internal audit function in corporate governance: a synthesis of the extant internal auditing literature and directions for future research. *J. Account. Lit.* 23, 194–244.

Gronewold, U., and Donle, M. (2011). Organizational error climate and auditors' predispositions toward handling errors. *Behav. Res. Account.* 23, 69–92. doi: 10.2308/bria-10061

Hammer, M., and Champy, J. (1994). *Reengineering the corporation: A Manifiesto for business revolution*, Harper Collins Publishers, Inc, New York, USA.

Hu, K. H., Hsu, M. F., Chen, F. H., and Liu, M. Z. (2021). Identifying the key factors of subsidiary supervision and management using an innovative hybrid architecture in a big data environment. *Financial Innov.* 7, 1–27. doi: 10.1186/s40854-020-00219-9

IAIE, Instituto de Auditores Internos de España. (2017). *Marco Internacional para la Práctica Profesional de la Auditoría Interna*. Madrid, España: Instituto de Auditores Internos de España.

IAIE, Instituto de Auditores Internos de España. (2019). *Manual para la preparación del examen Certified Internal Auditor* Vol. *1*, 3, Madrid, España: Instituto de Auditores Internos de España.

Institute of Internal Auditors (IIA). (2022). Integrated approaches to internal auditing. Available at: https://www.theiia.org/en/content/guidance/recommended/supplemental/practice-guides/practice-guide-integrated-approaches-to-internal-auditing/

Islam, S., and Stafford, T. (2021). Factors associated with the adoption of data analytics by internal audit function. *Manag. Audit. J.* 37, 193–223. doi: 10.1108/MAJ.04-2021-3090

Khan, K. S., Daya, S., and Jadad, A. R. (1996). The importance of quality of primary studies in producing unbiased systematic reviews. *Arch. Intern. Med.* 156, 661–666. doi: 10.1001/archinte.1996.00440060089011

Kim, H. J., Mannino, M., and Nieschwietz, R. J. (2009). Information technology acceptance in the internal audit profession: impact of technology features and complexity. *Int. J. Account. Inf. Syst.* 10, 214–228. doi: 10.1016/j.accinf.2009.09.001

Krieger, F., Drews, P., and Velte, P. (2021). Explaining the (non-) Adoptation of advanced data analytics in auditing. A process theory. *Int. J. Account. Inf. Syst.* 41:100511. doi: 10.1016/j.accinf.2021.100511

López De-Sebastián-Miró, E., Armendáriz-Vergarajaúregui, J., et al. (2020). *Auditoría Interna del proceso de inversión en tecnologías emergentes*. Instituto de Auditores Internos de España.

López, M. R., Orta, M., Pérez, J., and Pérez, A. V. (2003). *La auditoría interna en España: Una aproximación conceptual*. España, Actas de las XIII jornadas Hispano-Lusas, Universidad de Santiago de Compostela.

Mahzan, N., and Lymer, A. (2014). Adoption of computer assisted audit tolos and techniques (CAATTs) by internal auditors: current issues in the UK. *Manag. Audit. J.* 29, 327–349. doi: 10.1108/MAJ-05-2013-0877

Morales, H. R., Porporato, M., and Epelbaum, N. (2022). Benford's law for integrity tests of high-volume databases: a case study of internal audit in a state-owned enterprise. *J. Econ., Finance and Admin. Sci.* 27, 154–174. doi: 10.1108/JEFAS-07-2021-0113

Nathanael, J. B., and Sarens, G. (2021). Understanding the internal audit function in a digitalised business environment. *J. Account. Organ. Chang.* 17, 197–216. doi: 10.1108/JAOC-11-2019-0114

Ngulube, P. (2011). Cost analysis and the effective management of records throughout their life cycle. *South Africa Archives J.* 44, 1–21.

Nordal, A. B., Stevens, M. W., Kjørstad, O. M., and Kapstad, P. (2017). Guidelines for the risk management function. *IIA Norge*. 11.

Normas Internacionales de Auditoría, (NIAs). Spanish Institute of Chartered Accountants (ICJCE). Available in: https://www.icjce.es/auditoria-214

Oliván-Mainar, C., and Fernández-Vicente, E. J. (2021). *La aplicación del Big Data y el Data Analytics en auditoria*. Universidad de Álcala.

Panagiotis, M., Alexandros, S., and George, P. (2014). Organizational culture and motivation in the public sector. *The case of the city of Zografou, Procedia Economics and Finance* 14, 415–424. doi: 10.1016/S2212-5671(14)00730-8

PMP. (2021). Reporte sobre elevating internal audit. Available at: https://www.diligent.com/insights/audit-reporting/elevate-internal-audit/

Protiviti. (2021). Report about "adopting analytics in auditing". Available at: https://www.protiviti.com/US-en/insights/analytics-auditing-game-changer

PwC, PricewaterhouseCoopers. (2012). Reporte sobre Auditoría interna 2012: un estudio que examina el futuro de la auditoría interna y el posible declive de un enfoque centrado en los controles. Available at: https://www.pwc.com/images/gx/eng/about/svcs/grms/PwC

Rathi, N. A., and Betala, A. S. (2019). How marketing decisions are taken with the help of big data. Data management, analytics and innovation: Proceedings of *ICDMAI 2018*, volume 2, doi: 10.1007/978-981-13-1274-8_8, Advances in intelligent systems and computing, 839.

Reichers, A. E., and Schneider, B. (1990). "Climate and culture: an evolution of constructs" in *Organizational climate and culture*. ed. B. Schneider (San Francisco, CA: Jossey-Bass), 5–39.

Rivero, P. (2016). Factores decisivos para la sostenibilidad de la empresa: Organización, innovación y flexibilidad. *Revista de la Asociación Española de Contabilidad y Administración de Empresas (AECA)*, 115, 52–53.

Rodríguez-Sánchez, J. L., Ortiz-de-Urbina-Criado, M., and Mora-Valentín, E. M. (2017). *La importancia de los recursos humanos en el éxito de los procesos de fusión y adquisición*. Tesis doctoral Universidad Rey Juan Carlos, España.

Rodríguez-Sánchez, J. L., Ortiz-de-Urbina-Criado, M., and Mora-Valentín, E. (2019). La importancia de los recursos humanos en el éxito de los procesos de fusión y adquisición. [Doctoral Thesis]. Madrid, España: Universidad Rey Juan Carlos.

Rojas-Amado, J. C., and Escobar-Ávila, M. E. E. (2021). Benefits of using digital Technologies in External Auditing: a literature review. *Revista Facultad de Ciencias Económicas: Investigación y Reflexión* 29, 45–65. doi: 10.18359/rfce.5170

Schneider, G. P., and Dai, J. (2015). And otros tres autores, infer, predict, and assure: accounting opportunities in data analytics. *Account. Horiz.* 29, 719–742. doi: 10.2308/acch-51140

Silva, W. L., and Almeida, J. (2014). Continuous data auditing as an automation tool for business control. *J. Inf. Syst. Technol. Manag.* 11, 437–460. doi: 10.4301/252FS1807-17752014000200012

Singh, D. (2003). Enforcement decisions in banking regulation and supervision. *J. Int. Bank. Regul.* 4, 301–319. doi: 10.1057/palgrave.jbr.2340148

Smidt, L., and Van der Nest, D. P.three other authors (2021). An assessment of the purpose of the use of generalised audit software: a perspective of internal audit functions in Australia. *Int. J. Information Systems in the Service Sector (IJISSS)* 13, 1–6. doi: 10.23919/CISTI.2019.8760882

Villegas, C. G. (1992) in *Control interno y auditoría de bancos y entidades financieras*. ed. Macchi (Buenos Aires, Argentina: Macchi).

Wang, T., and Cuthbertson, R. (2015). Eight Issues on Audit Data Analytics We Would Like Researched. *J. Inf. Syst.* 29, 155–162.doi: 10.2308/isys-50955

West, D., Dellana, S., and Qian, J. (2005). Neural network ensemble strategies for financial decision applications. *Comput. Oper. Res.* 32, 2543–2559. doi: 10.1016/j.cor.2004.03.017

Yang, J., and Xiu, P. S.three other authors (2022). Social media data analytics for business decision making system to competitive analysis. *Inf. Process. Manag.* 59:102751. doi: 10.1016/j.ipm.2021.102751

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Factors that favor or hinder the acquisition of a digital culture in large organizations in Chile

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Organizational culture is often perceived as a valuable strategic asset supporting business transformation and the exploitation of digital technologies. Still, it can also be the source of inertia that impedes change. The research question proposed is What factors favor or hinder the acquisition of digital culture in large organizations in Chile? The aim is to rank factors that promote a digital culture based on the perception of executives using the Delphi method. The expert panel was selected with strategic criteria, considering practical knowledge, up-to-date experience on the subject, and having high decision-making positions in large companies in Chile. The main statistics used are media, maximum, minimum, and average range, along with the search for consensus determined by the interquartile range and Kendall's W concordance coefficient. Results show a high level of agreement on the importance of digital strategy and digital leadership factors when favoring a digital culture in large companies in Chile. However, large companies in Chile must pay attention to the conservative triad of elements that characterize Chilean work culture that considers the belief that changes are exclusively possible when commanded by the strategic apex, a hierarchical work culture that prevents collaborative work, and the rejection of disruptive change. These factors and cultural characteristics will likely hinder any attempt to succeed in a digital transformation plan.

KEYWORDS

digital transformation, digital culture, digital leadership, digital strategy, Delphi method

1. Introduction

The rapid advancement of digital technologies in nearly all industries has changed the business environment, competitive dynamics, and customer demand (Lucas and Goh, 2009; Morakanyane et al., 2017; Westerman et al., 2019). While new technologies pressure digitalization even in areas that do not depend on them, digital technologies also present new opportunities for business growth. However, integrating and exploiting the opportunities that originate from digital technologies remains a significant challenge for companies. In order to maximize their benefits, the implementation of IT must be supported by an organizational transformation. Companies need to transform and digitalize all their business models and the existing organizational conditions, such as structures, processes, and culture (Clarke, 2014; Morakanyane et al., 2017). Leaders must recognize digital transformation as a strategic and fundamental paradigm shift that requires instilling a culture that supports change while enabling the overall company strategy (Hemerling et al., 2018).

Organizational culture is often perceived as a valuable strategic asset that has the potential to support business transformation and the exploitation of digital technologies (Westerman

et al., 2019). Organizational culture can also be the source of inertia that impedes change (Lucas and Goh, 2009; Rodríguez, 2011). In research and practice, cultural change is perceived as essential for successful digital transformation in companies, especially when dealing with disruptive transformations brought about by new technologies (Westerman et al., 2019).

Digital culture in an organization is defined as a set of behaviors and habits to make the most of the potential of new technologies, aiming to transform the business model or organizational models to create value for customers, employees, and shareholders (Ochoa, 2016; Trushkina et al., 2020). Developing a digital culture is one of the critical pillars of digital transformation in companies. Those who implement it have a strong propensity to encourage risk-taking and innovation and develop collaborative work environments (Kane et al., 2017).

However, despite the perceived need for cultural change, most research only briefly addresses culture as a research topic. While unique values and generalized cultural attributes are sporadically proposed to foster successful digital transformation, there has not been a comprehensive analysis of which cultural values are crucial to the success of digital transformation. For this reason, this study intends to complement the wide range of factors and indicators associated with digital transformation in organizations that, despite having different approaches, may contain variables and dimensions in common.

The research question proposed is What factors favor or hinder the acquisition of digital culture in large organizations in Chile? The aim is to rank factors that promote a digital culture based on the perceptions of senior executives using the Delphi method. The Delphi method is one of the most used methodologies in scientific research today for problematic situations (Almenara and Moro, 2014), searching for consensus through the knowledge of a group of experts directly related to the objective, and topic of study (Aengenheyster et al., 2017). Results show a high level of agreement on the importance of digital strategy and digital leadership factors when favoring a digital culture in large companies in Chile. However, large companies in Chile must pay attention to the conservative triad of elements that characterize Chilean work culture, that considers the belief that changes are exclusively possible when commanded by the strategic apex, a hierarchical work culture that prevents collaborative work, and the rejection of disruptive change. These factors and cultural characteristics will likely hinder any attempt to succeed in a digital transformation plan.

2. Theory

This research proposes to investigate the concepts associated with digital transformation in organizations, understanding that they have a profound effect on society. These changes are understood from the theory of social systems in the context of an organizational society (Rodríguez, 2011). Thanks to industrialization, organizations are taking care of all the needs of society, reaching unprecedented diffusion, such as those that, through digital applications, solve the need to connect people to find companionship, thus transforming the social rules of seduction (Lipovetsky, 2020). Organizational systems, structurally coupled with their environment (Maturana and Varela, 1984) are affected by changes in society, while society is affected by the industrialization process and the effects generated by organizational systems. This co-evolution sustains constant increases in complexity in today's society thanks to evolutionary acquisitions, which allows us to understand how "technique" generates profound effects on society and civilization (Luhmann, 2007).

The changes brought about by the digital economy are having a strong impact on organizations and the sciences that study them. Digital transformation is understood as the adoption of disruptive technologies to increase productivity, value creation and social well-being (Ebert and Henrique, 2018). It is also defined as the process used to restructure economies, institutions, and society at the system level through the incorporation of digital technology, triggering significant changes in their properties by strategically responding to their environment and optimizing their value creation processes (Galliers, and Jarvenpaa, 2010; Rachinger et al., 2018). In other words, with digitization information is digitized, with digitization the processes and roles that make up business operations are digitized, and with digital transformation the organization and its strategy are digitally transformed, affecting its culture.

Literature has shown great fertility when it comes to defining organizational culture, like a system of shared beliefs, norms and values, whether declared or practiced, that attribute meaning and an interpretative framework to the processes, behaviors and events that occur within an organization and that lead to the formulation of policies (Geertz, 1973). This system of shared values and beliefs interacts with the organizational structure, its members, and the control systems, producing norms of behavior (Harrison, 1972). It can also be described as a set of meanings and values that, as building blocks, configure the culture and are expressed through symbols, behaviors, and organizational structures (Garibaldi et al., 2009), allowing them to interpret such actions and judge them as appropriate or inappropriate. The evolution of a certain culture is attributed to an organizational learning process whether facing external or internal problems (Schein, 1990). The basis of these "institutional thoughts" is given by the culture that each organization has built (Douglas, 1996).

Schein's (1990) may be the most influential definition and although important, does not consider that negative presumptions and beliefs are also part of the culture, and therefore have never served to adequately face subsistence problems or integration problems. Despite having a dysfunctional character, these cultural elements persist and can be used as guides for action (Rodríguez, 2011). Regarding these multiple interpretations of the concept of organizational culture, probably all the authors would agree in pointing out that they correspond to particular ways in which things are done within an organization. Therefore, organizational culture allows the reduction of complexity, by establishing a restricted framework of expectations (both individual and institutional) and possibilities of behavior, based on a general pattern of decision-making (Luhmann, 2010).

Digitization is the implementation and exploitation of digital opportunities using digital technologies. In the business context, this is associated with influencing the way processes are performed, changing business models, generating new revenue, and transforming how customers and businesses engage and interact (Bloomberg, 2018; Jovanović et al., 2018; Rachinger et al., 2018). This process of organizational transformation offers great competitiveness potential but requires adopting new operating patterns and innovative culture

(Mirković et al., 2019). Thus, more technological companies have more significant profits and better-satisfied customers (Weill and Woerner, 2018).

The majority of existing models that analyze the digitization process in companies provide an incomplete picture of digital maturity, and the attributes that reflect a digital culture are not systematically integrated (Chanias and Hess, 2016; Remane et al., 2017; Teichert, 2019). However, many existing studies look at digital transformation using different indicators, therefore measuring various aspects of the phenomenon. For example, while some authors consider that a slight change enabled by technology (such as the implementation of a new ERP system) is an expression of digital transformation, others believe that this is a more radical and evolutionary process that takes place over time (Janowski, 2015; Loebbecke and Picot, 2015; Wang, 2016). Likewise, while some researchers associate digital transformation with business models and strategies, others see it as a paradigm or a process that must complete a series of stages (Berman, 2012; Berman and Marshall, 2014).

Digital transformation is a different concept. It is defined as the company's ability to react and successfully use new digital technologies and procedures to drive significant change in its performance and business model (Cortellazzo et al., 2019). It represents applying digital capabilities to processes, products, and assets to improve efficiency, increase customer value, manage risk, and discover new monetization opportunities (Morakanyane et al., 2017). Similarly, Bertini (2016) points out that digital transformation affects individuals' everyday experiences.

Digital transformation must be understood as a significant organizational change where innovation plays the primary role, affecting employees' creative capacity (Villaplana and Stein, 2019). Therefore, it is effective when companies invest in developing digital skills and capabilities aligned with their corporate strategy. It must occur coordinately in all organizational dimensions: strategy, people and culture, structure and management systems, business processes, and technology (Ochoa, 2016). Consequently, digital maturity is a concept that reflects the adaptability of the organization to compete effectively in an increasingly digital environment. Therefore, it is a continuous process of adaptation to a digitally changing context, and as such, an organization must assess its digital maturity over time (Kane et al., 2017).

McKinsey & Company found that 80% of the companies surveyed started with a digital transformation. Still, only 14% reported an improvement in their performance, while only 3% indicated that the change had succeeded, confirming the challenge of digital transformation (Villaplana and Stein, 2019). Some of the most common organizational barriers to digital transformation are unclear vision and goal of digital transformation; lack of management understanding, knowledge, and experience; lack of leadership skills; lack of organizational agility; rewards and incentives that are not aligned with digital transformation; unclear measurement and reward system; lack of employee engagement; and employee resistance to change (Mirković et al., 2019).

Likewise, according to Kohnke (2017), the main barriers to digital transformation concerning organizational design are a lack of sense of urgency; unclear roles and responsibilities; unadjusted and rigid organizational culture; lack of internal talent for digital projects; inability to react quickly; failure to adopt an experimental and innovative culture; and inflexible business processes. In this context, organizational culture is increasingly seen as the main obstacle to digital transformation and effectiveness (Teichert, 2019). A culture conducive to digital transformation is a hallmark of maturing companies. These organizations have a strong propensity to encourage risk-taking, foster innovation, and develop collaborative work environments. Overcoming risk aversion is the most critical characteristic of digitally maturing cultures. They have conquered this cultural barrier by encouraging their organizations to experiment and accept the risk of failure (Kane et al., 2017).

Employees of digitally mature organizations describe their culture as more collaborative and innovative than other organizations and state that leadership has sufficient digital skills (Kane et al., 2015). Consistently research shows that around 80% of companies that focus on organizational culture consistently achieve high productivity results (Hemerling et al., 2018). Kanter (2001) proposes several characteristics of digital culture: continuously promote disruptive change, communicate fluidly inside and outside the organization, collaborate in the creation and delivery of value within the company and with third parties, share knowledge and create a shared identity, along with doing all the above quickly and agilely.

Overcoming risk aversion in digitally mature cultures and companies are primarily described by a culture of adaptability, meaning organizational learning, customer focus, and creating change. It is also relevant to a culture of ownership, which includes empowerment and team orientation. These cultural traits indicate higher levels of product and service innovation, creativity, and rapid response to changing customer and employee needs (Teichert, 2019).

In Chile, little research has focused on digital culture as a relevant dimension to boost digital transformation and maturity. A critical study was developed by the Santiago Chamber of Commerce, CORFO, and the PMG consulting firm, which presented the results of the fourth version of the Digital Transformation Index (ITD, 2021). These latest results detected an acceleration of digital transformation as an effect of the pandemic, where large companies increased the digitalization of their processes, especially those in the early stages. However, this increase in digital maturity was proportional to the level of maturity before the pandemic (ITD, 2021).

According to The Virtus Digital Maturity Index (IMDV), Chilean organizations' digital maturity has evolved slowly despite the pandemic. Although there has been a significant leap in the incorporation of new technologies and processes, 67% of the largest companies in the country have the purpose of boosting a digital transformation. Only 52% have a clear and robust action plan to carry it out, explaining the quick 6.4% advance in digitalization compared to 2020. Therefore, the perception of high executives in large companies can help us identify factors that favor or hinder this adaptation process and recognize some blind spots of the system as a whole.

3. Methodology

Research design is empirical, non-probabilistic, cross-sectional, qualitative-quantitative, and exploratory. The research instrument uses the Delphi methodology, a systemic and interactive research tool that aims to obtain consensus through the compilation of specialized knowledge from a panel of independent experts on a specific and complex topic that would otherwise be difficult to study. The

methodology uses questionnaires repeatedly sent individually, and results are returned in the form of feedback, creating a representative opinion of the group (Hallowell and Gambatese, 2010).

To guarantee results quality, four stages were conducted according to the research methodology: Formulation of the problem, selection of experts, elaboration, and launch of the questionnaires, and data analysis. High executives of large companies in Chile were considered the universe, where large companies are those composed of 200 or more workers (OCDE, 2010). The expert panel was selected with strategic criteria, given that a random selection is not acceptable for this methodology (Ludwig, 1997). The research problem conditions the expert's profile and inclusion criteria (Needham and de Loë, 1990), considering practical knowledge, up-to-date experience on the subject, and having high decision-making positions in large companies in Chile, such as area managers, general managers, CEOs, CFOs, or board members. According to Mintzberg (1980), these positions are considered the strategic apex, responsible for deciding and implementing the company's strategy. Other inclusion criteria were the variety of business sectors and willingness to participate (Ludwig, 1997; Hung et al., 2008).

Powell (2003) states that the number of experts may vary according to the research problem and available resources. Some panelists may drop out of the study due to other commitments or disinterest. Therefore, enough experts must be selected at the beginning of the process to ensure a qualified panel at the end of the study if some do not complete all rounds.

If the number of experts is too small, the information offered cannot be considered representative because the error decreases significantly for each expert added until it reaches seven. If the panel size exceeds 30, the prospecting improvement is minimal, so the cost increase does not compensate for that improvement (Astigarraga, 2003). Ludwig (1997) concludes that most Delphi studies use between 15 and 20 experts, while Landeta (1999) proposes between 7 and 30 participants.

According to the criteria mentioned above, the process of expert's selection began with an initial list of 50 possible candidates, to whom a formal proposal was sent by email with a brief description of the objectives, the expected number of rounds, and the estimated time of the complete process. Afterward, 32 experts responded with their willingness to participate and committed to the first round, 26 answered the second round, and 23 answered the third round of questionnaires. The data-gathering process is shown in Figure 1 and took place between April and May 2022.

An individual survey link was provided to the experts *via* email to ensure anonymity. An identifier code was assigned to each questionnaire to guarantee the confidentiality of the responses. The time laps between receiving and responding to each round were 2 weeks.

The sample included senior executives in the areas of financial services (3), services and it (4), food and beverages (2), telecommunications (3), logistics and supply chain (2), insurance (2), human resources services (2), health area (3), the energy sector (2 experts), construction sector (2), real estate sector (2), the automotive sector (1), the aeronautics and aviation sector (1), retail, textile and fashion industry (3). the positions held by the experts were general manager (3), area manager (13), deputy area manager (12), CEO (1), CIO (2), and director (1).

The initial questionnaire proposed a list of 14 factors from the literature, asking the panel of experts to indicate if each factor Does not contribute to the achievement of a digital culture, if it Hinders the achievement of a digital culture, or Favors it.

The second round added 12 new factors and two new dimensions (digital skills and technology) because of the experts' proposals, increasing the total number of items in this questionnaire to 26. In this

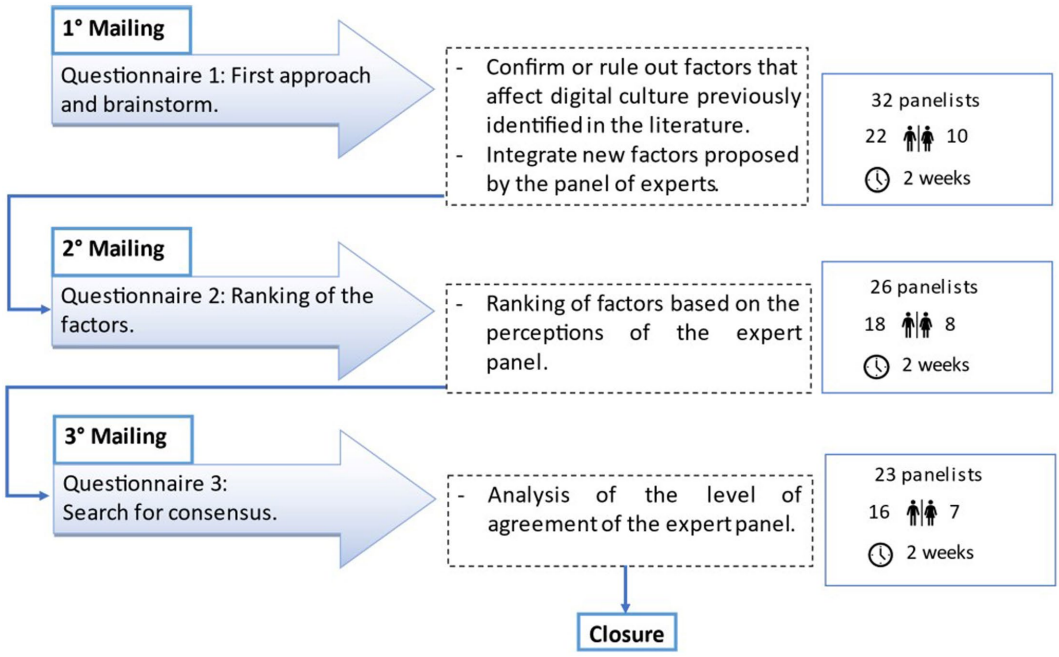

FIGURE 1
Data gathering process.

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round, experts were asked to evaluate the importance of each factor associated with the acquisition of digital culture in large organizations in Chile, using a five-point Likert scale (1 = Not important, 2 = Somewhat significant, 3 = Moderately important, 4 = Important and 5 = Very important). The complete list of factors and their definitions grouped into five dimensions can be seen in Table 1.

In the last round, the experts were presented with three pieces of data: the eight factors that did not reach consensus in the second round, the score that the expert provided, and the average score of the responses considering all participants from the previous round. After reviewing the group statistics, each participant decided whether to change or keep their last answer. In addition, we included an open

TABLE 1 Complete list of factors and definitions grouped into dimensions.

Factors	Definition
Digital culture	
Customer orientation	Develop a rapid and efficient response capacity to customers' changing needs (business models, processes, etc.).
Culture is open to change	Develop a capacity to adapt quickly to changes.
Tolerance for failure	Raise awareness within the organization that error is part of learning in the digital culture.
Experimental and innovative culture	Continuously experiment with digital technology and prototypes at low costs.
Risk tolerance	Encourage the organization to take risks.
Rewards and incentives aligned with digital transformation	Create reward systems to strengthen the position and development of highly qualified personnel (promotions, bonuses, awards, etc.).
Digital agility	Promote proactivity, adaptability, and a quick and adequate response to changes in the environment
Open communication	Develop virtual spaces to work collaboratively (e.g., JIRA, Teamwork Project Management, Microsoft SharePoint, etc.).
Integration of multifunctional teams	Encourage the generation of multifunctional/multidisciplinary teams to implement digital initiatives.
Disruptive change	Continuously promote disruptive changes within the organization.
Knowledge sharing	Create working groups uniting the digital generation and employees with experiences, generating intergenerational support.
Digital identity.	Generate a shared identity within the organization around digital.
Resistance to organizational change	Employee resistance to change, lack of participation, and commitment to supporting the company's digital transformation.
Effective organizational communication	Generate spaces for inter-hierarchical communication related to digital transformation within the company.
Digital Leadership	
Digital leadership skills and abilities	Develop leadership (from top management) toward digital use of new technologies.
Digital leadership actions	Organizational leaders (senior management and directors) must build a supportive culture that encompasses collaboration, risk-taking, and experimentation.
Digital strategy	
Strategy alignment	Has a digital strategy aligned with the corporate strategy at a functional and operational level?
Clear vision and objectives of digital transformation.	Present a clear vision and objectives around the digital transformation both in the medium and long term.
Strategic business metrics to lead digital initiatives.	Successful digital initiatives require leaders to frame performance objectives around business goals defined by data rather than technical capabilities.
Organizational change management.	Properly manage the change, communicating the expectations and expected impacts.
Develop an area/team focused on organizational change management.	Develop a company change management area/team with a clear methodology.
Digital skills	
Training and digital education of employees	Permanently invest (at all levels of the company) in digital training of employees so that they develop up-to-date technological skills (e.g., Training)
Talent management.	Selectively invest in the most talented people and those most adaptable, curious, and flexible to develop, attract and retain the best talent.
Comprehensive development of digital skills and abilities.	Invest in the comprehensive development of digital skills and capabilities aligned with the company's strategy.
Technologies	
Transformation and improvements of digital platforms (automation of core processes)	Integrate digital initiatives (Digitalization of information, processes, etc.) throughout the organization.
Digital skills.	Promote tools within the company without the need for very advanced programming knowledge.

question for each item, asking why they chose to maintain or reconsider their previous score. This analysis allows for a measure of consensus and the convergence of opinions, reducing variation in the responses, and providing additional information on the interpretation and why the experts disagreed on the disputed factors (Heiko, 2012).

This research methodology was chosen because of its flexibility to adapt to many scientific disciplines. The method also uses controlled feedback that allows participants to reflect on a specific issue and participatory nature in constructing meaning among experts. In addition, it uses anonymity to avoid group think and the possibility of gathering qualitative and quantitative data to enrich the analysis process (Almenara and Moro, 2014; Reguant Álvarez and Torrado Fonseca, 2016; López Gómez, 2018). The Delphi method is widely used for organizational studies (Bhardwaj and Patnaik, 2019; García-Vidal et al., 2021; Kerpedzhiev et al., 2021; Vax et al., 2021) and project management research (Cafiso et al., 2013; Gajić and Palčič, 2019; Naji et al., 2022), including areas as different as civil engineering (Kermanshachi et al., 2020), health (Nasa et al., 2021), technology (Andersen, 2022), among many others.

Some recent work on organizational digital transformation explored which business process management capability areas will become relevant in view of digitalization (Kerpedzhiev et al., 2021). Using a Delphi study with international experts from industry and academia, this study updated business process management capability framework and identified challenges and opportunities. Related to organizational culture, García-Vidal et al. (2021) examined the relationships between organizational values and the performance indicators of an organization using a Delphi method. This study sampled two work teams and proved the relationship between values and customer satisfaction directly and productivity indirectly. Cafiso et al. (2013) used the Delphi method to evaluate opinions of public transport managers on bus safety. After a multi-round Delphi process, Kendall's algorithm was used to evaluate the level of concordance, showing that the majority of the proposed items were considered to have great potential for improving bus safety.

4. Results

A summary of the methodological objectives, inputs, and outputs during the three rounds is presented as a flow chart in Figure 2. Each round is rigorously analyzed in the following subsections.

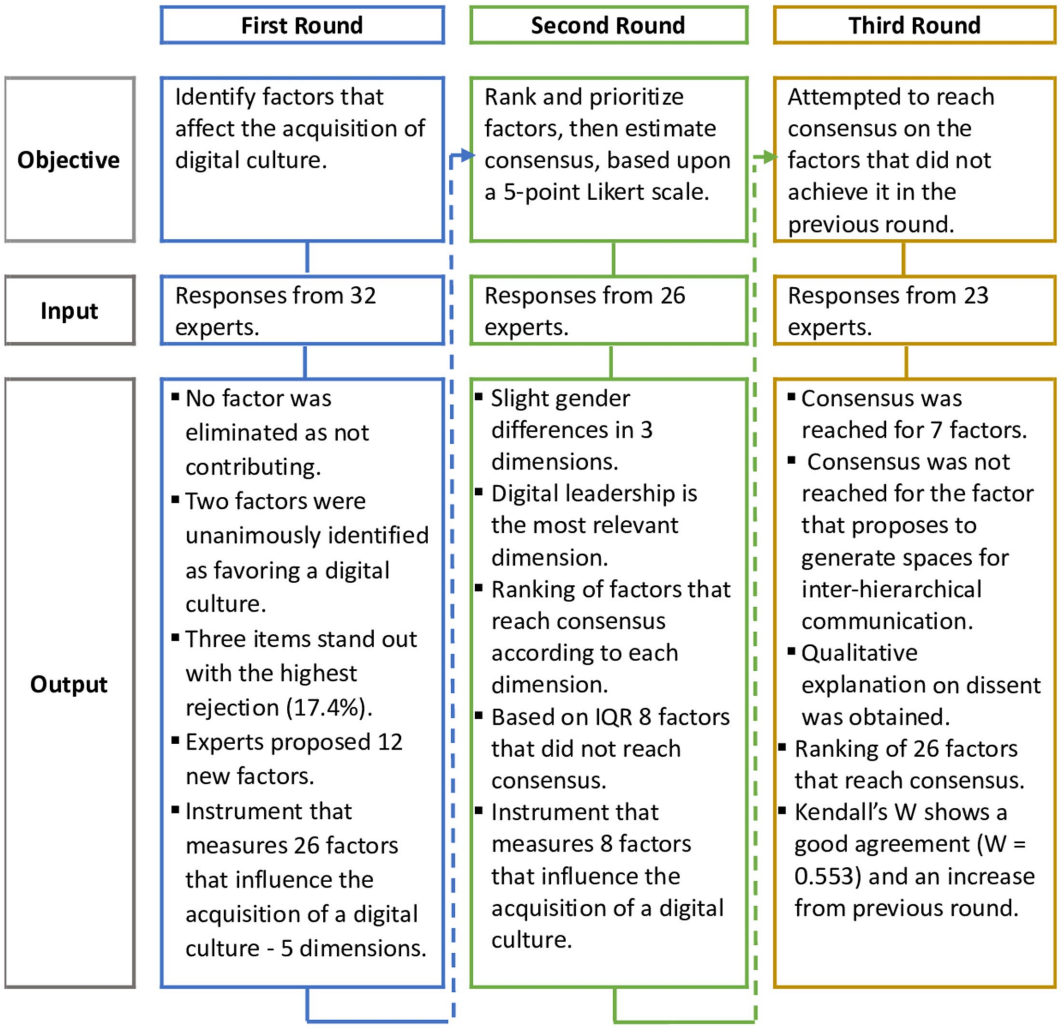

FIGURE 2
Objectives, inputs, and outputs for all three rounds.

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4.1. First round

This first round intended to identify experts' impressions on the factors that affect the acquisition of digital culture in large organizations in Chile. Data analysis identified 12 factors that had not been considered, and no factor was eliminated as not contributing to digital culture. Results can be seen in Table 2.

Two factors were unanimously identified as "favoring the achievement" of a digital culture: a clear vision and goals about digital transformation, and a digital strategy aligned with the corporate strategy at a functional and operational level. All other items were described by at least one expert as "not contributing to the achievement" of a digital culture and are considered in the next round because there is no consensus on the extent of their contribution. Three items stand out, with the highest rejection being 17.4%: present a shared identity around digital transformation, motivate employees through incentives that align with digital transformation, and encourage effective communication.

Five items were chosen from factors that consider how difficult the achievement of a digital culture is. Most of them have a very low percentage; however, continuously promote disruptive change stands out with a percentage of 17.14%.

Finally, the open question allowed participants to indicate factors that had not been mentioned previously and encouraged them to brainstorm about factors that had been overlooked. Among the most common responses were factors related to tolerance of failure, ways to properly manage change or learn from mistakes, leadership commitment to the digital culture project, training and digital education of employees, and orientation focused on customer needs, among others. These factors were included in the next round and made up for the 26 factors that influence the acquisition of a digital culture in large Chilean organizations, distributed in five dimensions (i.e., digital culture, digital leadership, digital strategy, digital skills, and technologies), which were previously presented and defined in Table 1.

4.2. Second round

The responses to this round allowed us to rank and prioritize factors and to establish the degree of dispersion of the responses. Although there is no single way to estimate consensus (Hallowell and Gambatese, 2010; Heiko, 2012), for this study, the main statistics are measures of central tendency and dispersion: media, maximum, minimum, interquartile range (IQR), and average range. In this case, media is the measure that best represents group opinion (Landeta, 1999), showing that digital leadership (5.0) is the most relevant dimension, followed by digital strategy (4.7). We can find digital culture (4.1), digital skills (4.0), and technology (4.0) with lower evaluations.

From a gender perspective, the media shows some differences in three dimensions: digital strategy, digital culture, and technology. For digital strategy, men indicate value with a media of 4.8, whereas women establish a media of 4.4. For the digital culture dimension, women were also stricter with an average of 4, whereas men averaged 4.3. Unlike the previous dimension, for technology, evaluations are frequently different for all factors. The main difference is regarding the item promote the use of digital tools within the company without the need for very advanced programming knowledge, where male experts average 4, whereas female experts average 3.5. Despite this variation between genders, all experts consider this item to be the least relevant category for digital culture success in large companies.

The maximum and the minimum indicate the extreme responses, whereas the IQR presents the location of the central half of the responses to measure the dispersion of the sample, which is inversely proportional to the group consensus (Climent et al., 2014). Based on this statistical analysis, we decided whether to keep or eliminate factors for the next round. If the item has an IQR that is less than or equal to 1, it is eliminated from the following questionnaire because consensus has been reached. We also estimated the average range, which is a more accurate measure than the average, because it allows us to distinguish factors with the same average and position them within a ranking. Based upon a 5-point Likert scale, the results of this round are presented in Table 3.

TABLE 2 Results from the first questionnaire.

Factors	Does not contribute	Difficulty's the achievement	Favor's the achievement
Continuously promote disruptive change	8.57%	17.14%	74.29%
Present a clear vision and goals for digital transformation	0	0	100%
Present a shared identity around the digital	17.14%	0	82.86%
Present a digital strategy aligned with the corporate strategy at a functional and operational level	0	0	100%
Motivate employees through incentives aligned with digital transformation	17.14%	0	82.86%
Encourage collaboration, risk-taking, and experimentation	11.43%	0	88.57%
Encourage risk-taking	14.29%	5.71%	80%
Foster the integration of cross-functional teams to implement digital initiatives	2.86%	2.86%	94.29%
Encourage cooperation between employees	14.29%	0	85.71%
Encourage effective communication.	17.14%	2.86%	80%
Develop an experimental and innovative culture	8.57%	0%	91.43%
Develop a collaborative culture	14.29%	0	85.71%
Develop a capacity for rapid adaptation	5.71%	2.86%	91.43%
Develop digital skills in senior management leaders	8.57%	0	91.43%

TABLE 3 Results for the second-round questionnaire.

Factors	Min.	Max.	Med.	IQR	Average range	Ranking	Consensus
Digital culture							
Encourage the generation of multifunctional/multidisciplinary teams to implement digital initiatives.	4	5	5	1	18.15	1	Yes
Raise awareness within the organization that error is a part of learning in the digital culture.	3	5	4.5	1	16.73	2	Yes
Generate a shared identity around digital within the organization.	3	5	4.5	1	16.40	3	Yes
Develop a capacity to adapt quickly to changes.	3	5	4	1	16.23	4	Yes
Promote proactivity, adaptability, and a quick and adequate response to changes in the environment	3	5	4	1	14.54	5	Yes
Develop a rapid and efficient response capacity to customers' changing needs (business models, processes, etc.).	2	5	4.5	1.25	14.44	6	No
Encourage the organization to take risks.	3	5	4	1	14.25	7	Yes
Create working groups that unite the digital generation and the employees with experience to generate intergenerational support.	3	5	4	2	12.79	8	No
Continuously conduct low-cost experiments with digital technologies and/or prototypes.	1	5	4	2	12.29	9	No
Generate spaces for inter-hierarchical communication regarding digital transformation within companies.	2	5	4	2	10.04	10	No
Develop virtual spaces to work collaboratively (e.g., JIRA, Teamwork Project Management, Microsoft SharePoint, etc.).	1	5	4	1.25	9.81	11	No
Identify employee resistance to change and lack of participation and commitment to support the digital transformation of the company.	1	5	4	1.25	8.94	12	No
Continuously promote disruptive changes within the organization.	2	5	4	1.25	8.23	13	No
Create reward systems to strengthen the position and growth of highly qualified personnel (e.g., promotions, bonuses, awards, etc.)	1	5	3.5	1	4.94	14	Yes
Digital leadership							
Build a supportive culture that encompasses collaboration, risk taking, and experimentation through organizational leaders (senior management and/or directors).	3	5	5	1	18.10	1	Yes
Develop leadership (from top to bottom management) toward digital to use new technologies.	3	5	5	1	18.10	2	Yes
Digital strategy							
Present a digital strategy that aligns with the corporate strategy at a functional and operational level.	4	5	5	1	20.23	1	Yes
Define key results in KPI format.	3	5	5	1	17.67	2	Yes
Present a clear vision and objectives for digital transformation both in the medium and long term.	3	5	4.5	1	17.15	3	Yes
Properly manage change and communicate the expectations and predicted impacts to the employees.	3	5	4.5	1	15.77	4	Yes
Develop a change management area/team with a clear methodology within the company.	1	5	4	1	13.75	5	Yes
Digital Skills							
Invest in the comprehensive development of digital skills and abilities that align with the company's strategy.	2	5	4	1	14.44	1	Yes
Permanently invest in digital training of employees at all levels of the company to develop up-to-date technological skills (e.g., training).	1	5	4	1	13.25	2	Yes
Selectively invest in the most talented, adaptable, curious and flexible people to develop, attract and retain the best talent in the field.	2	5	4	1	7.58	3	Yes
Technological resources							
Integrate digital initiatives (e.g., digitization of information, processes, etc.) throughout the company.	3	5	4	0.25	12.27	1	Yes
Promote the use of digital tools within the company without needing very advanced programming knowledge.	1	5	4	1.25	4.81	2	No

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To complement the search for consensus that was determined by the IQR, we analyzed Kendall's W (also known as Kendell's coefficient of concordance). This non-parametric statistic is used to determine the degree of correlation between qualitative ordinal variables, which makes it possible to measure the agreement, the relative strength and the change in the experts' responses (Heiko, 2012). Schmidt (1997) suggest the following interpretation (see Table 4).

For this round, Kendall's W was measured to compare the degree of agreement obtained among factors that did or did not manage to reach consensus. As shown in Table 5, there is significant agreement between the scores assigned to the factors that reached consensus, evaluated as a good agreement (0.513). For the eight factors that did not reach consensus, Kendall's W can be interpreted as a moderate agreement (0.424).

TABLE 4 Kendall's W (coefficient of concordance), based on Schmidt (1997).

W	Interpretation
$W < 0.3$	Weak agreement
$0.3 < W < 0.5$	Moderate agreement
$0.5 < W < 0.7$	Good agreement
$W > 0.7$	Strong agreement

TABLE 5 Agreement index of factors with or without consensus in the 2nd round.

Statistics	Factors that reached agreement	Factors that did not reach agreement
Amount of experts	23	23
Kendall's W	0.513	0.424
Significance level	<0.001	<0.001

4.3. Third round

In this last phase, according to the Delphi protocol, the experts attempted to reach a consensus on the factors that did not achieve agreement in the previous round. For the third questionnaire, consensus was reached for all factors, except for one that proposes to generate spaces for inter-hierarchical communication related to digital transformation within companies, which presented a greater dispersion in the scores and extremes of 2–5 points.

In this round, the factor that managed to position itself as the most relevant was develop a rapid and efficient response capacity to the changing needs of customers (Media = 5). Table 6 presents the results of this third questionnaire.

Finally, the round of questionnaires concludes when the desired degree of stability and consensus has been achieved. The calculation of Kendall's W considers all of the factors that reached an acceptable level of consensus and shows a significant agreement and an increase in the degree of agreement between participants, corresponding to a good agreement (W = 0.553). Table 7 shows the final ranking of all 26 factors that reached consensus.

5. Discussion

The results can be divided in two categories: those that are aligned with the literature and those that are not. This represents a risk in achieving a digital culture in large Chilean companies.

According to high executives, digital leadership is the most relevant dimension to achieve a digital culture in large Chilean companies, followed by the digital strategy dimension. The medias show a high level of agreement among experts, and the IQR shows that there is little variability, indicating stability in the responses and consensus when ranking factors, regardless of gender differences.

One of the lessons learned from the COVID-19 pandemic and the acceleration of digital transformation in Chile (ITD, 2021) is that the entire management team must be involved in the digital culture

TABLE 6 Results from the third questionnaire.

Factors	Min.	Max.	Med.	IQR	Average range	Consensus
Develop the capacity to provide rapid and efficient responses to changing customer needs (e.g., business models, processes, etc.).	2	5	5	1	6.17	Yes
Generate spaces for inter-hierarchical communication regarding digital transformation within companies.	2	5	4	2	4.26	No
Develop virtual spaces to work collaboratively (e.g., JIRA, Teamwork Project Management, Microsoft SharePoint, etc.).	1	5	4	0	4.28	Yes
Continuously conduct low-cost experiments with digital technologies and/or prototypes.	1	5	4	1	5.33	Yes
Promote the use of digital tools within the company without needing very advanced programming knowledge.	1	5	4	1	2.72	Yes
Continuously promote disruptive changes within the organization.	2	5	4	1	3.74	Yes
Create working groups that unit the digital generation and the employees with experience to generate intergenerational support.	3	5	4	1	5.74	Yes
Identify employee resistance to change and lack of participation and commitment to support the company's digital transformation.	1	5	4	1	3.76	Yes

TABLE 7 Ranking of factors that promote a digital culture in large companies in Chile.

Factors	Ranking
Align digital strategy with the corporate strategy at a functional and operational level.	1
Encourage the generation of multifunctional/multidisciplinary teams to implement digital initiatives.	2
Build a supportive culture that encompasses collaboration, risk taking, and experimentation through organizational leaders (senior management and/or directors).	3
Develop leadership (from top to bottom management) toward digital to use new technologies.	4
Define key results in KPI format.	5
Develop the capacity to provide rapid and efficient responses to changing customer needs (e.g., business models, processes, etc.).	6
Present a clear vision and objectives around digital transformation both in the medium and long term.	7
Raise awareness within the organization that errors are a part of learning in the digital culture.	8
Generate a shared identity around digital within the organization.	9
Properly manage change and communicate expectations and predicted impacts to the employees.	10
Develop a capacity to quickly adapt to changes.	11
Promote agility within the organization.	12
Invest in the comprehensive development of digital skills and abilities that align with the company's strategy.	13
Encourage employees in creative areas (e.g., R&D, Marketing, HR, etc.) to take risks.	14
Develop a change management area/team with a clear methodology within the company.	15
Create working groups that unite the digital generation and the employees with experience to generate intergenerational support.	16
Permanently invest in digital training of employees at all levels of the company to develop up-to-date technological skills (e.g., training).	17
Integrate digital initiatives (e.g., digitization of information, processes, etc.) throughout the company.	18
Continuously conduct low-cost experiments with digital technologies and/or prototypes.	19
Generate spaces for inter-hierarchical communication regarding digital transformation within the company.	20
Develop virtual spaces to work collaboratively (e.g., JIRA, Teamwork Project Management, Microsoft SharePoint, etc.).	21
Identify employee resistance to change and lack of participation and commitment to support the company's digital transformation.	22
Continuously promote disruptive changes within the organization.	23
Selectively invest in the most talented, adaptable, curious and flexible people to develop, attract and retain the best talent in the field.	24
Promote the use of digital tools within the company without needing very advanced programming knowledge.	25
Create reward systems to strengthen the position and growth of highly qualified personnel (e.g., promotions, bonuses, awards, etc.).	26

process, including betting on people and technology, which is mentioned by some of the expert panelists. Nevertheless, the following attributes covered in this study must be fostered and enhanced in a comprehensive manner to achieve a real impact on employees: Share authority and power as leaders who are facilitators and motivational trainers, exchange information and knowledge, promote collaborative work to foster a digital environment where collaborators can develop their full potential and demonstrate all of their abilities, encourage creativity and innovation, and promote internal communication with the corresponding digital tools (Cortellazzo et al., 2019; Gabryelczyk, 2020).

Another result that is consistent with the literature is the idea among high executives that a digital culture can be reached when the digital transformation aligns with the company's strategy. The results from the first questionnaire show that all of the experts consider this to be a favorable factor to achieve a digital culture in large Chilean organizations, which is confirmed in the second-round, positioning it as one of the most relevant factors. This is consistent with the literature that focuses on organizational change and the creation of flexibility to adapt to changing digital environments. However, creating an effective strategy and linking it to the overall goals of a business remains one of the biggest challenges preventing companies from increasing digital maturity (Kane et al., 2017).

The expert panel identified investing in digital skills as a relevant dimension in the acquisition of a digital culture. After the first-round, the participants suggested factors that are associated with digital learning to empower and help businesses overcome the challenges that arise with digital transformation. This dimension was added in the second-round and was evaluated as an important dimension for achieving a digital culture (Media = 4.0), in accordance with the literature (Ochoa, 2016; Villaplana and Stein, 2019).

The final observation relates to the relationship among organizational culture and its effects on digital maturity. According to participants, to acquire a digital culture, the following factors are relevant: encourage the generation of multifunctional/multidisciplinary teams to implement digital initiatives, exercise a culture of tolerance toward failure, develop a capacity to rapidly adapt to change, and encourage employees in creative areas to take risks.

Therefore, in accordance with the literature, digitally mature organizations accept failure as a natural part of experimenting with new initiatives, actively implement initiatives to increase agility in response to changing markets, value and encourage experimentation

and testing as a means of organizational learning, recognize and reward collaboration between teams, acknowledge divisions as part of the operating model, and increasingly organize around cross-functional project teams to implement digital businesses (Chanias and Hess, 2016; Kane et al., 2017).

On the other hand, when analyzing the results, there are several details that do not match the literature, raising concerns on the aspects that hinder the leadership of Chilean high executives who aim to achieve digital cultures and to create digitally mature companies.

We found three factors that were described by some participants as not contributing to digital culture that, according to Teichert (2019), are among the most represented cultural attributes in all digital maturity models: encourage risk taking, encourage cooperation among employees, and develop a collaborative culture. The success of a digital culture is determined through collective work and information exchange between divisions, units, and roles, where collaboration is valued more than individual effort and where coordinating tasks effectively, integrating employees, and carrying out the mission, vision and values of the organization is not possible without effective organizational communication (Hemerling et al., 2018).

On the other hand, the literature highlights the relevance of implementing a reward and incentive system that aligns with the acquisition of a digital culture (Mirković et al., 2019), although the results from the first round of this study slightly contradict this matter. After the first round, 17.14% of experts considered creating a reward system to strengthen the position and growth of highly qualified personnel to be a factor that does not contribute to achieving a digital culture. In the second-round questionnaire, this item was valued as the least relevant for achieving such success (Media = 3.5), presenting a high level of agreement among the panel of experts that can be explained by Chileans hierarchical organizational cultures (Rodríguez, 2011).

Another misalignment between the representatives of large Chilean companies' strategic apex and the international literature is the rejection (17.4% in the first-round) caused by continuously promoting disruptive changes within the organization. After the second round, this factor was ranked 23, near the end of the list of 26 factors. This result raises questions on the meaning that some companies in Chile attribute to the need to move away from stability. In companies, digital disruption is defined as an alteration produced by a shift due to the development of new technologies that completely changes business models and affects the entire corporate structure (Roblek et al., 2021). Therefore, digital transformation and disruptive technologies facilitate the creation of solutions, whereas agile working formats adapt to these constant changes (Lucas and Goh, 2009).

High executives often cling to the status quo and traditions, rather than being open and committed to adaptive change. The current volatile environment in Chile and around the world is influenced by economic, social, technological, and political changes and has generated a significant level of stress among high executives (ITD, 2021), who, after numerous decades, had become accustomed to a stable context where conservative and low-diversity countries such as Chile could succeed.

Chilean labor culture is characterized by gradual change over disruption, hierarchical leadership over collaboration, loyalty over performance, the company's internal process over the client, betting on what works over innovation, focusing on the task over the purpose, and short-term results over value creation. For this kind of organizational culture, it is easier to understand digital transformation as an investment in new technologies rather than as a constant promotion of disruptive change, which creates a blind spot for achieving digital maturity (CLA-Icare, 2021).

Another example of this tendency toward a more conservative strategic approach is the factor that did not reach consensus and was left out of the final list of factors: generate spaces for inter-hierarchical communication regarding digital transformation within companies. This factor encompasses effective organizational communication within companies, both vertical and horizontal, that encourages interactions between the strategic apex and employees to increase productivity, knowledge exchange, and collaboration. However, a lack of effective internal communication demotivates employees and makes it difficult to attract talent.

6. Conclusion

The research question for this study was the following: What factors favor or hinder the acquisition of a digital culture in large Chilean organizations? The aim was to rank factors that promote a digital culture based on the perceptions of senior executives by using the Delphi method.

The contributions made by this research allow the management of big Chilean companies to become aware of several factors that are not considered as relevant as leadership and strategy, which hinders their ability to achieve a digital culture. In addition, these findings help senior executives of large companies promote a culture that fosters a successful digitalization process while recognizing the cultural factors that influence the success or failure of digital transformation initiatives. Furthermore, this study contributes to the literature by compiling the most relevant factors that any strategic leader should focus on when facing a digital transformation (see Table 3). Some research limitations regarding the applied methodology are mainly the number of rounds and number of participants. Both are related to limited resources and deadlines, and although the final number of participants conforms to Landeta's (1999) recommendations for this method, additional experts may have suggested factors not found in this study. Likewise, as the rounds of questionnaires progress, the number of experts decreases, so there is data lost due to this lack of continuity.

On the other hand, this study was carried out with experts belonging to various industries, obtaining a general representation of the factors that affect the acquisition of a digital culture for large companies in Chile. Therefore, it is recommended that future research also consider and analyze the differences and similarities between industries, to gain a deeper understanding of the challenges of achieving an organizational digital culture when embracing the strategic objective of a digital transformation.

An interesting result comparison could be done using the same instruments but among large companies' workers that are not part of the strategic apex. The relevance of leadership and strategy factors opposed to the "*relevance of generating spaces for inter-hierarchical communication*" may be explained by the sample's position in the organizational structure, showing a significant blind spot among strategic decision makers. We also propose to develop the same research in large public organizations in Chile to compare results, identify weaknesses in the achievement of e-government and identify strengths and weaknesses to promote a digital labor culture as a country.

Given that organizational leaders are aware of most of the factors related to achieving a digital culture, future lines of research can focus on their achievement, evaluating implementation plans. Another line of research suggested is to focus on the slight gender differences observed. The relative lower evaluations made by women in the sample can raise new questions that can be answered by a more accurate statistical analysis and complemented by qualitative methodologies in search for deeper explanations.

In regard to digital cultures in large Chilean companies, the participants of the expert panel show a high level of agreement about the importance of factors that are primarily related to two dimensions: *digital strategy* and *digital leadership*.

Notably, the participants expressed concern about implementing technology through a workforce with digital skills, where the decision to replace the existing workforce should shift toward constant digital training to make this digital transformation sustainable.

However, large Chilean companies must pay attention to the conservative triad of factors that characterize Chilean work culture: the belief that changes are exclusively possible when commanded by the strategic apex of senior executives, a hierarchical work culture that prevents collaborative work, and the rejection of disruptive change. These factors and cultural characteristics of the majority of Chilean companies will most likely hinder any attempt to accomplish a digital transformation plan.

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

CB and FG contributed to conception and design of the study and oversaw the methodological process and statistical analysis. CB wrote the first draft of the manuscript. MA contacted the sample and performed the methodology and the statistical analysis. 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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References

Aengenheyster, S., Cuhls, K., Gerhold, L., Heiskanen-Schüttler, M., Huck, J., and Muszynska, M. (2017). Real-time Delphi in practice—a comparative analysis of existing software-based tools. *Technol. Forecast. Soc. Change* 118, 15–27. doi: 10.1016/j.techfore.2017.01.023

Almenara, J. C., and Moro, A. I. (2014). Empleo del método Delphi y su empleo en la investigación en comunicación y educación. *EDUTEC Rev. Electrónica Tecnol. Educ.* 48:a272. doi: 10.21556/edutec.2014.48.187

Andersen, P. D. (2022). Constructing Delphi statements for technology foresight. Futures & foresight. *Science* 1–15. doi: 10.1002/ffo2.144

Astigarraga, E. (2003). El método delphi. *San Sebastián Univ. Deusto* 14, 2–14.

Berman, S. J. (2012). Digital transformation: Opportunities to create new business models. *Strategy Leadersh* 40, 16–24. doi: 10.1108/10878571211209314

Berman, S., and Marshall, A. (2014). The next digital transformation: from an individual-centered to an everyone-to-everyone economy. *Strategy Leadersh.* 42, 9–17. doi: 10.1108/SL-07-2014-0048

Bertini, P. (2016). *Focus on technology hinders true digital transformation*. Available at: https://www.brandknewmag.com/focus-on-technology-hinders-true-digital-transformation/

Bhardwaj, S., and Patnaik, S. (2019). People analytics: challenges and opportunities–a study using Delphi method. *IUP J. Manage. Res.* 18, 7–23.

Bloomberg, J. (2018). Digitization, digitalization, and digital transformation: confuse them at your peril. *Forbes* 28:2019.

Cafiso, S., Di Graziano, A., and Pappalardo, G. (2013). Using the Delphi method to evaluate opinions of public transport managers on bus safety. *Saf. Sci.* 57, 254–263. doi: 10.1016/j.ssci.2013.03.001

Chanias, S., and Hess, T. (2016). *How digital are we? Maturity models for the assessment of a company's status in the digital transformation* Manag. Report Institut Für Wirtsch. LMU Munich, Munich School of Management, Institute for Information Systems and New Media. 1–14.

CLA-Icare (2021). Reporte 2021 Cultura Digital. Available at: https://icare.cl/assets/uploads/2022/04/reporte-3-estudio-cultura-digital-2022-cla-consulting-icare.pdf

Clarke, S. (2014). *Your digital journey is being mapped by your customers* . MIT Sloan Management Review. Available at: https://www.slideshare.net/capgemini/mit-digital-journey-2014

Climent, V. C., Navarro, A. M., and Palacio, J. R. S. (2014). El método Delphi como técnica de diagnóstico estratégico. Estudio empírico aplicado a las empresas de inserción en España. *Rev. Eur. Dir. Econ. Empresa* 23, 72–81. doi: 10.1016/j.redee.2013.06.002

Cortellazzo, L., Bruni, E., and Zampieri, R. (2019). The role of leadership in a digitalized world: a review. *Front. Psychol.* 10:1938. doi: 10.3389/fpsyg.2019.01938

Douglas, M. (1996). *Natural symbols*, *2nd* Edn. London and New York: Routledge.

Ebert, C., and Henrique, C. (2018). Digital transformation. *IEEE Softw.* 35, 16–21. doi: 10.1109/MS.2018.2801537

Gabryelczyk, R. (2020). Has COVID-19 accelerated digital transformation? Initial lessons learned for public administrations. *Inf. Syst. Manag.* 37, 303–309. doi: 10.1080/10580530.2020.1820633

Gajić, S., and Palčič, I. (2019). A new framework for complexity analysis in international development projects–results from a Delphi study. *Adv. Product. Engineer. Manage.* 14, 225–238. doi: 10.14743/apem2019.2.324

Galliers, B., and Jarvenpaa, S. (2010). Understanding digital transformation. *J. Strateg. Inf. Syst.* 19, 143–144. doi: 10.1016/j.jsis.2010.09.001

García-Vidal, G., Sánchez-Rodríguez, A., Pérez-Campdesuñer, R., and Martínez-Vivar, R. (2021). Exploring the relationship between organizational values and small team performance: a Delphi method application. *Serbian J. Manage.* 16, 61–83. doi: 10.5937/sjm16-22675

Garibaldi, A., Wetzel, U., and Ferreira, V. (2009). Organizational culture and performan a Brazilian case. *Manag. Res. News* 32, 99–119. doi: 10.1108/01409170910927578

Geertz, C. (1973). "Chapter 1/thick description: Toward an interpretive theory of culture" in *The interpretation of cultures: Selected essays*. New York, NY: Basic Books. 3–30.

Hallowell, M. R., and Gambatese, J. A. (2010). Qualitative research: application of the Delphi method to CEM research. *J. Constr. Eng. Manag.* 136, 99–107. doi: 10.1061/(ASCE)CO.1943-7862.0000137

Harrison, R. (1972). "Understanding Your Organization's Character" in Harvard Business Review (May–June). 119–128. Available at: http://www.uulead.org/docs/orgcharacter.pdf

Heiko, A. (2012). Consensus measurement in Delphi studies: review and implications for future quality assurance. *Technol. Forecast. Soc. Change* 79, 1525–1536. doi: 10.1016/j.techfore.2012.04.013

Hemerling, J., Kilmann, J., Danoesastro, M., Stutts, L., and Ahern, C. (2018). *It's not a digital transformation without a digital culture* Boston Consult. Group, 1–11.

Hung, H.-L., Altschuld, J. W., and Lee, Y.-F. (2008). Methodological and conceptual issues confronting a cross-country Delphi study of educational program evaluation. *Eval. Program Plann.* 31, 191–198. doi: 10.1016/j.evalprogplan.2008.02.005

ITD (2021). Índice de Transformación Digital de Empresas. Available at: http://wapp4.corfo.cl/archivos/WCSCONTI/DOCS/21102021ResultadosITD2021.pdf

Janowski, T. (2015). Digital government evolution: from transformation to contextualization. *Gov. Inf. Q.* 32, 221–236. doi: 10.1016/j.giq.2015.07.001

Jovanović, M., Dlačić, J., and Okanović, M. (2018). Digitalization and society's sustainable development–measures and implications. *Zb. Rad. Ekon. Fak. U Rijeci Časopis Za Ekon Teor. Praksu* 36, 905–928. doi: 10.18045/zbefri.2018.2.905

Kane, G. C., Palmer, D., and Phillips, A. N. (2017). *Achieving digital maturity*. Boston, MA: MIT Sloan Management Review and Deloitte University Press.

Kane, G. C., Palmer, D., Phillips, A. N., Kiron, D., and Buckley, N. (2015) Strategy, not technology, drives digital transformation. Available at: http://sloanreview.mit.edu/projects/strategy-not-technology-drives-digital-transformation

Kanter, R. M. (2001). *Evolve! Succeeding in the digital culture of tomorrow* Harvard Business School Press.

Kermanshachi, S., Rouhanizadeh, B., and Dao, B. (2020). Application of Delphi method in identifying, ranking, and weighting project complexity indicators for construction projects. *J. Leg. Aff. Disput. Resolut. Eng. Constr.* 12:04519033. doi: 10.1061/(ASCE)LA.1943-4170.0000338

Kerpedzhiev, G. D., König, U. M., Röglinger, M., and Rosemann, M. (2021). An exploration into future business process management capabilities in view of digitalization: results from a Delphi study. *Bus. Inf. Syst. Eng.* 63, 83–96. doi: 10.1007/s12599-020-00637-0

Kohnke, O. (2017). "It's not just about technology: The people side of digitization" in *Shaping the Digital Enterprise*. eds. G. Oswald and M. Kleinemeier (Cham: Springer).

Landeta, J. (1999). *El método Delphi: una técnica de previsión para la incertidumbre*. Barcelona: Ariel Publisher.

Lipovetsky, G. (2020). *Gustar y emocionar. Ensayo sobre la sociedad de la seducción*. Barcelona: Anagrama

Loebbecke, C., and Picot, A. (2015). Reflections on societal and business model transformation arising from digitization and big data analytics: a research agenda. *J. Strateg. Inf. Syst.* 24, 149–157. doi: 10.1016/j.jsis.2015.08.002

López Gómez, E. (2018). El método Delphi en la investigación actual en educación: una revisión teórica y metodológica. *Educ. XX1 Rev. Fac. Educ.* 21, 17–40. doi: 10.5944/educxx1.20169

Lucas, H. C. Jr., and Goh, J. M. (2009). Disruptive technology: how Kodak missed the digital photography revolution. *J. Strateg. Inf. Syst.* 18, 46–55. doi: 10.1016/j.jsis.2009.01.002

Ludwig, B. (1997). Predicting the future: have you considered using the Delphi methodology? *J. Ext.* 35, 1–4.

Luhmann, N. (2007). *La sociedad de la sociedad*. México: Herder.

Luhmann, N. (2010) *Organización y decisión*. México: Herder

Maturana, H., and Varela, F. (1984). *El árbol del conocimiento*. Santiago, Chile: Editorial Universitaria.

Mintzberg, H. (1980). Structure in 5's: a synthesis of the research on organization design. *Manag. Sci.* 26, 322–341. doi: 10.1287/mnsc.26.3.322

Mirković, V., Lukić, J., Lazarević, S., and Vojinović, Ž. (2019). "Key characteristics of organizational structure that supports digital transformation" in *In 24th International Scientific Symposium on Strategic Management and Decision Support Systems in Strategic Management Subotica*. Republic of Serbia.

Morakanyane, R., Grace, A. A., and O'reilly, P. (2017). Conceptualizing digital transformation in business organizations: A Systematic review of literature. *In 30TH Bled eConference: digital transformation – From connecting things to transforming our lives (June 18–21, 2017, Bled, Slovenia)*. 427–444. doi: 10.18690/978-961-286-043-1

Naji, K. K., Gunduz, M., and Naser, A. F. (2022). Construction change order management project support system utilizing Delphi method. *J Civil Engineering and Management* 28, 564–589.

Nasa, P., Azoulay, E., Khanna, A. K., Jain, R., Gupta, S., Javeri, Y., et al. (2021). Expert consensus statements for the management of COVID-19-related acute respiratory failure using a Delphi method. *Critical Care* 25, 1–17.

Needham, R. D., and de Loë, R. C. (1990). The policy Delphi: purpose, structure, and application. *Can. Geogr. Géographe Can.* 34, 133–142. doi: 10.1111/j.1541-0064.1990.tb01258.x

OCDE (2010). Structural and Demographic Business Statistics 2009. *Paris: OECD Publishing*. doi: 10.1787/9789264072886-en

Ochoa, O. L. (2016). Modelos de madurez digital:¿ en qué consisten y qué podemos aprender de ellos?/digital maturity models: what are they and what can we learn from them? *Bol. Estud. Económicos* 71:573.

Powell, C. (2003). The Delphi technique: myths and realities. *J. Adv. Nurs.* 41, 376–382. doi: 10.1046/j.1365-2648.2003.02537.x

Rachinger, M., Rauter, R., Müller, C., Vorraber, W., and Schirgi, E. (2018). Digitalization and its influence on business model innovation. *J. Manuf. Technol. Manag.* 30, 1143–1160. doi: 10.1108/JMTM-01-2018-0020

Reguant Álvarez, M., and Torrado Fonseca, M. (2016). El método delphi. *REIRE Rev. Innovació Recer. En Educ* 9, 87–102. doi: 10.1344/reire2016.9.1916

Remane, G., Hanelt, A., Nickerson, R. C., and Kolbe, L. M. (2017). Discovering digital business models in traditional industries. *J. Bus. Strategy*

Roblek, V., Meško, M., Pušavec, F., and Likar, B. (2021). The role and meaning of the digital transformation as a disruptive innovation on small and medium manufacturing enterprises. *Front. Psychol.* 12:592528. doi: 10.3389/fpsyg.2021.592528

Rodríguez, D. (2011). Gestión organizacional. Ediciones UC. Gestión organizacional. Ediciones UC, Santiago de Chile.

Schein, E. H. (1990). Organizational culture. *Am. Psychol.* 45, 109–119. doi: 10.1037/0003-066X.45.2.109

Schmidt, R. C. (1997). Managing Delphi surveys using nonparametric statistical techniques. *Decis. Sci.* 28, 763–774. doi: 10.1111/j.1540-5915.1997.tb01330.x

Teichert, R. (2019). Digital transformation maturity: A systematic review of literature. *Acta Univ. Agric. Silvic. Mendel. Brun* 67, 1673–1687. doi: 10.11118/actaun201967061673

Trushkina, N., Abazov, R., Rynkevych, N., and Bakhautdinova, G. (2020). Digital transformation of organizational culture under conditions of the information economy. *Virtual Econ.* 3, 7–38. doi: 10.34021/ve.2020.03.01(1)

Vax, S., Farkas, M., Russinova, Z., Mueser, K. T., and Drainoni, M. L. (2021). Enhancing organizational readiness for implementation: constructing a typology of readiness-development strategies using a modified Delphi process. *Implement. Sci.* 16:61. doi: 10.1186/s13012-021-01132-0

Villaplana, F., and Stein, G. (2019). *Tres claves para afrontar la transformación digital: organización, desempeño y gestión de datos*. IESE Business School-University of Navarra. 1–20.

Wang, L. (2016). The new trend and application of customer relationship management under big data background. *Mod. Econ.* 07, 841–848. doi: 10.4236/me.2016.78087

Weill, P., and Woerner, S. L. (2018). Is your company ready for a digital future? *MIT Sloan Manag Rev.* 59, 21–25.

Westerman, G., Soule, D. L., and Eswaran, A. (2019). Building digital-ready culture in traditional organizations. *MIT Sloan Manag. Rev.* 60, 59–68. Available at: https://sloanreview.mit.edu/article/building-digital-ready-culture-in-traditional-organizations/

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Gender and organizational culture in the European Union: situation and prospects

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In recent decades, there has been a massive incorporation of women into the labor market. However, the belief that certain jobs or business functions can be performed better by people of one gender than the other has not allowed for widespread changes in the business culture to achieve effective equality between women and men in companies. Examples of this are unequal access to employment, vertical and horizontal segregation in occupations, wage discrimination, problems in reconciling personal and professional life, or difficulties in accessing management positions in companies (glass ceiling). Other determinants of gender inequalities have been long working hours, as well as the presence of employees, characteristic of European business culture. The progress achieved to date began with the incorporation of women into the labor market under unequal conditions that soon called for the need to establish a regulatory framework to try to eradicate them. The legal status of women in Europe has undoubtedly improved as a result of the development of European regulations, which have been binding in the development of business policies in the Member States and have succeeded in modifying the organizational climate through proposals such as the development of Equality Plans or salary audits. Examples of the most recent legislative initiatives of the European Union on equality that affect business practices are Directive 2022/2041/EC on adequate minimum wages in the European Union or Directive 2022/2381/EC on a better gender balance among directors of listed companies. This study attempts to systematize the changes in the legislation on effective equality between men and women in business and to analyze its effect on organizational culture through the information available in the statistics on gender equality—mainly from the European Union—which gather quantitative and qualitative information on the adaptation of business culture to the new legal framework and the overcoming of gender stereotypes that have been guiding business management in the last decade.

KEYWORDS

gender equality, organizational culture, glass ceiling, gender parity on boards, European Union law

1. Introduction

Generally, studies that attempt to analyze the degree of effective equality between men and women in the economy focus on macroeconomic aspects such as the multiple gender gaps in the labor markets or the public policies and legal measures that would be necessary to reduce these differences between men and women. By contrast, in many cases, these inquiries fail to consider the psychological and social conditioning factors that trigger those conducts within companies which can only be overcome with a firm commitment to change in the corporate culture.

It is interesting to note how within each company, there are replicas of complex, dynamic societies, composed of diverse subjects that follow several ethical principles, marking the role of each member that is part of them. Thus, how personal and interpersonal relationships are developed will affect their business success. Organizational culture is responsible for analyzing what are the opinions, norms, and values that are spread within companies, and how they condition the behavior of the staff (Bayón Pérez, 2019). Remarkably, however, in business terms, climate refers to the perception that a company's employees have of its corporate culture. Following (María Jesús, 2016), this notion is defined as "the perception of people, regarding the work context in which they carry out their work, at a given moment in time[...], something that can be managed over time by knowing and activating the levers of improvement of those aspects of working life that most influence attitudes of satisfaction and commitment at work." By contrast, (Cisneros and La Torre, 2004) consider that "organizational culture should comply with, among other functions, making organizations different, generating a sense of identity, orienting behaviors toward institutional goals, facilitating the company's adaptation to the environment, to learning, to change, and maintaining the internal social system stable."

Based on a specific culture, the concept of business climate arises from the need to connect the part of purely corporate values and social relations within companies. Therefore, public policies must encourage the highest levels of the business organization to establish those ethical values and equity essential to achieve equality between women and men in terms of employment conditions, salaries, and professional careers. As part of organizations, people's careers are as important as their personal development. In this sense, workers should know in advance what values underpin the companies where they will spend their time and knowledge over a long period of their lives. Chiavenato (2011) highlights that "to know an organization, the first step is to know its culture since being part of it means assimilating it. To live in an organization, to work in it, to take part in its activities and to make a career is to participate intimately in its culture."

Considering all this, the aim of this article is 2-fold: first, to analyze the different regulatory measures implemented by the European Union (hereinafter EU) and national legislations in the last decades, to promote the incorporation of women into the business world, and to reduce the gaps in employment, salaries, and professional careers. Within this first objective, this article will also try to evaluate the measures' effectiveness based on the following hypothesis: The legal measures established to reduce male hegemony at the highest levels of business management have been effective and may be a driving force for both changing the business culture in terms of gender equality and removing stereotypes about the managerial capacity of women and men. Second, this study will also examine the progress made in the business environment by establishing the current situation in terms of equality between men and women in business in EU countries. It is evident that in recent decades, there has been a massive incorporation of women into the labor market, thus becoming affected stakeholders by everything that has happened in companies. Thus, it is necessary to know what role women play in labor relations, whether they are in an equal position to men, or whether, on the contrary, women find a climate of discrimination in their jobs, which translates into negative results for the whole set of corporate policies. In this article, therefore, it will be shown that by analyzing the position of women in the organizational culture, the dominant culture in companies has been male. Hence, individuals occupy a system that organizes power relations through a relationship of inequality between men and women (Reverter Bañón, 2008), and the business world is no exception to this reality.

2. Corporate culture and gender equality

After making an exhaustive selection of the existing academic literature on corporate culture and gender equality, the notion of Social Gender Responsibility (hereinafter SRG) begins to gain a place as it should be deployed to address all the problems that women face in the labor market. Following the state of the earlier question, it is widely known that there is ample theorization of the importance of business culture and ethics in the fight against gender inequalities. Nonetheless, this study will show that the databases and statistics that can support the models proposed and suggest new future practices are practically scarce.

The establishment of gender equality in organizations has long been demanded to be a principal objective of social responsibility actions. Corporate Social Responsibility (hereinafter CSR) can be defined as a form of business management that focuses on considering the impact of its activity on both society and the environment. Yet, some scholars (see Larrieta et al., 2014) claim the necessity of building an SRG system within companies where activities should include a gender perspective, either if these are internal to the company, such as human resource management, occupational health and safety, adaptation to change, and management of environmental impact and natural resources, or external, such as local communities, business partners, suppliers and consumers, human rights, and global ecological issues (Larrieta et al., 2014).

However, women's insertion in new public spaces, such as the workplace, has not exempted them from reproducing the gender patterns imposed (Martínez Méndez, 2018). That is why gender equality should form an essential part of corporate culture even if evidence has shown that in most cases, legislative tools are needed to force companies to adapt their corporate values and intensify their strategies against gender discrimination. Many authors agree on signaling a direct relationship between CSR and the notion of gender mainstreaming. Particularly, they emphasize that if CSR deals with analyzing the links with interest groups such as stakeholders, it consistently needs to be concerned with gender impact. Historically, women have been overlooked in the process of considering these stakeholders (Pearson and Seyfang, 2002). Nonetheless, given the integral part played by workers within these agents, the establishment of systems that respect them is widely needed. Cogently, this can only be executed by eradicating the gender discrimination that still prevails in companies' important issues such as remuneration, family life reconciliation, and women's access possibilities to management positions. As González González (2021) signals, while the culture of a company cannot be

legally regulated, social responsibility, ethics, and the requirements of stakeholders may influence the company to comply with certain objectives beyond legal obligations. Thus, it is necessary to identify how companies accept gender equality regulations in the achievement of their business objectives, specifically in soft laws. In this respect, gender-inclusive leadership may provide different perspectives on equity, generate a higher level of philanthropic activities, and affect the quality of CSR initiatives to ultimately allow companies to achieve a great degree of success (Soares et al., 2011).

Historically, the current proposals for equality within CSR may have been aimed at complying exclusively with the "minimum share." That is, they promote the balanced presence of men and women on the boards of directors of large organizations. By contrast, although this is relevant, it is not unique since they need to consider the rest of the perspectives that range from internal dimensions, where the aspects directly related to business management are situated, to external ones, which directly relate to other aspects such as sustainable development and human rights (Boldó Roda, 2015).

Many authors argue that the strategies of organizations should consider gender equality and take concrete actions in this area. In this sense, promoting equal opportunities in the organization needs to be a leading strategic objective (Bastida, 2009). One of the main hypotheses is to question the current economic model as its goal is still to maximize the wealth of corporate stakeholders while increasing economic and financial probability. Nonetheless, organizations also need to be a driving force for the economic and personal development of the individuals that integrate them (Rumí et al., 2016). Interestingly, different European countries began to foreground the importance of CSR in terms of gender equality and equal opportunities after the Lisbon Treaty (European Economic Community 2007). This resulted in the development of the Green Paper, also known as "Promoting a European Framework for Corporate Social Responsibility" (Commission of the European Communities, 2011). In this publication, the notion of Corporate Social Responsibility and some of its main characteristics are included:

"CSR is a voluntary integration, from the part of the companies, of social and environmental concerns into their business operations and their relationship with stakeholders—Being socially responsible does not only involve fully complying with legal obligations, but also going beyond by investing 'more' in human capital, the environment, and stakeholder relations." Furthermore, it also highlights how those companies that pay attention to social aspects, such as gender equality, can improve their results and generate greater economic growth. CSR, therefore, "is not simply an optional aspect that should be added to the company's main activities but rather an element that may affect its own management." Vacca et al. (2020) indicate that participation in CSR practices proves to be a fundamental factor in a company's survival and success. CSR represents a company's commitment to contribute to economic development and improve social and environmental standards within the European Union and internationally.

Returning to the model based on the maximization of corporate profit, many studies have tried to modify the widely acknowledged business ethics. The business world has long been masculinized, so it is necessary to reflect on how business ethics can help to achieve gender equality in organizations. As the branch of ethics has been established as a discipline that conglomerates the "should-be" dimension, the demands on gender equality should transcend the conditionality to become a formal reality within a business. Cortina Orts (2003) argues that "ethics is broader in scope than law. Law is about avoiding deviant behavior [...] but ethics is about ethos and incorporating into the character of individuals and organizations those habits that can lead to fair decisions." Considering back the notion of GSR (Kahale Carrillo, 2013), it entails the incorporation of the issue of gender into CSR management to reinterpret the existent relationship between companies and stakeholders through a gender lens. Therefore, GSR is based on a business ethic that is sensitive to the problem of gender discrimination which attempts to address current issues faced by women in the labor market ranging from the sexual division of labor and gender wage gaps to sexual harassment in the workplace. In this way, gender equality becomes one more value of the corporate culture, for it turns into a central part of business management and any work dynamics adopted.

For over three decades now, corporate managers are constantly looking for ways to balance their commitments to the owners of the company and their obligations with the growing group of stakeholders who are constantly claiming both legal and ethical rights (Carroll, 1991). The founder of the pyramid theory, who set out four types of companies' social responsibilities with a pyramid structure, indicated that "social responsibility would only become a reality if a growing number of adults become moral rather than amoral or immoral." Grosser and Moon (2005) holds that the scope and subsequent application of a correct CSR need to combine the technical processes for measuring and reporting social results with political processes to redefine corporate rights and responsibilities, always considering the different forms of stakeholders' participation.

Business ethics would thus become the perfect tool to provide a universal framework for reflection, regardless of territory and different legal frameworks, which works to solve the conflicts that may arise and suggest good actions beyond legal schemes (Medina-Vicent, 2016). Similarly, the scholar also advocates the need of complementing law with ethics to move toward truly egalitarian societies (Medina-Vicent, 2015).

Although company owners attract a wider interest since they are responsible for taking decisions, research also focuses on identifying what groups of stakeholders can demand gender equality and the consequences of a balanced number of men and women in a company's economic power. As cited by Solimene et al. (2017), diversity on the shareholder board produces positive effects due to different knowledge, skills, experiences, ideas, and behaviors; thus, a heterogeneous board can better meet the requirements of the company's stakeholders. While some instances may not reflect the positive effects that gender equality could have on business results and the regulations do not sanction companies, one compelling case would be to receive pressure from the part of stakeholders to make organizations include concrete actions within their strategic objectives. de Luis Carnicer et al. (2011) allude to several scholars that advocate a current trend in business management that centers on increasing the benefit for the whole society. In this way, this new management considers an equal distribution of benefits and

opportunities for all the groups involved in the activities of a company. Furthermore, they point out that even though women should not be considered as stakeholders since they make up 50% of the population, they will form part of all possible agents affected by companies, such as workers, suppliers, customers, managers, and owners, and it is necessary to acknowledge that their inferiority within stakeholders is highly visible. If companies wish to maintain their position in society, then, it will be necessary to move from strategic business management to one based on active listening to their environment, while maintaining reciprocal relationships with their stakeholders. The theory of stakeholders (Freeman, 1984) highlights that ethics and morality should play an active role in the business world and, particularly, in the achievement of gender equality. Freeman claims that managers should make corporate decisions by respecting the welfare of stakeholders rather than using them to achieve a corporate end. In this respect, the scholar claims that companies should advocate for equal opportunities that allow female employees to have the same conditions as their male counterparts. Thus, any action that promotes inequality between women and men within the corporate structure would not be legitimate. Departing from this ethical model which promotes a reciprocal relationship between business organization and stakeholders, the foundational basis for the integration of a gender perspective within a company is established.

In conclusion, it is necessary to consider Amelia Valcárcel's observation that behind the individuals who will be part of a board of directors or business management, there is an underlying ideology that overlooks the candidate's experience, training, and credentials. Cogently, this perpetuates gender stereotypes to place the capabilities of men in leadership positions (Valcárcel, 2007). Taking this into account, the necessity of implementing legal measures that force organizations to balance the power rather than locate it in the hands of those who, despite not having the necessary skills, comply with the biological identity held as superior.

3. Methodology

This article uses a mixed-method approach since it examines quantitative and qualitative information regarding women's situation in companies and is different from the 27 EU Member States according to their current configuration. It has been emphasized that one of this study's objectives is to explore the relationship between existing regulations on gender equality in the workplace and the development of corporate culture. This would help to evaluate whether situations of discrimination against women take place in the climate in which people work. Furthermore, the target is also to verify whether legislative advances have improved the situation in recent decades by urging companies to develop new organizational culture practices that promote equality between women and men at all workplace levels. In this way, the analysis developed in this article has a temporal dimension which started in the last 30 years with the IV Conference on Women (United Nations, 1995) and is considered an important turning point in this area.

First, a legal analysis will be made by reviewing the progress made in recent years in terms of gender equality and the labor market. This scrutiny would help to both analyze and comprehend the explanatory memorandum of any legislative proposal and to evaluate the repercussions and effectiveness of the law. Specifically, this study will be focused on two main aspects: First, the inspection of the main international and community texts that highlight both the discrimination suffered by women in the labor market and the importance of scheduling gender equality as a main objective for sustainable economic development; second, the enumeration of the different European Directives which has given significant advances to gender equality in the business environment. The primary source has been the EUR-Lex platform (Publications Office of the European Union, 2022), which gathered all EU legislative texts, grouped them, and updated them at different stages of the legislative process. In this section, the regulatory impact of the countries that have implemented laws on gender parity on boards of directors has been considered to determine whether they have encouraged the promotion of women to the highest levels of business and decision-making.

This will be followed by an analysis of the information available from different statistical sources in the EU. Particularly, this examination would be useful to obtain a diagnosis of the current situation, its evolution, and evidence of the effectiveness of the legal measures implemented. It is important to emphasize that these issues have not been the current priority of the legislative and political agendas of the Member States. Consequently, there are no *ad hoc* European statistics on business culture or climate from a gender perspective.[1] That is why a selection of relevant information from different statistics was developed to help make an approximation in three stages:

The first stage corresponds to the analysis of all the variables that show the changes in the incorporation and quality of women's employment in the national labor markets. Specifically, this scrutiny has been carried out through data collected in the Labor Force Survey (hereafter LFS) (European Statistical Office, Eurostat 2022), a sample survey that collects quarterly and annual data over a wide period with the participation of people over the age of 15 and people outside the labor force.

The second stage will investigate the variables related to the professional development of women, especially in their access to management positions, whether middle management or executive. As this information is not available in the LFS, the analysis has been carried out through the European Working Conditions Survey (hereinafter EWCS) and the Gender Equality Index of EIGE.

The final stage will develop an in-depth analysis of qualitative indicators and opinion surveys. This examination would show the maintenance of gender stereotypes as well as other elements of corporate culture through the thoughts of employees in their jobs. In this case, the information has been obtained both from the EWCS and from specific surveys prepared by Eurobarometer.[2]

1 The European Enterprise Survey (ECS) has been carried out regularly since its inception in 2004–2005 as the European Establishment Survey on Working Time and Work-Life Balance (ESWT), but, unfortunately, none of the items of the survey applies to our analysis.

2 "Eurobarometer is the polling instrument used by the European Commission, the European Parliament, and other EU institutions and agencies to regularly monitor the state of public opinion in Europe on issues

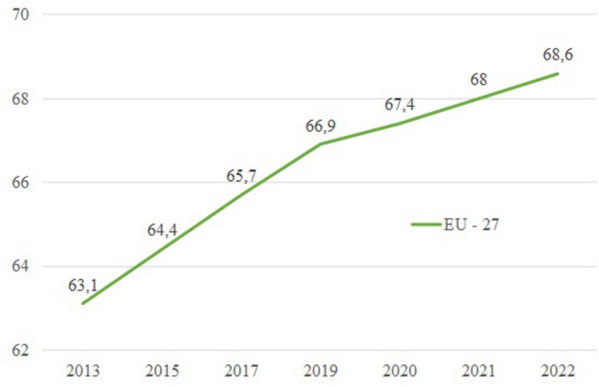

FIGURE 1
Gender equality index EU-27. Source: Own elaboration based on data from Gender Equality Index, EIGE[3].

4. Regulatory review

4.1. Current EU regulations affecting the labor force

Before offering an overview of the gender equality EU regulations, it is necessary to define its current situation. For this purpose, the Gender Equality Index of the past 10 years developed by the European Institute for Gender Equality (hereafter EIGE) would be used. This index is a measurement tool that synthesizes the complexity of gender equality by looking at its multiple dimensions with six core domains: work, money, knowledge, time, power, and health; particularly, this tool measures the progress of gender equality in the EU, makes visible those areas in need of improvement, and assists policymakers in designing more effective gender equality measures. Figure 1, for instance, depicts how progress in gender equality has been slow due to decision-making improvements as it will be subsequently analyzed in-depth.

In 2013, the index stood at 63.10 points, and as the graph shows, approximately a decade later, it has only increased by less than 5 points. Considering that the index gives a score from 1 to 100 to the Member States, in which 100 would imply the achievement of full equality for men and women, the index backs up the argument that there is still work to do. Some studies confirm that with the current EIGE data, it will take almost three generations to achieve gender equality. Interestingly, if the 68.80 points corresponding to 2022 are itemized, it can be seen how the domain of power is the one with the lowest score, at 57.20 points. This domain directly refers to gender equality both in the political sphere and in companies' decision-making bodies which results from organizational culture.

A detailed analysis of this index by country is shown in Figure 2, which reveals that the 16 Member States are below the EU average while the remaining 11 grew faster in gender equality, thus reducing their distance from the EU average. In this respect, the countries' central domain of power suggests that there is still a latent gender imbalance in large companies' decision-making processes. Nonetheless, the proportion of women on board in some of the EU's largest listed companies reached a historic high of 32% in April 2022 due to changes in countries with binding legislation.

Another key indicator of the situation of women in the labor market is the Global Gender Gap Report (World Economic Forum, 2022). This document, respectively, compares the status and the evolution of gender parity in four key categories: economic participation and opportunity, educational attainment, health and survival, and political empowerment. According to the 2022 latest report, we will need around 132 years to reach complete gender parity. Of the four sub-indexes that compose the report, we developed an in-depth exploration of the gender gap in leadership by industry section. Interestingly, the analysis shows that the percentage of women hired in leadership roles has steadily increased from 33.3% in 2016 to 36.9% in 2022. Nonetheless, while the rate of women in leadership has escalated over time, women have not been recruited equally in all industries. On average, more women have been hired for leadership positions in industries where they already have a high representation. Remarkably, however, only specific industries, such as non-governmental organizations (47%), education (46%), and personal services and welfare (45%), have levels close to gender parity in leadership. Directly opposing these rates are industries such as energy (20%), manufacturing (19%), and infrastructure (16%).

Taking all these into consideration, it could be argued that the data presented are not coincidental since they illustrate that women still suffer inequality in many areas, in particular, the data reflect that the largely proclaimed equality between men and women is still an unattained goal, which, as we will show, is more prevalent in legal texts than in the wider society. This reflection in legal and gender terms illuminates that, despite the social acceptance of the rules and the involvement of public authorities in achieving equality, some important aspects that regulate these laws are not fully effective. This is because its breach only generates a series of social or academic criticisms, but not a real sanction.

Over the past three decades, the European Commission (hereinafter EC) and the Council (from now on EUCO) have generated some plans, measures, and directives to favor equality between men and women in business for all Member States. Nonetheless, one of the weaknesses that have been found in this regulatory framework is that the laws fail to explain how they can be correctly implemented and binding for all Member States. As it will be shown, the EU, the United Nations, organizations, and political groups have implemented certain actions to increase the participation of women in business decision-making. While this has produced certain improvements in some countries, particularly those with privileged economic and educational development, they are not enough.

Still, the measures proposed at the legal level are dependent on the willingness and ethics of those who are in charge of putting them into action. Medina-Vicent (2016) highlights that one of the problems in the effective implementation of gender

related to the European Union as well as attitudes on subjects of political or social nature. Eurobarometer provides quality and relevant data for experts in public opinion, researchers, media, and the public."

3 https://eige.europa.eu/gender-equality-index

FIGURE 2
Gender equality index by countries, 2022. Source: Own elaboration based on data from Gender Equality Index, EIGE.

equality in companies may lie in the fact that the gender issue has been incorporated into European regulations not from the search for equality as a basic human value but from a purely economic necessity. In this way, the commission may have been requiring companies to exploit the expertise of women not as a way of promoting social justice but rather as an objective to attain European economic efficiency.

An important turning point in the achievement of gender equality was the IV Conference on Women (United Nations, 1995). However, before delving into the main advances of this declaration, which is an international precedent since it included the concept of gender discrimination for the first time, some important elements need to be foregrounded. For instance, the ILO convention no. 11 (International Labour Organization, 1958) concerning Discrimination in Respect of Employment and Occupation, and the Convention on the Elimination of All Forms of Discrimination against Women (United Nations General Assembly, 1981), where the importance of the Charter of the United Nations (United, 1945) is exposed. From the former, it is interesting to consider article 11.1: "States Parties shall take all appropriate measures to eliminate discrimination against women in the field of employment in order to ensure, on a basis of equality of men and women, the same rights, in particular [...] (b) The right to the same employment opportunities, including the application of the same criteria for selection in matters of employment; (c) The right to free choice of profession and employment, the right to promotion, job security and all benefits and conditions of service and the right to receive vocational training and retraining, including apprenticeships, advanced vocational training and recurrent training; (d) The right to equal remuneration, including benefits, and to equal treatment in respect of work of equal value, as well as equality of treatment in the evaluation of the quality of work; (e) The right to social security, particularly in cases of retirement, unemployment, sickness, invalidity and old age and other incapacity to work, as well as the right to paid leave; [...]" Following the chronological order of this text, it is also necessary to mention the proposal of the United Nations Commission on the Status of Women. This was the main international body devoted to fostering gender equality and women's empowerment. In 1987, this regulatory body developed a work program following the guidelines held by the III Conference on Women (United Nations, 1985). These codes established several priority areas, which include the promotion of equality in both economic and social participation and decision-making.

A conference that stands out from previous World Conferences is the Beijing Declaration (United Nations, 1995), particularly it was important since this conference introduced the novel concept of gender mainstreaming. This notion serves to indicate the need to incorporate a gender perspective in all policies and programs so that before a decision is taken, the effects on women and men are, respectively, analyzed. Most important, perhaps, is that the report of this conference was unanimously adopted by 189 countries, and thus established certain strategic objectives in favor of women's empowerment.

For this article, chapter F: Women and the Economy has been explored in-depth. This chapter reflects how the absent presence of women in economic decisions affects not only their

public realm but also their private one. In this way, the entire society is completely disturbed by the unequal economic structure between men and women. As such, it formulates certain objectives which should be attained by national governments which would be responsible for: establishing actions such as guaranteeing women's equal pay rights with men (equal pay for equal work or work of equal value), effectively enforcing laws against sex discrimination in the labor market, adopting measures that protect women's biological status in terms of reproductive function, such as not hiring or firing women because of pregnancy or breastfeeding, developing positive measures to enable women to participate on equal terms, reviewing national tax systems to eliminate any possible discrimination against women, continuing to work on measuring unpaid work, and modifying employment policies to make it possible to share family responsibilities, among many others.

The year 1999 saw the coming into force of the Treaty of Amsterdam (European Economic Community, 1997) which is relevant for the establishment of equality between men and women in the EU, particularly in the labor market. One of the most important articles in this respect is Article 141 which includes the establishment of work for equal value and the possibility of adopting positive discrimination measures. Article 141.1: "Each Member State shall ensure that the principle of equal pay for male and female workers for equal work or work of equal value is applied." 2- "For the purpose of this Article, 'pay' means the ordinary basic or minimum wage or salary and any other consideration, whether in cash or in kind, which the worker receives directly or indirectly, in respect of his employment, from his employer. Equal pay without discrimination based on sex means: (a) that pay for the same work at piece rates shall be calculated based on the same unit of measurement; (b) that pay for work at time rates shall be the same for the same job. 3- The Council, acting in accordance with the procedure referred to in Article 251, and after consulting the Economic and Social Committee, shall adopt measures to ensure the application of the principle of equal opportunities and equal treatment of men and women in matters of employment and occupation, including the principle of equal pay for equal work or work of equal value. 4- With a view to ensuring full equality in practice between men and women in working life, the principle of equal treatment shall not prevent any Member State from maintaining or adopting measures providing for specific advantages in order to make it easier for the underrepresented sex to pursue a vocational activity or to prevent or compensate for disadvantages in professional careers." The interest in this article derives from the fact that it heavily influenced the subsequent development of Community Directives (hereinafter Dir.). That is, the Treaty of Amsterdam laid the foundations so that the EU could develop several measures to strengthen the binding and enforceability of the Member States' national law; particularly, our analysis centers around those affecting the labor market, and, for this purpose, we established five categories indicated in Table 1 that were subsequently compared with the statistics of the counties in which these measures have been materialized to effectively promote equality:

Interestingly, the elaboration of these legal texts has evolved. For instance, the Dir.2000/78/EC on the establishment of a general framework for equal treatment in employment and occupation failed to mention the category of sex as discriminatory. Even so, it laid a foundation that could be applied equally to the unequal treatment of women in the workplace. Similarly, the text also includes a definition of the concepts of direct and indirect discrimination, which are key in the fight against gender inequality among women workers.

TABLE 1 European legislation on equality.

Category	Legislation
Incorporation of women into the labor market.	→ Dir.2000/78/EC, on the establishment of a general framework for equal treatment in employment and occupation. → Dir.2006/54/EC, on the implementation of the principle of equal opportunities and equal treatment of men and women in matters of employment and occupation. → Regulation. (EC) no. 1922/2006 on establishing a European Institute for Gender Equality.
Type of workday.	→ Dir.97/81/EC, on the Framework Agreement on part-time work. → Dir.2008/104/EC, on temporary agency work.
Equal pay.	→ Dir.2019/1152/EU, on transparent and predictable working conditions in the European Union. → Dir. 2022/2041/EU, on adequate minimum wages in the European Union. → Action Plan EU 2017–2019 tackling the gender pay gap between men and women.
Work-life balance/parental leave.	→ Dir.92/85/EEC on the introduction of measures to encourage improvements in the safety and health at work of pregnant workers and workers who have recently given birth or are breastfeeding. → Dir.2010/41/EU on the application of the principle of equal treatment between men and women engaged in an activity in a self-employed capacity. → Dir.2019/1158 EU on work-life balance for parents and carers.
Professional development/economic power.	→ Council Recommendation 96/694 on the balanced participation of women and men in the decision-making process. → Dir.2022/2381/EU, on improving the gender balance among directors of listed companies and related measures.

Source: Own elaboration based on legal texts included in EUR-Lex.

Regarding Dir. 2006/54/EC on the implementation of the principle of equal opportunities and equal treatment of men and women in matters of employment and occupation, it should be noted that it established major amendments to other texts that were previously approved (Council Dir. 76/207/EEC of 9 February 1976 and Council Dir. 86/378/EEC of 24 July 1986). The reason behind the amendments was 2-fold: (1) to conflate in a single text the main aspects and provisions relating to equal treatment between men and women in the labor market; and (2) to include new developments arising from the case law of the European Court of Justice. In this text, the Council states that it is important to thoroughly specify what society understands by "work for equal value," a crucial element for the study of the gender pay gap. However, when the directive is analyzed in-depth, it is not farfetched to suggest that

the discrimination suffered by women in terms of pay and working conditions largely comes from the lack of work–life balance. That is why the 2006/54/EC is committed to the implementation of positive action measures, and in its last considerations, it states the need to create effective sanctions to comply with equal treatment between men and women: 35) "Member States should provide for effective, proportionate and dissuasive penalties for breaches of the obligations under this Directive."

It is also necessary to consider the Directives and Proposed Directives that have come into force in the last 3 years. The Dir.2019/1152/EU on transparent and predictable working conditions in the European Union points out that regardless of the type and duration of the employment relationship, workers are entitled to fair and equitable treatment in terms of working conditions.

The proposal for Dir.2021/0050 (COD), to strengthen the application of the principle of equal pay for equal work or work of equal value between men and women through pay transparency and enforcement mechanisms, is still in progress although the first reading took place in the council. In particular, the impulse behind this proposal lies in demanding that equal pay should be guaranteed in all Member States since the EU gender pay gap is currently approximately 14%, which would lead to a poorer quality of life for women in future. Although this requirement is already included in previous directives, it has not been met. Thus, the EU is in constant need to introduce new legal provisions that promote effective measures with which the States should comply.

The recent Dir.2022/2041/EU, on adequate minimum wages in the European Union, comes from a legislative procedure initiated in 2020. This procedure recognizes that women belong to a group that suffers multiple forms of discrimination, and therefore, they are more likely to be minimum or lower-paid workers than other groups. Given the lack of representation of women in low-paid jobs, the improvement of minimum wages would contribute to gender equality, in particular, reducing the gender and pension pay gap would bring women, and their families, out of poverty while promoting sustainable economic growth in the Union. Furthermore, it also emphasizes that the crisis caused by the COVID-19 pandemic has had a significant impact on the service and small business sector, which has a higher proportion of women as precarious wage earners.

Finally, it is also worthy of consideration that the Dir.2022/2381/EU improved the gender balance among directors of listed companies and related measures. This directive has been vetoed by Germany for 10 years, but still, the EC has been able to set the target that, by 2027, at least 40% of board members should be women. However, the aim of this directive is not only to increase the representation of women on boards of directors but also to help attract female talent to the company and ensure a greater presence of women at all levels of management and in the workforce.

4.2. Women on the boards of directors: the case of five member states

Although data suggest that approximately 60% of EU graduates are women, they are underrepresented in decision-making processes in the economic sphere in general and, particularly, in the business area. That is, Corporate Europe is still an area dominated by men since only 13% of senior management positions are held by women. This is because the boards of directors usually assert that this is the place where the most important economic decisions of a company should be made. Remarkably, however, one of the main characteristics of all the boards of directors in the Member States is also the lack of female representation. In this sense, it could be asserted that this prevalent absence of women in companies' management bodies remains one of the main unsolved gender gaps in the EU.

Still, it could not be assumed that these alarming data are something natural and inevitable. Very recently, legislative measures have been established to force companies to change this scenario of inequality. To date, one of the best tools developed has been the colloquially called quota system. This system has been adopted, in different forms, by only five states, but regardless of this fact, it has proven to be effective in terms of balancing the presence of men and women in economic power. Nonetheless, it has also shown that as the decision of its application does not impose a sanction in some countries such as Spain and the Netherlands, it is less effective in achieving quota targets in comparison to those states that apply sanctions for not complying with this balanced representation. Thus, it can be argued that the gender quota system is an effective measure to increase the presence of women on the boards of directors (Kirsch, 2021).

For this article, we have conducted an analysis of the characteristics and implementation of gender parity laws on boards of directors in five of the pioneering countries, namely Belgium, France, Spain, Italy, and the Netherlands. Thus, Table 2 shows the following data: the current situation of women on national boards of directors, the minimums established in the standard, whether in addition to these targets for the representation of each sex, there are other practices, such as recommendations in the Corporate Governance Codes (hereinafter CGC), and ultimately, the characteristics of these measures, specifically their duration, and whether they have penalized companies that have not complied with the target set.

Interestingly, the countries that initially established temporary measures have been extending the deadline as the expiration date was coming, even raising the minimum percentages to achieve. Regarding the applicable sanctions, the concept of the open seat is worthy of consideration. This notion refers to the fact that vacant positions on the board can only be filled by a person of the underrepresented sex, otherwise, the appointment will be null and void.

Gender balance in economic power is part of the Sustainable Development Goals of the 2030 Agenda (United Nations 2015) adopted by the United Nations, which aims to improve the quality of life of all people. Goal 5 called "Achieve gender equality and empower all women and girls" is the consequence of the fact that even though women have made significant progress in decision-making positions, their representation is still far from parity. Within the goals of this objective, we find the following in reference to our study: Goal 5.5 "Ensure women's full and effective participation and equal opportunities for leadership at all decision-making levels in political, economic, and public life," Goal

TABLE 2 Board parity legislation.

Country	% Women's participation in boards 2022-B1	Minimum % of women	CGC Recommendations	Duration	Sanction
Belgium	37.1%	33% applicable to executive and non-executive directors in state-owned and listed companies.	The 2009 CGC recommends that the composition of a board should be determined based on gender diversity.	Permanent	Open seat
France	46.3%	40% applicable to non-executive directors of large listed and unlisted companies.	Recommendation containing the same fees as in the 2011 Act, applicable to all board members (Amended in the 2020 revision by the requirements of the NFRD).	Permanent	Open seat
Spain	34.7%	40% applicable to both executive and non-executive directors in state-owned companies with 250 or more employees.	CGC Recommendation 15 on gender diversity. In the 2020 revision, a 40% quota is established.	Permanent	No incentives for companies that comply with it.
Italy	39.6%	40% for listed companies and state-owned enterprises. Applicable to management boards and supervisory boards.	The 2011 CGC includes reference to the gender composition of the board. In 2020, it is amended to specify what composition the board should have.	Temporary. In 2020 it was extended for six more offices.	Fines for companies that do not comply with the quota (from €100,000 to €1,000,000).
Netherland	39.5%	30% on the boards of directors and supervisory boards of large companies.	Diversity clauses in the 2009 Dutch CGC, applicable to both executives and non-executives. Voluntary charter with targets for more women in management.	Temporary. A new law was approved in 2021 (not yet in force)	Open seat

Source: Own elaboration based on EIGE data and national legal texts.

5.c "Adopt and strengthen sound policies and enforceable laws to promote gender equality and the empowerment of all women and girls at all levels."

Generally, the participation of women in companies has increased and minimum share proponents argue that diversity will be beneficial for improving equity and business efficiency. Yet, the positions of both top management and boards of directors remain almost an entirely male territory. Cultural norms regarding the prevailing gender roles in a society have a significant impact on the degree to which women are represented in a country's highest decision-making bodies (Holst and Kirsch, 2016).(Holst y Kirsch 2016).

5. Statistical analysis

The analysis of corporate culture in gender equality from a quantitative perspective is an intricate issue, particularly when it involves the examination of all the foundational values of corporate culture which try to provide a comprehensible path for all the people who compose the company and daily guidelines that maintain gender stereotypes. Thus, it is necessary to question to what extent this institutional framework perpetuates the belief that certain business functions are better performed by people of one gender than the other. Normally, these functions are ascribed to certain stereotypical values commonly attributed to the male gender, such as competitiveness, violence, fighting spirit, and leadership, which are considered the most suitable for the business environment.

The field of business has been an eminently masculine world in which the incorporation of women into the labor market, not only as employees but also as entrepreneurs, has been relatively recent. Consequently, this has produced a conflict of harmony between the traditional values of the business culture and the new reality of the presence of women in this field. This fact has ultimately led to the appearance of real barriers for women in this area such as unequal access to employment, wage discrimination, vertical and horizontal segregation in sectors and occupations, problems in reconciling personal and professional life, and obstacles to professional development.

As it has been said elsewhere, social, and legal advances to achieve effective equality between men and women in the EU countries prompted a significant reduction in the gaps in the labor markets. Nonetheless, to completely overcome this situation, corporate culture needs to be adapted to the new social situation by refuting the values based on gender stereotypes that currently characterize corporate management. Similarly, if organizations want to both increase and improve the employment rates of women in them, gender equity needs to be a crucial aspect of the culture and the identity of the organization (Marulanda et al., 2019).

The quantitative analysis of the business climate and other organizational elements is not simple, for it involves qualitative elements that are difficult to capture in observable variables. By contrast, at the European level, statistics on business culture that allow for analyzing and monitoring changes in organizations[4] are

4 The European Company Survey (ECS), conducted jointly by Eurofound and Cedefop in 2004, 2009, 2013, and 2019, provides information on workplace practices in terms of work organization, human resources

absent. Thus, examinations of these elements need to be carried out through gender equality labor statistics and opinion surveys.

The analysis of the evolution and current situation of the business climate and business culture in the EU that this article presents has been carried out in three stages which depend on two elements. In the former, they are largely contingent on the availability of qualitative information. In the latter, they are also determined by our analytical criteria on the range of quantitative and qualitative variables, time series, and cross-section, which will help to develop a thoroughly accurate diagnosis of the situation.

5.1. Situation of the labor market in the EU

To characterize the culture of EU[5] companies in terms of gender equality, it is first necessary to offer an overview of the incorporation of women into the labor markets and their socio-labor situation. Thus, Table 3 shows a synthesis of the most relevant variables with the widest period allowed by the time series available from Eurostat's Labour Force Survey (LFS). Although the data available started in 2005 and ended in 2021, initially, we thought that the year 2021 would be affected by the disruption in the series caused by COVID-19, but the analysis of the 2019 and 2020 data shows that the pandemic does not imply a disruption of the series in 2021. Considering this, we have extracted the following conclusions:

In terms of women's employment rates, in 2005, there were a significant number of EU countries with female employment rates below 50% or slightly above that figure. The case of Malta is particularly noteworthy, with a female employment rate of 33.4%, the lowest in the EU, and 37 points below the employment rate in Sweden, which was the country with the highest incorporation of women into the labor market. In addition, the average employment rate in the EU was 54.7% and the deviation of the countries from this average figure was very high, which shows the great heterogeneity of the labor markets at that time. Regarding the 2021 data, the number of countries with female employment rates close to or below 50% has fallen dramatically, the EU average has risen by almost 10 points to 63.4% and the dispersion between countries has narrowed, although Greece and Italy are in a worse situation than they were in 2005.

Similarly, while the employment gap between men and women in 2005 was approximately 15 percentage points in nine countries, and in the case of Malta, this figure exceeded 40 points, in 2021, only four countries had an employment gap of more than 15 points, considering that the average gap in the European Union has fallen substantially. Yet, unemployment gaps between men and women are positive. That is, unemployment is higher for women in most countries in both 2005 and 2021, and although a general reduction is observed, the gaps in Greece and Spain are still very high.

Another of the definitive variables for assessing the incorporation of women into the labor market is part-time employment. Traditionally, Northern European countries have had a much higher incorporation of women into the labor market than the rest of the countries. Nonetheless, these high rates are of part-time employment which implies that women did not have economic independence. Thus, they were not fully part of the organization because they were relegated to the background, for they have a reduced working day and no career expectations. That is why the data in Table 3 shows high rates of part-time employment in some countries such as the Netherlands, with 74.7% of women's employment in 2005, or Sweden, Belgium, Germany, and Luxembourg. At the same time, the part-time employment gap was very low, which means that men mostly had full-time jobs and relegated part-time jobs to women. By contrast, in 2021, the proportions of part-time employment of women and the differences between part-time employment of women and men have not been significantly reduced, and by contrast, they have even risen in some countries such as Germany, Denmark, Finland, and Italy.

As far as wage gaps[6] are concerned, in 2006, they were higher than 15 points in most countries, including countries with low employment gaps such as Sweden, Finland, Denmark, Estonia, Germany, and Austria. Between 2006 and 2020, a reduction in the wage gap was observed in most countries and very significantly in Luxembourg, Cyprus, Spain, and Poland; however, there was an increase in the wage gap in Latvia, Portugal, Malta, and Hungary.

Finally, it is necessary to take into consideration the segregation of employment in specific economic sectors, particularly, those related to education and healthcare. Traditionally, the employment channel for women in all those activities was related to "unpaid reproductive work" performed by them in their homes. This has resulted in the depreciation in labor terms of a good part of the occupations within these productive sectors, and it has manifested in the form of lower salaries. In this way, Figure 3 shows data on the share of employment of women and men over 15 years of age in education, health, and social work activities. In the years 2013 and 2022, respectively, the data are conclusive: except for Romania, Bulgaria, and Cyprus, more than 25% of women in the EU are employed in productive sectors typically occupied mostly by them, and in the case of Denmark, Sweden, Belgium, Finland, the Netherlands, Ireland, and France, this figure exceeds 35%. However, in the case of men, only more than 10% are employed in these sectors in three or four

management, and so on. Nonetheless, it neither includes any items on the position of women in the company nor the subdivision of responses between men and women.

5 The nomenclature of the EU countries corresponds to abbreviations of the names in the national language of each of them; the alphabetical order of the abbreviations is as follows: Austria AT, Belgium BE, Bulgaria BG, Cyprus CY, Czechia CZ, Germany DE, Denmark DK, Estonia EE, Greece EL, Spain ES, European Union - 27 countries EU-27, Finland FI, France FR, Croatia HR, Hungary HU, Ireland IE, Italy IT, Lithuania LT, Luxembourg LU, Latvia LV, Malta MT, Netherlands NL, Poland PL, Portugal PT, Romania RO, Sweden SE, Slovakia SK, and Slovenia SL.

6 The wage gap used is called the unadjusted gender pay gap and is defined by Eurostat as the difference between the average gross hourly earnings of men and women expressed as a percentage of the average gross hourly earnings of men. It is usually calculated for enterprises with 10 or more employees.

TABLE 3 Labor market conditions for women.

	Employment rate		Employment gap		Unemployment gap		Part-time employment % of the total and gap				Gender pay gap	
	Women		W-M		W-M		Women		W-M			
	2005	2021	2005	2021	2005	2021	2005	2021	2005	2021	2006	2020
AT	61,1	68,1	12,6	8,6	0,4	−0,1	39,3	49,2	5,7	10,5	25,5	18,9
BE	53,8	61,8	14,5	6,9	1,8	−0,8	40,4	39,5	7,1	10,4	9,5	5,3
BG	51,7	64,2	8,3	7,8	−0,5	−0,5	2,3	1,8	1,5	1,3	12,4	12,7
CY	58,4	65,3	20,8	11,4	2,1	0,6	13,2	12,7	3,2	7,8	21,8	9,0
CZ	56,3	67,1	17,0	14,2	3,4	1,1	8,0	9,6	1,6	2,5	23,4	16,4
DE	59,6	72,2	11,7	7,1	−0,6	−0,8	43,4	47,4	6,9	10,6	22,7	18,3
DK	71,9	72,6	7,9	5,8	0,8	0,1	32,6	33,5	11,7	15,2	17,6	13,9
EE	63,1	72,4	3,6	3,2	−2,3	−1,3	9,1	16,9	4,5	7,6	29,8	21,1
EL	46,0	48,2	27,4	18,2	9,3	7,6	9,1	12,5	2,2	5,0	20,7	
ES	51,8	57,9	23,3	9,6	4,8	3,6	23,4	22,3	4,4	6,3	17,9	9,4
FI	66,5	71,7	3,8	1,9	0,4	−1,2	18,2	23,2	8,6	11,0	21,3	16,7
FR	58,4	64,5	10,9	5,6	1,5	−0,2	30,3	27,4	5,6	7,6	15,4	15,8
HR	48,6	58,6	13,1	9,6	2,4	0,7	10,7	5,8	5,4	3,7		11,2
HU	51,0	68,2	12,1	9,7	0,4	0,4	5,6	6,7	2,4	2,7	14,4	17,2
IE	58,3	65,5	18,6	8,8	−0,7	−0,3		29,6		11,0	17,2	
IT	45,4	49,4	24,5	17,7	3,8	1,9	25,5	31,5	4,3	8,4	4,4	4,2
LT	59,6	71,9	6,8	1,0	0,4	−1,0	8,8	7,6	5,1	4,3	17,1	13,0
LU	53,7	66,0	19,6	6,6	2,3	0,7	38,2	30,9	2,4	7,0	10,7	0,7
LV	58,2	68,0	8,2	3,9	−0,1	−1,9	9,7	10,0	5,6	5,6	15,1	22,3
MT	33,4	67,3	40,1	15,4	2,1	−0,7	20,2	18,5	4,1	5,4	5,2	10,0
NL	63,0	76,6	15,1	7,0	1,8	0,5	74,7	65,0	21,6	22,5	23,6	14,2
PL	46,8	63,8	12,1	13,0	2,6	0,0	13,3	7,6	7,0	3,3	7,5	4,5
PT	61,6	67,7	11,7	5,0	2,0	0,5	13,3	9,1	3,8	4,7	8,4	11,4
RO	51,5	52,5	12,2	18,6	−1,3	−0,9	9,2	3,0	9,1	4,1	7,8	2,4
SE	70,4	73,3	4,0	4,1	−0,2	0,5	39,2	29,7	10,3	12,0	16,5	11,2
SI	61,3	68,1	9,1	6,4	1,0	1,1	9,8	12,8	6,1	6,2	8,0	3,1
SK	50,9	65,6	13,7	7,7	1,7	0,3	3,9	4,6	1,2	1,8	25,8	15,8
EU27	**54,7**	**63,4**	**15,0**	**9,9**	**1,8**	**0,6**	**28,3**	**28,8**	**6,3**	**8,1**	**15,5**	**13,0**

Source: Own elaboration from Eurostat, Labour Force Survey.

countries. While the data on the evolution between 2013 and 2022 do not show a generalized pattern, both decreases and increases in the employment intensity of women in the sector are discernible.

Therefore, the labor market statistics at the European level reveal that there is greater incorporation of women into the labor market. Nonetheless, although there has been a reduction in the problems of discrimination in terms of working hours and wage gaps, the differences between women and men continue to be generalized, and in many countries, at high levels, especially in terms of the segregation of employment in productive sectors.

5.2. Economic power and the glass ceiling

Apart from the situation of women in the EU labor market, it is also interesting to consider the variables strictly related to both the economic power in the firm and the professional development of women. Especially relevant in this respect are the continued segregation of occupations in the workplace that women must face and the issue of the glass ceiling, which have, respectively, been for many years not only on the national but also on the European agenda.

In this regard, the first approximation to the state of the question is found in the results of the 2015 European Working

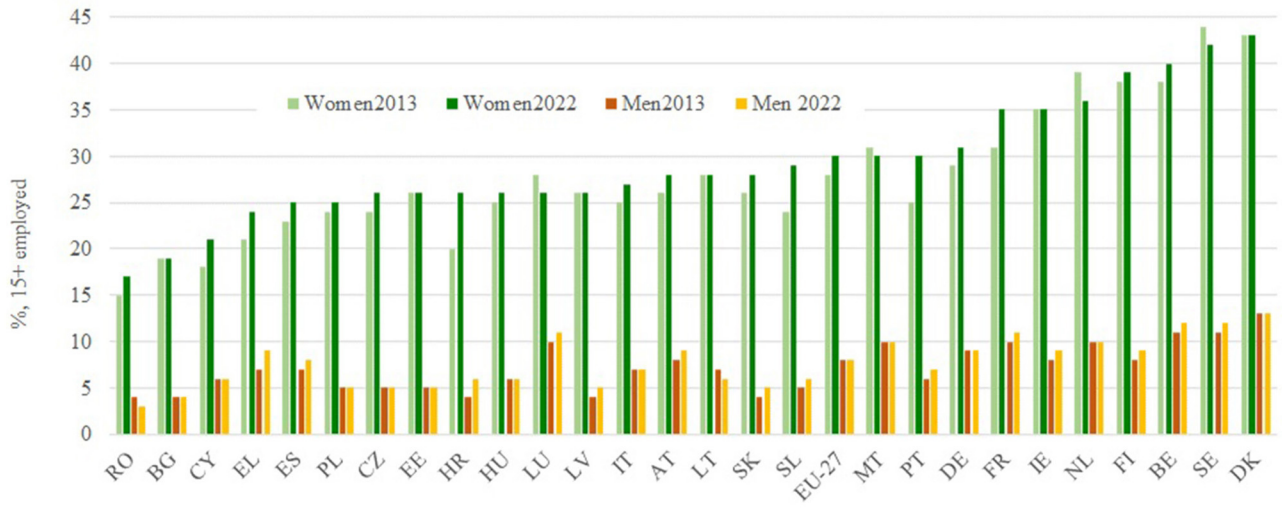

FIGURE 3
Employed people in Education, Human Health, and Social Work activities (%, 15+ employed). Source: Gender Equality Index, EIGE.

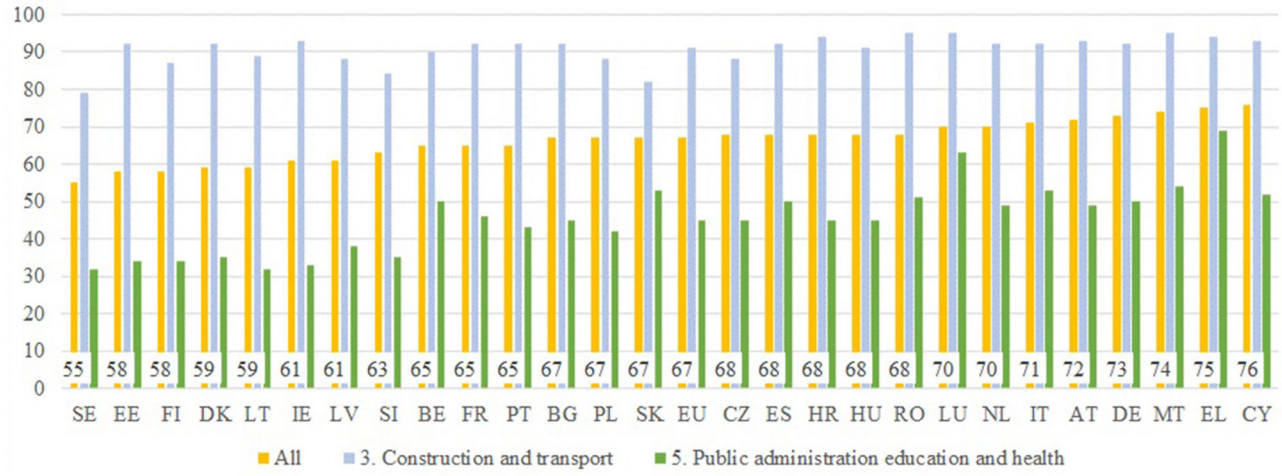

FIGURE 4
Is your immediate boss a man? Source: Own elaboration from EWCS (2015).

Conditions Survey (EWCS).[7] Figure 4 summarizes the responses on the gender of the immediate boss in all economic sectors (the figure is shown in the graph) and in clearly masculinized and feminized productive sectors, in particular, it should be noted that in all productive sectors, the proportion of male managers exceeds 50% in all countries. The lowest level is Sweden, followed by Estonia, Finland, Denmark, and Lithuania, as countries with the highest proportion of female middle managers, but still clearly below 50%. In several countries such as Cyprus, Greece, Malta, Germany, Austria, Italy, the Netherlands, and Luxembourg, the proportion of men in middle management or executive positions is 70% or higher. Regarding the distribution of the proportion of male managers in productive sectors in the employment of men and women, data connected to "the construction and transportation" group as a masculinized sector and "the public administration, education, and health" group as a feminized sector. In the case of the "construction and transport" group, the lowest proportion of male managers is in Sweden with 79%, and in a significant number of countries, such as Malta, Romania, Greece, Cyprus, Germany, Austria, Italy, the Netherlands, and Luxembourg, the proportion of male managers exceeds 90%. Respectively, in the "public administration, education, and health" group, the higher proportion of women in employment places the proportion of male managers at around 50%. There are a significant number of countries, including Sweden, Estonia, Finland, Denmark,

7 The EWCS is developed every 5 years. However, the 2020 edition was not carried out due to the pandemic and that is why, in 2021, it was elaborated using an extraordinary telephone edition in which specific questions on working conditions during COVID-19 were included.

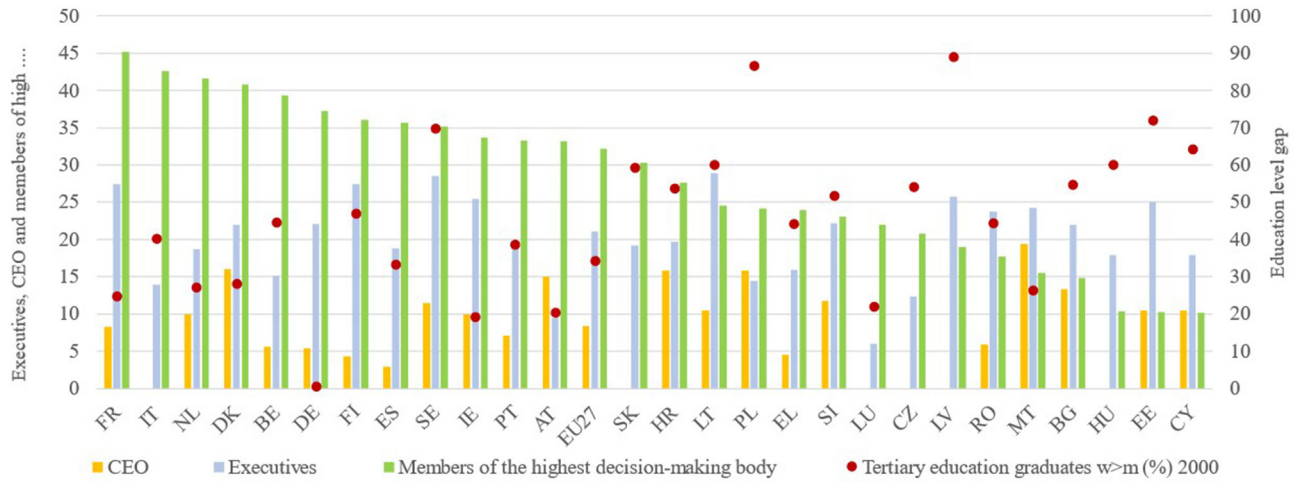

FIGURE 5
The proportion of women among chief executive officers (CEO), executives, and members of the highest decision-making body of the largest nationally registered companies listed on the national stock exchange 2022. Source: Own elaboration from EIGE.

Lithuania, Ireland, Latvia, and Slovenia, in which the percentage of female managers is higher than that of male managers. As far as the other productive sectors that are not included in the graph are concerned, for instance, the "agriculture and industry" sector has a proportion of male managers similar to that of construction and transportation, and the "commerce and hotel and catering" and "financial and other services" sectors present figures around the average of the "total sectors."

As shown below, Figure 5 displays the 2022 data for the proportion of women among Chief Executive Officers (CEOs), female executives, and members of the decision-making body of the largest registered companies which are listed on the national stock exchange. Considering the data for CEOs, the proportion of women is nearly zero in most of the countries as opposed to the countries with higher participation of women such as Malta, Poland, Slovakia, Austria, and Denmark with barely 15%. In the case of the team of executives working with the CEO in large, listed companies, the representation of women is higher since it is a lower rank than that of the CEO and equally heterogeneous in the context of EU countries. Yet, Lithuania and Sweden stand out with nearly 29% of female executives and, at the bottom of the distribution, Luxembourg with 6% of women compared to 94% of men.

The third variable included in Figure 5 is the proportion of women in the highest decision-making bodies of large, listed companies at the national level. In general terms, this variable shows the least unbalanced ratio between women and men. In one-third of the countries, the proportion of women exceeds 35%, and in France, Italy, the Netherlands, and Denmark, it surpasses 40%, which, although not equal, would be far from the underrepresentation of the proportion of female CEOs. It is also noteworthy that there is no relationship between female CEOs or executives and those who are part of the highest decision-making body in the different countries. That is, for the time being, no contagion phenomenon favoring the increase of female CEOs or executives has been observed in countries where more than 40% of the members of the highest decision-making body are women and in reverse.

In relation to this increased representation of women in the highest decision-making body, we hypothesize that the breakthrough that has occurred since 2010 may be related to the strong legal and real impetus of the European institutions in achieving the Beijing goals. Precisely, this is the main reason behind the establishment of the European Institute for Gender Equality (EIGE) in 2010 which was aimed to strengthen and promote gender equality throughout the EU. To illustrate this idea, Figure 6 shows the time series of the proportion of women among the members of the highest decision-making bodies of the largest listed companies at a national level, particularly those countries that have adopted legal measures for the equal representation of men and women on boards of directors (the highest decision-making body) between 2009 and 2011, namely Belgium, France, Spain, Italy, and the Netherlands. Even though there are minor differences in terms of the time at which the increase in women's representation begins, the intensity, and the final level reached, as can be seen in the case of Spain (more gradual and less level reached) and Italy (rapid and intense rise from 2011), the pattern of behavior is common to all the countries. That is, the representation of women is almost zero in the early 2000s, then, there is a change in trend around 2010 and a final level of more than 35%. The tertiary education gap has been included in the Figure 5, making evident the higher percentage of women with tertiary education and especially the notable absolute separation between training and executive positions.

The gender equality indexes, both the Gender Equality Index (GEI) of EIGE and the Global Gender Gap (GGG) of the World Economic Forum (WEF), are composed of several sub-indexes that study specific areas of gender equality, particularly interesting are the subdomains on Economic Power in GEI and Economic Participation in GGG. That is why Figure 7 shows the sub-index on the Economic Power of the GEI between the years 2013 and 2022. Interestingly, this graph reveals how the countries that have made the most progress in achieving equality of economic power are not

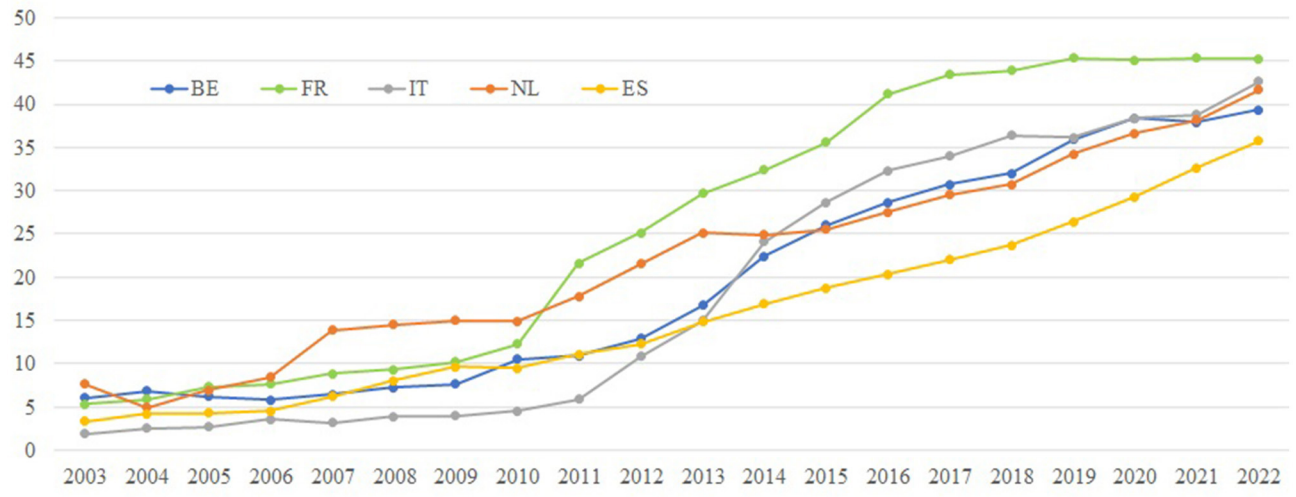

FIGURE 6
The proportion of women among members of the highest decision-making body of the largest nationally registered companies listed on the national stock exchange and education level gap. Source: Own elaboration from EIGE and Eurostat.

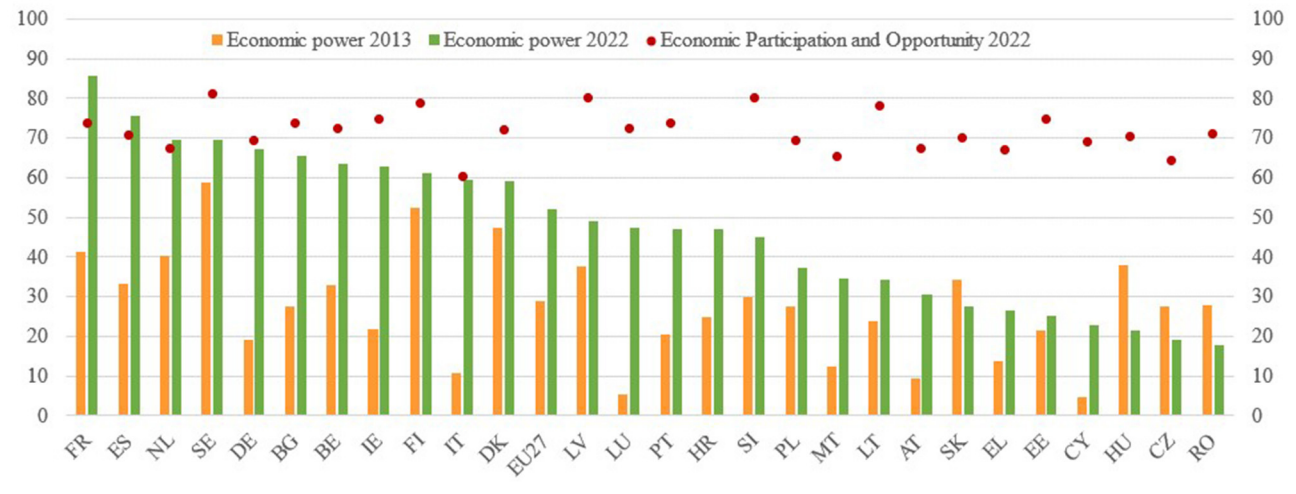

FIGURE 7
Gender equality index 2013–2022 subdomain economic power. Source: EIGE and WEF.

those that started from a better situation at the beginning of the series, but those that have established legal mechanisms to advance parity in the Boards of Directors.

Alternatively, in the GGG, within the four sub-indices that comprise the report, the section on gender gaps in leadership by industry has been thoroughly analyzed. More specifically, the examination has focused on the section on gender gaps in leadership by industry, where we see that the proportion of women hired in leadership roles has experienced a steady increase, from 33.3% in 2016 to 36.9% in 2022. However, while the proportion of women in leadership has been increasing over time, women have not been recruited equally in all industries. On average, more women have been hired for leadership positions in industries where they were already highly represented. The report ranks it as the second biggest challenge to equality. Based on the 102 countries analyzed, the remaining gap to be closed in this sub-index is 40%. At the current rate of progress, this gap will close in 151 years, representing several generations to parity.

In sum, the data reveal that progress is slow and inequality levels remain very high. However, it is necessary to highlight the evident but significant progress in the presence of women on the boards of directors of companies that have established affirmative action measures.

5.3. Qualitative indicators and opinion surveys

To complement the previous analyses, it is also necessary to develop an examination of the results obtained in surveys on gender discrimination and equality carried out by different

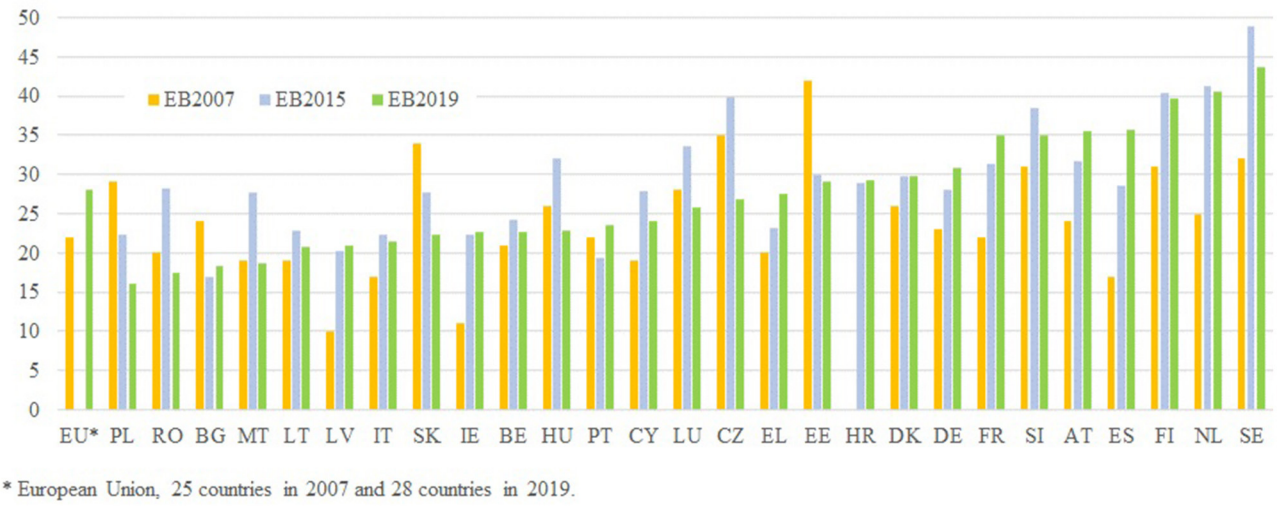

FIGURE 8
When a company wants to hire someone and has a choice between two candidates with the same skills and qualifications, in your opinion, does the candidate's gender put the candidate at a disadvantage? Source: Own elaboration from Eurobarometer, Discrimination in the European Union, 2007, 2015, and 2019.

EU institutions. Although the surveys do not directly ask about elements of corporate culture, they reveal how different stereotypes and discriminatory elements remain. Interestingly, these results can be deployed as an illustration of the actions that may be carried out in future to improve the corporate culture on gender equality.

Stereotypes that respond to women's specialization in caregiving tasks and their lack of professional ambition and men's position as providers of the household have been considered. Table 4 collects the percentage of affirmative responses to the questions posed in the 2015 Eurobarometer about Gender Equality, with highlighted cells corresponding to those with a high percentage of responses. Interestingly, in all three questions, the percentage of affirmative responses is very heterogeneous between countries while the stereotype is more widespread among women than among men. The first question is "All in all family life suffers when the mother has a full-time job," and it is the one with the highest percentage of affirmative answers, especially among women and men in Hungary, Bulgaria, and Cyprus. In the case of the second question which is "A father must put his career ahead of looking after his young child," Hungary is the country with the strongest stereotype between men and women. Ultimately, the answer to the question "Women are less willing than men to make a career for themselves," has the lowest affirmative answers in most countries with the highest affirmative values given by Hungarian, Bulgarian, and Romanian women.

To assess the perception of discrimination at work, this article examines the Eurobarometer surveys on Discrimination in the European Union from 2007, 2015, and 2019. Particularly, Figure 8 analyzes the perception of discrimination in access to positions through affirmative answers to the question: "When a company wants to hire someone and has a choice between two candidates with the same skills and qualifications, in your opinion, does the candidate's gender put the candidate at a disadvantage?" In general, it is observed that the perception of discrimination is higher in 2015 and 2019 than in 2007. Sweden, the Netherlands, Finland, Spain, Austria Slovenia, and France are highlighted as the countries with the highest perception of discrimination in 2019 whereas Poland, Romania, Bulgaria, and Malta are the countries with the lowest perception of discrimination. Interestingly, this is consistent with the fact that these are countries with very strong gender stereotypes, as can be seen in Table 4.

Thanks to the analysis of the data from the 2015 EWCS, Table 5 shows the percentage of men and women expressing disagreement or agreement with several statements. To make the chart easier to read, the cells in which the proportion of female responses is equal to or greater than male responses are shaded. The questions are the following:

"I receive the recognition I deserve for my work": In most countries, women disagree with this information to a greater extent than men. The figure is particularly high in Slovakia, Slovenia, and Hungary where nearly one-third of the women surveyed feel that they do not receive the recognition they deserve.

"My job offers good prospects for career advancement": There is a generalized disagreement in all countries, and it is higher among women than men, especially in Italy, Luxembourg, Romania, Germany, and Austria.

"Have you been subjected to discrimination at work in the last 12 months?": Women have a higher perception of discrimination toward themselves than men. This is most notable in Luxembourg, Sweden, the Netherlands, and Austria.

"Are you treated fairly at your workplace?": There is not a substantial difference between men and women. However, the proportion of people who think they are treated fairly on rare occasions at their workplace is very high in Slovakia, Cyprus, Poland, and Lithuania.

Finally, Figure 9 shows the percentages of affirmative responses to the question: "Is enough being done to promote diversity in your workplace?" This question is relevant, for it illustrates how

TABLE 4 Stereotypes about women at work.

	All in all family life suffers when the mother has a full-time job		A father must put his career ahead of looking after his young child		Women are less willing than men to make a career for themselves	
	Women	Men	Women	Men	Women	Men
AT	38,7	31,3	7,2	9,9	10,7	12,3
BE	18,8	11,9	3,6	2,9	5,1	3,1
BG	46,4	43,1	14,3	20,9	16,1	13,8
CY	43,8	43,8	3,6	2,8	4,6	5,9
CZ	27,8	18,5	7,2	8,8	9,8	6,0
DE	31,2	26,1	5,6	5,5	6,3	4,7
DK	13,7	9,2	4,6	3,6	8,3	4,7
EE	27,1	23,4	5,3	4,5	5,8	3,7
EL	40,0	39,0	7,8	8,1	4,2	9,4
ES	39,8	27,7	9,4	9,3	4,6	4,8
FI	6,6	5,1	5,6	5,7	3,6	1,8
FR	24,9	16,8	4,3	3,5	2,6	3,3
HR	27,5	26,7	4,3	5,5	5,9	8,5
HU	47,5	41,4	20,3	20,4	17,2	14,3
IE	24,0	19,1	8,4	9,7	9,1	6,0
IT	26,4	23,2	9,0	8,3	10,6	8,6
LT	37,3	27,1	6,4	6,2	10,2	6,5
LU	33,3	22,6	2,4	4,8	6,7	3,8
LV	47,6	33,2	15,0	9,8	5,4	3,6
MT	35,1	32,7	4,5	8,8	11,0	8,3
NL	17,4	13,9	5,1	3,6	7,0	1,8
PL	29,6	21,7	9,0	6,4	9,6	6,6
PT	30,2	25,5	4,5	4,6	8,0	7,3
RO	35,8	27,2	14,4	13,2	16,8	12,9
SE	8,4	7,3	1,7	0,7	1,5	2,7
SI	30,3	20,4	5,0	6,4	7,5	9,1
SK	20,5	18,3	13,5	14,3	11,1	12,0

Source: Eurobarometer, Gender Equality, March 2015. European Commission.

employees perceive the efforts of their respective companies to promote gender equality and what are the changes in corporate culture in this regard.

The data show that the change in workers' perception of the effort being made in their respective workplaces is very high. That is, workers in all countries, except for Romania, acknowledge that more is being done in their workplaces to promote gender equality. Remarkably, however, it is not the specific percentage of each country, but the fact of recognizing that inequality exists and that companies have a role to play in solving the problem.

6. Discussion

Although women's participation in the labor market has significantly grown in recent years, the glass ceiling prevents women from occupying all positions in the organizational hierarchy on an equal level to men. For this reason, several regulations, both at the community and state levels, have been developed to promote the achievement of equal opportunities between men and women in the business environment.

Key strategies in the fight against gender inequality in companies have been CSR and GSR which, respectively, aim to have a clear influence on the cultural patterns of organizations. In the last few decades, certain interest groups have demanded the incorporation of the concept of gender mainstreaming into business policies since before acting, it is necessary to define and reflect on which stakeholders will be affected by the company's decision. It is against this backdrop that we believe that there is a necessity to add sustainable development to the corporate objective of value creation, for it would ensure a balance between economic growth and social welfare. As it has been found, corporate culture cannot be legislated as such which is why the EU had to create binding regulations. These rules have been aimed at forcing

TABLE 5 European working conditions survey 2015.

	I receive the recognition I deserve for my work		My job offers good prospects for career advancement		Have you been subjected to discrimination at work in the last 12 months?		Are you treated fairly at your workplace?	
	Disagree		Disagree		Yes		Sometimes, rarely or never	
	Women	Men	Women	Men	Women	Men	Women	Men
AT	**12**	10	**44**	33	**13**	12	10	11
BE	**15**	15	**43**	33	**10**	10	13	14
BG	14	19	37	37	2	3	12	16
CY	**10**	9	**30**	26	**9**	9	27	31
CZ	**12**	12	**34**	26	**6**	5	13	14
DE	**14**	14	**46**	35	**6**	6	9	10
DK	**11**	11	**24**	24	**7**	4	**9**	9
EE	12	17	32	33	9	11	12	14
EL	**14**	13	**37**	29	**10**	6	**19**	15
ES	16	17	**48**	42	**5**	5	21	22
FI	**12**	11	**38**	31	**11**	7	7	8
FR	**18**	16	**49**	40	**12**	10	**20**	18
HR	**29**	29	**47**	44	**4**	3	19	23
HU	**17**	17	28	32	4	7	16	18
IE	**18**	15	**36**	31	6	7	**14**	14
IT	**16**	14	**53**	42	**7**	6	13	19
LT	**17**	17	**45**	44	**6**	2	24	26
LU	**25**	18	**46**	32	**16**	11	**17**	10
LV	**22**	17	**37**	35	**8**	7	**18**	16
MT	18	22	30	33	**5**	4	16	19
NL	**12**	12	**43**	35	**13**	11	7	10
PL	**18**	21	27	28	2	3	27	28
PT	**12**	11	**38**	36	**5**	3	13	19
RO	**11**	8	**36**	25	8	9	**16**	15
SE	**15**	11	**41**	32	**14**	9	**14**	12
SI	**33**	30	**44**	38	**10**	6	18	19
SK	**31**	24	**45**	39	**8**	5	**34**	34
EU-27	**16**	15	**41**	35	**8**	7	15	17

Source: Own elaboration from EWCS (2015). The bold values indicate that these are the situations in which women feel more affected than men.

organizations not to group economic power in men justified exclusively by a biological reason.

After the examination of the European legislation on equality, it could be asserted that progress is slow since the data reveal that if current trends continue, we will need almost another 100 years to achieve full equality. Within the sections in which gender discrimination in the workplace is usually analyzed, it can be claimed that the ones that still require the greatest effort are money (pay gaps), time (precariousness of women's working conditions and family life balance), and power (presence in decision-making). Particularly, the present study has focused on dissecting the last sector which corresponds to the presence of women in corporate decision-making bodies. This has revealed that the most effective measure for the underrepresentation of women in the sphere of corporate power is the so-called "minimum share" since countries that have adopted gender parity laws on boards of directors have increased the presence of women in them.

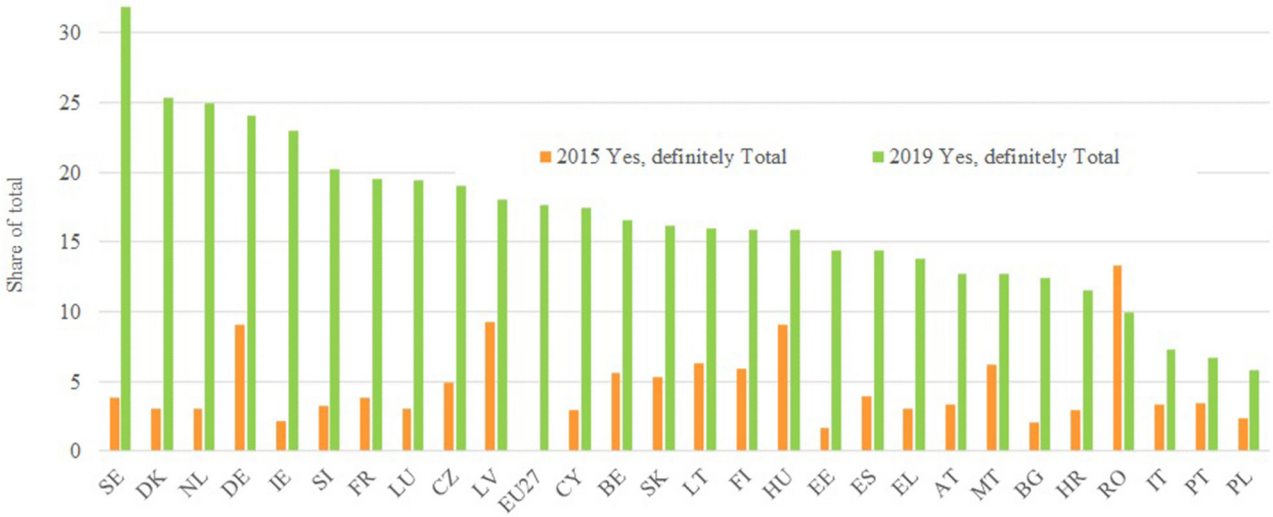

FIGURE 9
Is enough being done to promote gender equality in your workplace? Source: Own elaboration from Eurobarometer, Discrimination in the European Union, 2015 and 2019.

Despite regulatory efforts, statistical analysis shows that the situation of women in the labor market continues to be discriminatory: They are the ones who have lower activity rates, higher unemployment rates, lower salaries, and live with the glass ceiling that prevents them from reaching decision-making positions. However, we contend that there are still weaknesses within the EU legislative framework since not all measures are binding and those that are binding normally have limited coercive capacity, that is, as there are practically no sanctions for non-compliance with the standard, most of the texts are based on a series of recommendations that do not detail how to implement effective equality measures in companies.

As far as the quantitative analysis of the business climate is concerned, this has been extremely complex since it includes many qualitative elements that cannot be captured in observable variables. Thus, in the absence of any European statistics on business culture and its impact on gender inequality, we have conducted the research using labor statistics and opinion surveys. Remarkably, however, the results on the proportion of women in the highest corporate decision-making body show a very regular pattern of behavior. Namely, in the early 2000s, the presence of women in these bodies was practically absent, whereas, in the 2010s, there is a change in the trend due to the legal measures imposed for equality between women and men, proving that these have been effective.

In sum, if the maintenance of this inclination is desired, there needs to be a transformation along with a cultural change in the company: Gender equality must be recognized by organizations as an internal moral obligation beyond any legal text. It is necessary to adapt the organizational culture to the new social situation capable of overcoming values based on gender stereotypes.

Data availability statement

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

Author contributions

Both authors developed, discussed, worked on the article, the legal analysis has been carried out mainly by IG and the statistical analysis mainly by NA. Both 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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References

Bastida, M. (2009). Implantación de la igualdad de género en las organizaciones. *Estudios Econ. de Desarrollo Int.* 9, 91–118.

Bayón Pérez, J. (2019). *Cultura Empresarial*. [Corporate Culture] Elearning, S. L.

Boldó Roda, C. (2015). Principio de igualdad y cooperativismo en el ámbito de la responsabilidad social corporative. *Rev. Valenciana d'Estudis Auton.* 60, 93–116.

Carroll, A. B. (1991). The pyramid of corporate social responsibility: Toward the moral management of organizational stakeholders. *Bus. Horizons* 34, 39–48. doi: 10.1016/0007-6813(91)90005-G

Chiavenato, I. (2011). *Administración de recursos humanos: El capital humano de las organizaciones*. Novena: Mc Graw Hill.

Cisneros, A., S. and La Torre J. L. V. (2004) "Acerca de la Cultura Organizacional" ["On Organizational Culture"]. *Cultura* 18 : 227–239.

Commission of the European Communities (2011). *Promoting a European Framework for Corporate Social Responsibility*.

Cortina Orts, A. (2003). *Construir confianza : ética de la empresa en la sociedad de la información y las comunicaciones [Building Trust : Business Ethics in the Information and Communication Society]*. Madrid: Trotta.

de Luis Carnicer, P., Cuenca, E. B., Jiménez, M. J. V., and Pérez, M. P. (2011). Presencia equilibrada entre mujeres y hombres en consejos de administración: identificación de los Stakeholders. *Cuadernos Gestión* 11, 49–72. doi: 10.5295/cdg.100243pd

European Commission (2021). *Special Eurobarometer 509: Social issues (v1.00). Communication*. Available online at: http://data.europa.eu/88u/dataset/S2266_94_2_509_ENG (accessed December 2022).

European Economic Community (1997). *Treaty of Amsterdam*. Amsterdam: Official Journal of the European Communities.

European Institute for Gender Equality (EIGE). *Gender Statistics Database*. Available online at: https://eige.europa.eu/gender-statistics/dgs (accessed December 2022).

European Statistical Office (Eurostat). *Labour Force Survey (LFS)*. Available online at: https://ec.europa.eu/eurostat/web/lfs/database (accessed December 2022).

European Statistics Office Eurostat (2022). *European Union Labour Force Survey*. Diciembre de. Available online at: https://ec.europa.eu/eurostat/web/microdata/european-union-labour-force-survey

EWCS (2015, 2021, 2022). *European Foundation for the Improvement of Living and Working Conditions (Eurofound) European Working Conditions Surveys (EWCS)*. Available online at: https://www.eurofound.europa.eu/surveys/european-working-conditions-surveys-ewcs (accessed December 2022).

Freeman, R. E. (1984). *Strategic Management: A Stakeholder Approach*. Cambridge: Cambridge University Press.

González González, M. (2021). Perspectiva de género en las empresas. Hacia la igualdad laboral a través de la responsabilidad social empresarial. *Cuestiones Género*. 16, 708–728. doi: 10.18002/cg.v0i16.6968

Grosser, K., and Moon, J. (2005). Gender mainstreaming and corporate social responsibility: Reporting workplace issues. *J. Bus. Ethics* 62, 327–340. doi: 10.1007/s10551-005-5334-3

Holst, E., and Kirsch, A. (2016). Corporate boards of large companies: More momentum needed for gender parity. *DIW Econ. Bull.* 6, 13–25.

International Labour Organization (1958). *Discrimination (Employment and Occupation) Convention*. Geneva: International Labour Organization.

Kahale Carrillo, D. T. (2013). *La Responsabilidad Social de Género*. Pamplona: Thomson Reuters.

Kirsch, A. (2021). *Women on Boards Policies in Member States and the Effects on Corporate Governance: Study for the Committee of Legal Affairs, Policy Department for Citizens' Rights and Constitutional Affairs, European Parliament*. Brussels: European Union.

Larrieta, I., Velasco, E., Aldamiz-Echevarría, C., Fernández, S., and Itxaurburu. G. (2014). "La Responsabilidad Social como instrumento para el fomento de la igualdad de gŵnero en la empresa: La Responsabilidad Social de Género" ["Social Responsibility as an Instrument for the Promotion of Gender Equality in Business: Gender Social Responsibility"]. *Revista de Dirección y Administración de Empresas*. 21, 181–202. Available online at: http://hdl.handle.net/10810/14341

María Jesús, B. M. (2016). *Gestión estratégica del clima laboral [Strategic Management of Work Environment]*. Madrid: Universidad Nacional de Educación a Distancia.

Martínez Méndez, K. I. (2018). Segregación laboral, el caso de las Ingenieras Mecánicas Electricistas. *Cuest. Género* 13, 89–105. doi: 10.18002/cg.v0i13.5402

Marulanda, N. L. A., Flórez, A. K. P., and Blanco-Ariza, A. B. (2019). Empoderamiento Femenino E Igualdad De género En Las Organizaciones. *Liderazgo Estratég.* 9, 140–148.

Medina-Vicent, M. (2015). Law and ethics: A necessary complementarity to increase women's presence in business managerial positions. *J. Acad. Perspect.* 3, 1–18.

Medina-Vicent, M. (2016). Responsabilidad Social de Género y obligatoriedad moral. *Femeris* 2, 30–48. doi: 10.20318/femeris.2017.3546

Pearson, R., and Seyfang, G. (2002). "'I'll tell you what I want…': women workers and codes of conduct," in *Corporate Responsibility and Labour Rights* (Londres: Routledge) 43–60.

Publications Office of the European Union (2022). *EUR-Lex*. Available online at: https://eur-lex.europa.eu/homepage.html (accessed December 2022).

Reverter Bañón, S. (2008). Sociedad civil, ciudadanía y género. *La Aljaba Segunda época*. 12, 33–52.

Rumí, M. E. M., Moreno, M. J. G., and Ruano, A. J. M. (2016). "La Responsabilidad Social de las empresas en materia de igualdad de género y su relación con el trabajo social," in *Respuestas transdisciplinares en una sociedad global: aportaciones desde el Trabajo Social* (Logroño: Universidad de La Rioja) 108.

Soares, R., Marquis, C., and Lee, M. (2011). Gender and corporate social responsibility: It'sa matter of sustainability. *Catalyst* 2011, 78–92.

Solimene, S., Coluccia, D., and Fontana, S. (2017). Gender diversity on corporate boards: an empirical investigation of Italian listed companies. *Palgrave Communic.* 3, 1–7. doi: 10.1057/palcomms.2016.109

United Nations (1985). *Nairobi Declaration*. Report of the Third World Conference on Women. Nairobi: United Nations.

United Nations (1995). *Beijing Declaration*. Report of the Fourth World Conference on Women. Beijing.

United Nations (2015). Sustainable Development Goals. Available online at: https://www.un.org/sustainabledevelopment/ (accessed December 2022).

United Nations General Assembly (1981). *Convention on the Elimination of all Forms of Discrimination against Women*. New York: United Nations General Assembly.

United, Nations (1945). *United Nations Conference on International Organization*. Charte of the United Nations. San Francisco.

Vacca, A., Iazzi, A., Vrontis, D., and Fait, M. (2020). The role of gender diversity on tax aggressiveness and corporate social responsibility: evidence from Italian listed companies. *Sustainability* 12, 2007. doi: 10.3390/su12052007

Valcárcel, A. (2007). "El techo de cristal en las empresas," in *Las mujeres en la dirección de las empresas* (Santander: Universidad Internacional Menéndez Pelayo).

World Economic Forum (2022). *Global Gender Gap*. Report.

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Organizational health climate as a precondition for health-oriented leadership: expanding the link between leadership and employee well-being

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The link between leadership and employee well-being is long established. In particular, health-oriented leadership is discussed as a leadership style specifically promoting employee well-being. However, the preconditions of health-oriented leadership remain largely unexplored. From the perspective of conservation of resources theory, leaders can only provide resources when receiving some themselves. We propose that organizational health climate (OHC) is an important organization-based resource for a health-oriented leadership style. More specifically, we hypothesize that the relationship between OHC and employee job satisfaction and emotional exhaustion is mediated by health-oriented leadership. We thereby differentiate two levels of analysis: a within-team level and a between-team level. We examined 74 teams with 423 employees of childcare centers at three time points, each 6months apart. By means of multilevel structural equation modeling, we found OHC to be a significant antecedent of health-oriented leadership at the between-team level. The relationship between OHC and employee job satisfaction was mediated by health-oriented leadership at the between-team level, but not at the within-team level. The relationship between OHC and employee exhaustion showed another pattern of relationships at the different levels of analysis, while it was not significantly mediated by health-oriented leadership. This indicates the value of differentiating between levels of analysis. We discuss the implications for theory and practice that can be drawn from our findings.

KEYWORDS

organizational health climate, health-oriented leadership, employee wellbeing, emotional exhaustion, job satisfaction, antecedents of leadership

1. Introduction

In the modern world, workplace well-being is an increasing concern for employees and organizations. Due to the intensification of work and increasing mental demands in many jobs, stress is becoming more prevalent, with potentially lasting consequences for employees' health and quality of life (Sonnentag and Frese, 2002; de Jonge and Dorman, 2017). Additionally, work

stress is among the most prevalent causes of sickness-related absence from work and is a highly cost-intensive issue for organizations. In 2020, the loss of gross value added due to sickness absence was estimated to be 144 billion euros in Germany (Brenscheidt et al., 2022), nearly 25% of which was due to psychological and stress diseases. These numbers are especially acute in the social care sector (e.g., education, child care and nursing), which have had, and continue to have, the highest sickness rates among all industrial sectors in Germany, resulting in significant costs and skill shortages (Kordt, 2014; Brenscheidt et al., 2022). Thus, the entire economy, and particularly the social care sector, require preventing stress and enhancing the well-being of employees to sustain employability in Germany, where our sample is situated.

Abundant research in the last 15 years has identified leadership as playing a significant role in employee well-being (Montano et al., 2017; Teetzen et al., 2022). Complementing this evidence, specific measures of health-oriented leadership have been formulated to acknowledge the leadership–well-being link, for example, the *health-oriented leadership* concept by Franke et al. (2014). It describes a comprehensive framework of attitudes and action patterns of leaders that enhance employee well-being and has great leverage in the improvement and maintenance of employee well-being (e.g., Vonderlin et al., 2021; Hauff et al., 2022). Moreover, such health-specific leadership concepts have been shown to contribute to employee well-being above and beyond what is considered generally constructive leadership (Gurt et al., 2011; Franke et al., 2014; Vincent-Höper and Stein, 2019; Kaluza et al., 2021). Therefore, to understand the mechanisms of how leaders influence employee health and well-being, it is important to consider their specific attitudes and behaviors toward health concerns at work through health-specific measurements.

However, the specific preconditions that leaders need to be able to lead in a health-oriented way and, thus, enhance employee well-being, have scarcely been researched (Alilyyani et al., 2018; Inceoglu et al., 2021), especially at the organizational level (for two exceptions, see Turgut et al., 2020; Krick et al., 2022). Previous research has largely focused on leaders' or employees' individual characteristics, behavior or job demands and resources (e.g., Arnold and Rigotti, 2020; Klug et al., 2022; Pischel et al., 2022). But leaders and employees are also embedded in organizational contexts that frame their behavioral scope (Oc, 2018). Neglecting organizational antecedents thus renders an incomplete picture of what is needed to promote healthy leadership. We suggest that the organizational climate, which defines the shared perceptions of organizational policies, practices, and procedures and their attached meaning to them (Loh et al., 2019), is a critical leadership precondition. More specifically, we believe that the *organizational health climate* (OHC, Zweber et al., 2016) provides a crucial antecedent for health-oriented leaders. OHC is a facet-specific climate measure that explicitly focuses on the psychological well-being of employees through the perceived organizations' prioritization of employee health (Zohar and Luria, 2005; Zweber et al., 2015). It is largely driven by senior management (Dollard and Bakker, 2010) and provides cues about the kinds of behaviors that are expected and rewarded in healthy organizations (Dollard et al., 2019). This is comparable to the role of other climate facets as normative contexts, such as safety climate, which acts as a safety signal for directors and teachers in schools that they work in a safe environment and can behave in safety-enhancing ways (Yulita and Idris, 2017).

In our study, we draw on the conservation of resources theory (COR, Hobfoll, 1989) and argue that leaders in possession of resources are more likely to invest these in employees (Hobfoll et al., 2018). Based on that logic, several studies have found a positive influence on leader behavior by task-related or relational job resources, such as delegation, autonomy, and social support (e.g., Arnold and Rigotti, 2020; Krick et al., 2022); however, organizational-level resources have been widely neglected. This lack of consideration of organizational-level factors has been criticized by Hobfoll et al. (2018) and is needed to provide the optimal organizational environment for health-oriented leadership behaviors to enhance employee well-being. As one of the few examples, Krick et al. (2022) found organizational HRM strategies to be a valuable antecedent for health-oriented leadership. Consistent with that, we believe OHC acts as an organizational resource for leaders by which they acquire orientation and encouragement to act in a health-oriented way. Thus, we propose that OHC is a valuable organizational antecedent of health-oriented leadership.

Furthermore, while research has linked OHC to improved psychological health and reduced psychological strain (Zweber et al., 2015), the mechanisms behind this relationship remain unclear (e.g., Kaluza et al., 2020). Since leaders are the focal figures to transport organizational values and priorities to lower-level employees, we further propose that health-oriented leadership is a key mechanism by which a healthy organizational climate influences employee well-being. According to COR theory, different resources (like an OHC and health-oriented leadership) initiate a resource caravan passageway by reinforcing each other and, hence, replenish the resource reservoir of employees to enhance their well-being and leave them less susceptible to resource loss (Hobfoll, 2012).

While the outlined mediation process is important to be considered, it is not clear at which level (between teams vs. within teams) the proposed mechanisms mainly take place. The functioning of an organization as a whole depends on intergroup cooperation as well as on the functioning of teams (van Knippenberg, 2003). Thus, the shared perceptions inherent in OHC and health-oriented leadership at the between-team level may be grounded in different social processes than the individual within-team perceptions (Dollard et al., 2012a), which has valuable implications for leaders wanting to lead those teams. Thus, we differentiate the mediating mechanisms at the between-team and within-team levels.

Summing up, the present study has the following goals. First, by using a three-wave longitudinal survey, we examine OHC as an organizational antecedent of health-oriented leadership and analyze its role as a precondition for health-related leadership behavior. Second, we analyze the role of health-oriented leadership as a mediator of the OHC–employee well-being link. Third, we examine the mediating mechanism of health-oriented leadership at different levels of analysis (within and between teams) to reveal different relational patterns. We examine all these research goals in childcare centers, a unique context whose workforce well-being is in particular need of enhancing due to the tremendous impairments in this sector as outlined above. The proposed research model can be viewed in Figure 1.

Our study thereby contributes to existing research in several ways. First and foremost, we enhance knowledge of the supporting preconditions of health-oriented leadership, counteracting the mentioned omission of organizational antecedents of leadership with regard to employee well-being. By doing so, we attempt to broaden the

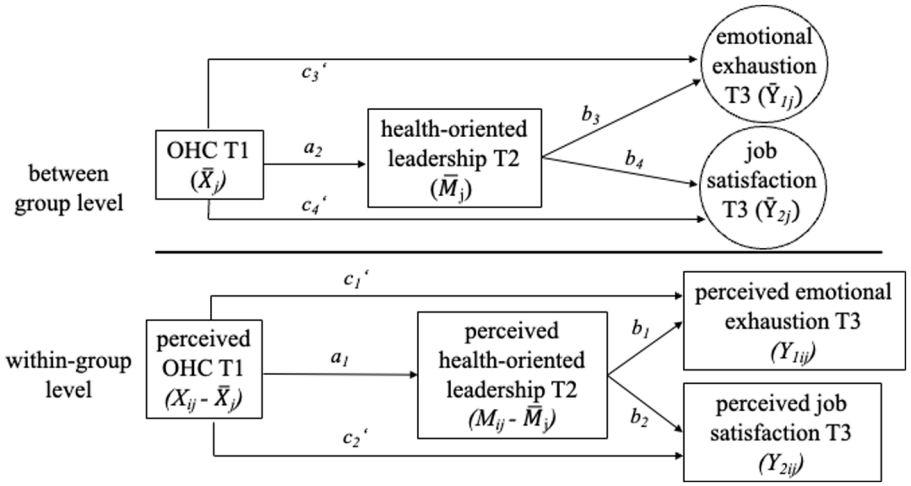

FIGURE 1
Proposed 2-2-1 mediation model $\overline{X}_j$ and $\overline{M}_j$ represent the aggregated OHC and health-oriented leadership of team *j*, respectively. X_{ij}, M_{ij}, Y_{1ij}, *and* Y_{2ij} represent the within-team OHC, health-oriented leadership, emotional exhaustion and job satisfaction of employee *i* in cluster *j*, respectively. For clarity, controls and autoregressive effect are not shown here.

scope to a more comprehensive framework that focuses on leaders and employees in the context in which they are embedded (Oc, 2018; Inceoglu et al., 2021). Contrary to personality (Tuncdogan et al., 2017) and leader ability (Courtright et al., 2016), organizational antecedents are more influenceable by organizations and can provide important starting points for supporting health-oriented behavior (Biron et al., 2018).

Second, we broaden the scope of the mediation processes of organizational climate. We thereby provide evidence for OHC as a distal factor to employee well-being and mediation via leadership, next to the more prominent mediators of job characteristics (e.g., Dollard et al., 2012a).

Finally, the differentiation of between-and within-team levels regarding the examined variables uncovers differences in relational patterns at different levels of analysis and advances theory and practice regarding the functioning of intergroup and intragroup dynamics. This can sensitize future research to differentiating levels of analysis.

2. Theory

2.1. Organizational health climate and health-oriented leadership

Research on organizational-level antecedents of leadership remains scarce (e.g., Sharma, 2018; Tafvelin et al., 2018). However, like employees, leaders also work in a contextual environment (Nielsen and Taris, 2019), which lays out the boundaries of the leadership playing field (Oc, 2018). Organizational climate establishes a framework for the desired and permitted behaviors of leaders in the workplace via their perceptions of implicit and explicit organizational policies and procedures (Hammer et al., 2019). However, a focus on the enhancement of employee well-being requires considering the organizational antecedents that improve this *particular* employee state. OHC is a facet-specific organizational climate that reflects organizational values and priorities regarding employee health and provides guidance for leadership behaviors via implicit norms and cues or explicit guidelines, thus functioning as an important leadership resource for enhancing employee well-being (Zohar, 2010; Zweber et al., 2015). Indeed, OHC is sensitive to improving employee well-being, as has been shown empirically by various studies (Zweber et al., 2015; Kaluza et al., 2020; Krick et al., 2022).

Health-oriented leadership is a specific facet of leadership that focuses on strengthening employee well-being and is clearly distinguishable from general leadership in influencing employee well-being (e.g., Gurt et al., 2011; Kaluza et al., 2021). It comprises two dimensions, StaffCare and SelfCare, which entail health-oriented values, awareness, and behaviors toward employees and leaders' own health, respectively (Franke et al., 2014). In this study, we focus on the behavioral dimension of StaffCare and define health-oriented leadership as the activities and actions leaders take to improve employee well-being (i.e., designing the workplace for employees and supporting open communication).

To effectively enhance employee well-being, the health-specific organizational guidelines that an OHC provides must be enacted in a health-oriented fashion by focal members of the organization, i.e., leaders (Dimoff and Kelloway, 2017). This can only happen when the "espoused theory" of organizational climate, meaning the perceived OHC, will actually be translated into an "enacted theory," meaning actual health-oriented leadership behaviors. This congruence between words and actions is grounded in the "theory of action," which states that the values and beliefs of what we intend to do (espoused theory) guide what we actually do (enacted theory; Argyris and Schön, 1974). According to the "theory of planned behavior" (Ajzen, 1985), subjective norms are then responsible for showing this particular behavior. Subjective norms are a person's belief that significant others approve of certain behaviors. Indeed, Biron et al. (2018) showed that organizational health climate was an antecedent of managerial quality in a cross-lagged panel of a sample of managers in four organizations. Similarly, Dollard et al. (2012a) found that OHC should

be implemented as a starting condition in the work stress cascade, indicating "better readiness for change implementation" (Loh et al., 2021, p. S. 533). Moreover, Turgut et al. (2020) showed that leaders' perceptions of subjective health norms in their organization were associated with their health-oriented leadership behaviour.

According to social exchange theory (Blau, 1964), leaders are more willing to show health-oriented leadership behaviors when the organization prioritizes employee well-being by providing organizational resources (Zohar and Luria, 2005; Zohar, 2010). Since corollary one of COR theory states that individuals in possession of resources are more likely to invest them, a resource in the form of OHC should make it more likely for health-oriented leaders to show health-oriented leadership behaviors and hand resources down to employees. This should be especially true for a facet-specific organizational resource such as OHC, since it sets the base for a greater congruence between words (OHC) and actions (health-oriented leadership) for employees (Zohar and Luria, 2005; Dollard et al., 2012b; Yulita and Idris, 2017; Biron et al., 2018). Dollard et al. (2012b) emphasize the importance of facet-specificity in terms of organizational climate, stating that "organizational climate constructs should be narrowly focused on the outcome of interest rather than broad bandwidth concepts" (p. 659). Indeed, the measurement of facet-specificity has been shown to increase the probability of detecting the desired behavior in various climate (e.g., Clarke, 2006). Thus, an OHC should promote leaders' sense-making process in the direction of health orientation and should encourage health-oriented behaviors (Kaluza et al., 2020).

> *H1*: OHC (at T1) is positively related to health-oriented leadership (at T2).

2.2. Health-oriented leadership and employee well-being

According to COR theory, stress occurs when employees' resources (i.e., things or conditions they value) are lost or threatened. In turn, as people strive to protect and foster their resources, being able to maintain one's resource level and gaining new resources has positive effects on well-being, according to the theory (Hobfoll, 1989; Hobfoll et al., 2018). Leaders influence the well-being of their employees through different pathways which reflect either the direct creation of resources or amplifying existing personal and organizational resources (Wegge et al., 2014).

For example, supporting behavior such as staff care can have direct effects on employees: By engaging in staff care, health-oriented leaders reduce stress and improve employees' health by offering advice, support and showing concern for health at work. Accordingly, several studies support staff care as a resource for employees in the sense of COR theory, showing direct relationships with a range of health outcomes (Horstmann, 2018; Klug et al., 2019; Santa Maria et al., 2019; Arnold and Rigotti, 2020; Kaluza et al., 2021).

Leadership can also have indirect effects via fostering job-related or personal resources, both of which can reduce stress: Health-oriented leadership in terms of staff care includes leaders' efforts to reduce stressors and create job resources for their employees by improving their teams' work organization and work characteristics (Franke et al., 2014; Arnold, 2017). Empirical evidence supports job resources as an important mediating mechanism between leadership and employee health (Teetzen et al., 2022), and staff care has been shown to relate to work-related resources (Franke et al., 2014). Additionally, psychological capital, as a personal resource, has been shown to mediate the positive impact of staff care on employee health in the long run (Arnold and Rigotti, 2020).

Beyond dyadic interactions, leaders also act as role models for their employees (Wegge et al., 2014). By the extent to which leaders tend to their own and employees' health, they set standards of acceptable and desirable behavior in their team. Via processes of social learning, employees may adopt similar behaviors for themselves (Dietz et al., 2020). A number of studies suggest that staff care facilitates employees' own self care, thus setting off a process in which employees cultivate their own resources at work (Franke et al., 2014; Horstmann, 2018; Santa Maria et al., 2019; Klug et al., 2022).

In summary, both theoretical models and empirical evidence suggest that health-oriented leadership functions as a direct resource for employees, but also as a resource caravan in the sense that staff care creates the foundations to accumulate further job-related and personal resources (see Hobfoll et al., 2018). We hypothesize the following:

> *H2*: Health-oriented leadership (at T2) is a) positively related to job satisfaction and b) negatively related to the emotional exhaustion of employees (at T3).

2.3. The mediation pathway between OHC and employee well-being via health-oriented leadership

Although research shows that OHC is positively related to employee well-being (e.g., Zweber et al., 2015), the mechanism between these two variables has seldom been studied (Schulz et al., 2017; Kaluza et al., 2020). The proposed mediation between OHC and employee well-being via health-oriented leadership is again based on COR theory (Hobfoll, 1989). The central idea of the theory is that people strive to obtain and preserve resources to acquire new ones. When multiple resources are gained, they travel in packs to form resource caravans (Hobfoll et al., 2018). For employees, the acquisition of multiple resources such as OHC and health-oriented leadership functions as a facet-specific resource caravan, which should promote job satisfaction. In case of emotional exhaustion, resource loss threats are high (Gorgievski and Hobfoll, 2008). In this situation, resource gain increases in importance to counteract resource loss (Hobfoll et al., 2018).

Dollard et al. (2019) stress that organizational climate affects worker psychological health by "shaping the social relations at work" (p. 10). This directly emphasizes the important role of leadership (Zohar and Luria, 2005), since leaders function as seminal figures and implementors of the organizational goals, priorities, and values and communicate which behaviors will be rewarded and which will be sanctioned (Dollard et al., 2019; Dietz et al., 2020). As Gurt et al. (2011) stated, an organization striving for health promotion must

create a good fit between organizational values and leader behaviors to reach its desired goals.

Through the mechanisms outlined above, we expect the relationship between OHC and employee well-being to be mediated by health-oriented leadership:

> *H3*: OHC (at T1) has a) positive indirect effects on job satisfaction (at T3) and b) negative indirect effects on emotional exhaustion (at T3) by the mediation of health-oriented leadership (at T2).

2.4. The different levels of analysis

Climate perceptions can be conceptualized at different levels: while *psychological climate* ascertains the sense-making process of an individual regarding his or her work environment (i.e., the individual level), the *group-level organizational climate* prescribes the "shared perceptions of employees on organizational policies, practices and procedures" (Loh et al., 2019, p. S. 443). While climate research becomes increasingly conducted at the group level because climate is often viewed as a group-level phenomenon, researchers on psychological climate have expressed the concern that individual differences in climate perceptions might be lost in this approach. This is why a *simultaneous* examination of these processes seems warranted (e.g., Schulz et al., 2017). Through that, organizational researchers gain knowledge of the empirical effect of "a comparison between individual and group levels of climate" (Loh et al., 2019, p. S. 444). Moreover, intergroup dynamics cannot be equalized to processes within groups, and this differentiation reveals different social processes that might take place (intergroup dynamics vs. within-team processes; van Knippenberg, 2003).

The differentiation of levels of analysis makes it possible to consider the grounding of variance in the criterion variables due to between-group effects (i.e., the team) and within-group effects (i.e., individual differences or social processes; Zhang et al., 2009) and provides evidence of which level of analysis is more relevant for the mediating mechanism of health-oriented leadership in the relationship between OHC and employee well-being. In the only study known to us that simultaneously examines within-team and between-team processes regarding OHC, Schulz et al. (2017) found between-team health climate to relate to several employee health outcomes beyond within-team health climate perceptions. Thus, in this study, we explicitly differentiate the mechanisms between and within teams regarding OHC and health-oriented leadership to draw implications for theory and practice as to different relational patterns between levels:

Research Question 1: Is the mediating pathway within teams of different strengths than that between teams?

3. Methods

3.1. Procedure

The data of this study were part of a larger research project on an intervention regarding supportive leadership in childcare centers in Germany. The objectives and usages of other studies of the dataset can be viewed in the supplemental material (Supplementary Table S1).

Invited to the data survey of the research project were leaders of 80 childcare centers and their teams. They had an overarching union, which oversaw the organizations' health management system and steered the information policy regarding health-related topics via several division managers, newsletters and regular staff meetings. Data was gathered by means of a paper-pencil survey where all participants created their own code that allowed us to match individual responses to a team identifier. We collected data at three time points with time lags of 6 months between each data collection.

The leaders of part of the sample (30 leaders of 243 employees) participated in an intervention for supportive leadership training between T1 and T2. We conducted additional analyses to control for differences between the groups whose leaders had participated in the intervention and those whose leaders had not. These analyses gave no evidence of a difference between groups and can be viewed in the supplemental material (Supplementary Table S2).

3.2. Participants

Our final sample comprised 423 employees in 74 teams. From the originally invited 664 employees of 80 teams, 500 participants from 77 teams responded at T1, 362 participants from 74 teams responded at T2, and 321 participants from 70 teams responded at T3, yielding an average attrition rate of 41% over all time points. We excluded participants who (1) were trainees or interns to ensure a close enough working relationship with the leader and organization or (2) could not be matched to a team. We also excluded two teams due to insufficient team size (< 3 members). Team sizes ranged from 3 to 17 participants across all time points, with an average of 6.5. We compared participants who participated at T1 and T2 with those who participated only at T1 regarding OHC, health-oriented leadership, and employee well-being at T1 via t-tests. There were no differences between the subsamples found. We applied the same procedure to those participants who participated at T2 and T3 versus those only participating at T2 regarding the T2 variables. Again, no differences were found.

Due to the study focusing on child care centers, the final sample was 98% female and the participants were 17–65 years old, with 13% nonpedagogical personnel and 77% pedagogical personnel, 50% worked full time, 31% worked part-time with more than 20 h and 18% less than 20 h. The job tenure ranged between 1 and 44 years and employees worked between 1 and 6 years with their leaders.

3.3. Measures

We used questionnaires as the main data collection approach due to previous research pointing to an advantage of this type of data collection approach for the construct types we applied (Vonderlin et al., 2021) and the ease to collect large amounts of data and the feasibility for respondents to participate in the study (Martínez-Navalón et al., 2019).

The used items varied with regard to their type of dimensionality (e.g., agreement-styled dimensions, frequency-styled dimensions, and satisfaction-styled dimensions).

3.3.1. Organizational health climate

We measured OHC perceptions of employees at T1 and T2 via six items that were adapted to the context of social care from Ducki (2000). To make the instrument fitting to the daily language of our context, we added expressions such as "*our union*" instead of "*our organization*" (response format: 5-point scale with 1 = *does not apply at all* to 5 = *applies very often*). A sample item was, "Our union attaches great importance to the well-being and health of its employees."

3.3.2. Health-oriented leadership

We measured health-oriented leadership via follower reports at T1 and T2 and used four behavior- and relationship-oriented items of the health-oriented leadership scale by Franke et al. (2014) with a 5-point answering scale [1 = (almost) never to 5 = (almost) always]. Sample items were, "My supervisor reduces stress through improvements in the area of work organization (e.g., setting priorities, ensuring undisturbed work, daily planning)" and "My supervisor ensures that everyone interacts positively."

3.3.3. Job satisfaction

Follower job satisfaction was assessed with six items from the Copenhagen Psychosocial Questionnaire (Kristensen, 2000) at T1 and T3 with a 5-point answering scale (1 = not at all satisfied to 5 = very satisfied). A sample item was, "In general, how pleased are you with your work?"

3.3.4. Emotional exhaustion

We measured emotional exhaustion with five items from the Maslach Burnout Inventory (Maslach and Jackson, 1981) at T1 and T3. The responses were given on a 6-point scale (1 = never to 6 = often). A sample item was, "I feel burned out from my work."

3.4. Data analyses

3.4.1. Aggregation procedure

We followed the recommendations and practices in the multilevel literature (Mathieu and Luciano, 2019) and calculated several statistics to examine both within- and between-group variance to justify the aggregation of our data. While the literature discusses several ways of how team level measures can be connected to individual perceptions (Chan, 1998), our perspective was that of a direct consensus model, which requires a certain amount of individual agreement of the respective team-level construct. Regarding OHC, a one-way between-group ANOVA showed sufficient between-group variance (F (76, 414) = 1.59, p = 0.003) as well as within-group variability (Newman and Sin, 2020) with an average $r_{wg(j)}$ = 0.73, reaching the recommended threshold of $r_{wg(j)} > 0.70$ (LeBreton and Senter, 2008). An ICC [1] of 0.08 at T1 showed a low but adequate variance between groups for the climate measure (Bliese, 2000). The ICC [2] was .37 at T1 and indicated low reliability; however, one should not refrain from conducting a multilevel analysis due to a low ICC 2 value (e.g., Aguinis et al., 2013). Since we observed both the Level-1 and Level-2 climate in this study and all other values were in the expected direction, we decided to proceed with the aggregation of the climate measure. For leadership, the between-group variance and within-group variability were adequate, indicated by a significant one-way between-group ANOVA (F (76, 408) = 3.36, p = 0.001) and an average $r_{wg(j)}$ = 0.75. An ICC [1] = 0.30 and ICC [2] = 0.71 also indicated moderate variance between groups and good reliability of the group variable.

3.4.2. Analyses of the results

Our data had a nested structure with employees nested in teams. The aggregated team variables (between-team OHC and between-team health-oriented leadership) were measured at Level 2, while job satisfaction and emotional exhaustion of employees and within-team predictors were measured at Level 1.

To reflect the nestedness, and thus, multilevel structure of our data and to test our hypotheses, we used multilevel structural equation modeling (MSEM, Preacher et al., 2011) with a maximum likelihood estimator. The MSEM approach separates within and between components of all variables and, thus, allows for distinct investigation of the direct and indirect effects at each level (Preacher et al., 2011). To test our hypotheses, we specified a 2-2-1 mediation model following the approach outlined by Hofmann and Gavin (1998). We group-mean centered the Level-1 variables and reintroduced the means of those variables back at Level 2. This approach allowed us to separately examine between-and within-group effects. To test indirect effects, we calculated Monte Carlo confidence intervals as recommended by Hayes (2017). Overall, we used the open source software R (R Core Team, 2022) for data management and preprocessing and Mplus (Muthén and Muthén, 1998) for fitting the multilevel models.

4. Results

Descriptive statistics, correlations, and reliabilities can be found in Table 1. All correlations were in the expected direction.

4.1. Results of the multilevel structural equation model

To test our hypotheses, we fitted the model indicated in Figure 2. The model showed a good fit to the data (χ^2 = 8.478, df = 6, p = 0.21, CFI = 0.99, TLI = 0.97, $RMSEA$ = 0.03). The effects of the model can be found in Table 2. As hypothesized, OHC at T1 had a positive effect on health-oriented leadership at T2 and was stronger between teams (γ = 0.34, p = 0.01, CI_{95} [0.08; 0.60]) than within teams (γ = 0.09, p = 0.12, CI_{95} [−0.02; 0.21]). This supports hypothesis H1 at the between-team level.

Health-oriented leadership at T2 was related to job satisfaction at T3 between teams (γ = 0.35, p = 0.001, CI_{95} [0.16; 0.53]) but not within teams (γ = 0.11, p = 0.15, CI_{95} [−0.04; 0.25]) while being negatively related to emotional exhaustion within teams (γ = −0.21, p = 0.007, CI_{95} [−0.35; −0.06]), but not between teams (γ = −0.06, p = 0.63, CI_{95} [−0.31; 0.19]). Thus, hypothesis H2a was supported between 680 teams and H2b was supported within teams.

H3 asked for a mediation effect of OHC on (a) job satisfaction and (b) emotional exhaustion via health-oriented leadership and could only be supported for job satisfaction at the between-team level (γ = 0.12, p = 0.03, CI_{95} [0.01; 0.22]). The indirect within-team mediation effect was nonsignificant (γ = 0.01, p = 0.35, CI_{95} [−0.01; 0.03]). Thus, H3a was supported between teams. For emotional exhaustion, both the indirect between-team effect (γ = −0.02, p = 0.63,

TABLE 1 Means, standard deviations, reliabilities, and correlations.

Variable	*M*	*SD*	1	2	3	4	5	6	7	8
1. OHC (T1)	2.94	0.95	*(0.95)*	0.50**	0.42**	0.39**	−0.51**	−0.39**	0.67**	0.44**
2. OHC (T2)	3.05	0.97	0.66**	*(0.95)*	0.21**	0.29**	−0.36**	−0.26**	0.33**	0.20**
3. HoL (T1)	3.55	0.96	0.38**	0.21*	*(0.86)*	0.72**	−0.44**	−0.09	0.62**	0.43**
4. HoL (T2)	3.57	0.89	0.37**	0.31**	0.66**	*(0.86)*	−0.33**	−0.16**	0.49**	0.42**
5. Exhaustion (T1)	3.56	1.31	−0.57**	−0.48**	−0.36**	−0.34**	*(0.94)*	0.50**	−0.69**	−0.53**
6. Exhaustion (T3)	3.69	1.30	−0.51**	−0.45**	−0.23**	−0.28**	0.79**	*(0.95)*	−0.41**	−0.66**
7. Job satisfaction (T1)	3.69	0.75	0.61**	0.48**	0.49**	0.41**	−0.69**	−0.59**	*(0.91)*	0.62**
8. Job satisfaction (T3)	3.67	0.73	0.53**	0.46**	0.48**	0.47**	−0.64**	−0.66**	0.78**	*(0.93)*

Within-level correlations ($N = 423$ employees) are below the diagonal and between-level correlations (74 teams) are above the diagonal; (ω) are given in parentheses along the diagonal.
*$p < 0.05$, **$p < 0.01$.

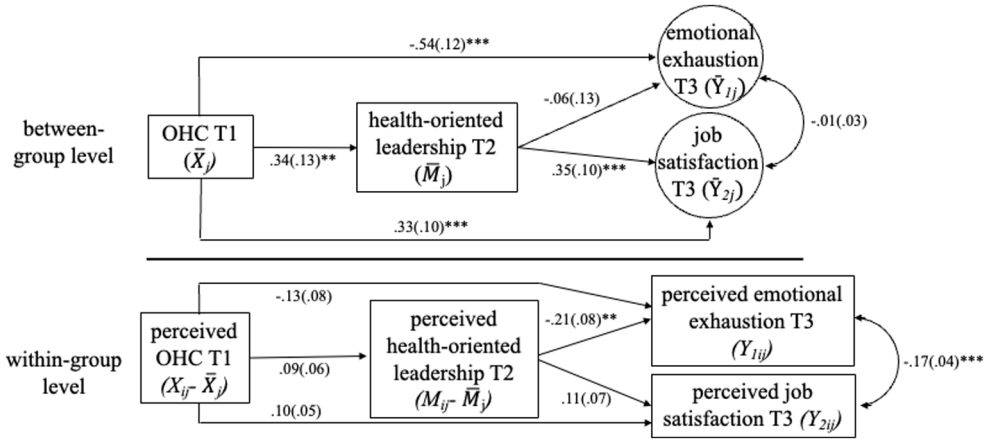

FIGURE 2
Results from the multilevel path model with unstandardized regression coefficients and standard errors in parentheses. Relationships with control variables and autoregressive effects can be viewed in Table 2. *p<0.05, **p<0.01, ***p<0.001.

CI_{95} [−0.10; 0.06]) and the indirect within-team effect were nonsignificant ($\gamma = -0.02$, $p = 0.23$, CI_{95} [−0.05; 0.01]). Thus, H3b could not be supported.

Responding to Research Question 1, the mediation pathway between teams was significantly stronger than that within teams for the outcome of job satisfaction ($Diff_{indJS} = Ind_{JSWithin} - Ind_{JSbetween} = 0.01 - 0.116 = -0.11$, $p = 0.04$, $MCCI_{95}$ [−0.22; −0.01].

5. Discussion

Our study aimed to identify organizational antecedents of health-oriented leadership and to explore the underlying mechanisms of the relationship between OHC and employee well-being in a facet-specific manner within and between teams in a longitudinal multilevel analysis with three measurement points. Our results showed that OHC can be viewed as an antecedent of health-oriented leadership at the between-team level. We also found health-oriented leadership to be an important mechanism by which OHC relates to job satisfaction of employees at the between-team level, with the effect being significantly stronger at the between-team than at the within-team level. We found no mediation effect of health-oriented leadership on the relationship between OHC and emotional exhaustion.

5.1. Theoretical implications

Recent research highlights the importance of examining relationships in their contextual environment (Hobfoll et al., 2018; Inceoglu et al., 2021). The larger organizational context must be considered when seeking to influence (health-oriented) behavior (e.g., Sharma, 2018). Thus, leaders need organizational prerequisites that support their way of leading for them to be effective and supportive. Corroborating this assumption and based on corollary one of the COR theory, hypothesis H1, linking OHC to health-oriented leadership, was supported at the between-team level. Thus, organizational climate functions as a resource for health-oriented leaders and grants them the opportunity to use and distribute those

TABLE 2 Results of the multilevel structural equation models.

				Within/between group			γ(SE)		
Models	−2LL	Δdf	p	σ^2_{HoL}	σ^2_{EE}	σ^2_{JS}	HoL (T2)	EE (T3)	JS (T3)
Unconditional model	1563.85		0.000	0.38/0.37	1.54/0.04	0.42/0.10			
Within:									
a_1-path OHC (T1) → HoL (T2)	1542.76	1	0.000	0.35/0.37	1.54/0.04	0.42/0.10	0.09(0.06)		
c'_1-path OHC (T1) → EE (T3)	1491.52	2	0.000	0.35/0.38	1.27/0.04			−0.13(0.08)	
c'_2-path OHC (T1) → JS (T3)						0.33/0.11			0.10(0.05)
b_1-path HoL (T2) → EE (T3)	1483.62	2	0.000	0.35/0.37	1.23/0.04			−0.21(0.08)**	
b_2-path HoL(T2) → JS (T3)						0.31/0.11			0.11(0.07)
Stabilities:									
HoL (T1)	1293.82	3	0.000	0.30/0.38			0.34(0.06)***		
JS (T1)						0.20/0.11			60(0.05)***
EE (T1)					0.67/0.11			0.65(0.05)***	
Between:									
a_2-path OHC (T1) → HoL (T2)	1288.23	1	0.000	0.30/0.35	0.67/0.11	0.20/0.11	0.34(0.13)**		
c'_3-path OHC (T1) → EE (T3)	1261.87	2	0.000	0.30/0.35	0.66/0.04			−0.54(0.12)***	
c'_4-path OHC (T1) → JS (T3)						0.19/0.06			33(0.10)***
b_3-path HoL (T2) → EE (T3)	1242.09	2	0.000	0.30/0.35	0.66/0.03			−0.06(0.13)	
b_4-path HoL(T2) → JS (T3)						0.20/0.03			0.35(0.10)***
Within indirect effects								γ [$MCCI_{95}$]	
OHC (T1) → HoL (T2) → EE (T3 ; $a_1 \times b_1$)								−0.02[−0.06; 0.003]	
OHC (T1) → HoL (T2) → JS (T3 ; $a_1 \times b_2$)									0.01[−0.003; 0.04]
Between indirect effects									
OHC (T1) → HoL (T2) → EE (T3 ; $a_2 \times b_3$)								−0.02[−0.12;0.07]	
OHC (T1) → HoL (T2) → JS (T3 ; $a_2 \times b_4$)									0.12[0.02;0.23]
Difference test of within and between indirect effects of JS									
Ind. JS within—ind. JS between								−0.11 [−0.22;-0.008]	

OHC = organizational health climate; HoL = health-oriented leadership; EE = employee emotional exhaustion; JS = employee job satisfaction; −2LL = −2*Log-Likelihood; Δdf = change in degrees of freedom; σ^2 = residual variance; and $MCCI_{95}$ = Monte Carlo confidence intervals. Displayed are unstandardized estimates.

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

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gained resources to their teams. Organizational climate thereby links the larger organizational context with the internal functioning of the organization (Dollard et al., 2019). With this finding, we contribute to the existing research by widening the lens to an important precondition of (health-oriented) leadership. This finding also contributes to the discussion of the ordering of the two variables of organizational climate and leadership. While initial research on organizational climate often conceptualized leaders as the creators of organizational climate (e.g., Clarke, 2013), recent research also identified organizational climate to be a plausible, if not necessary, precondition of leader actions (Yulita and Idris, 2017; Biron et al., 2018; Kaluza et al., 2020). Our analysis confirmed these studies and showed that the climate–leadership link is similarly plausible to the leadership–climate link. Future research must reveal if the ordering is reciprocal and if there are facet-specific differences for specific climate and leadership measures.

Our research further revealed that there is a difference in the OHC–health-oriented leadership relationship regarding different levels of analysis. A large share of the variance in health-oriented leadership is explained at the group level, which highlights the meaning of leadership for teams with regard to the conveyance of organizational climate.

In our second hypothesis, we postulated a positive influence of health-oriented leadership on employee well-being. While health-oriented leadership was positively related to job satisfaction at the between-team level, partially supporting H2a, its positive influence on emotional exhaustion (H2b) was only found at the within-team level, partially supporting H2b. The finding hints at the different mechanisms that influence employee well-being at the distinct levels of analysis (Wang and Howell, 2010): While job satisfaction is enhanced by positive influences of the whole team, for example, by improving team processes, appreciating the whole team for good work, or decreasing disruptive job demands for the team (Braun et al., 2013), emotional exhaustion seems to be a very individual perception that is instead based on the personal experience between the leader and the individual team members rather than on a group perception. It is not easy for leaders to consider all team members' higher-level needs equally and, thus, influence their feelings of exhaustion in a similar fashion (Arnold, 2017). Corroborating this, studies have found lower ICCs for mental health than for other variables, suggesting that they are not significantly determined by group membership (Vonderlin et al., 2021). In sum, our differential findings on the different levels of analysis highlight the importance of examining level-specific mechanisms and outcomes.

Our mediation hypothesis regarding OHC and job satisfaction was supported at the between-team level, although not at the within-team level (partially supporting H3a). This finding identifies a group-level mechanism by which climate perceptions influence employee job satisfaction. Previous research showed that organizational factors influence employee behavior by a leader whose behavior is aligned with these organizational factors (Dietz et al., 2020). Thus, health-oriented leadership behaviors are a way through which health-related values and priorities of the organization trickle down to employees (Kaluza et al., 2020). This is in line with COR theory because employees "employ key resources not only to respond to stress but also to build a reservoir of sustaining resources for times of future need" (Hobfoll et al., 2018, p. 104). Thus, the distal organizational resource of OHC enhances the more proximal resource of health-oriented leadership, which creates a resource caravan passageway for employees and, thus, enhances job satisfaction (Hobfoll, 2012).

We further concretized our findings by showing that the mediating mechanism is stronger at the between-team level (answering Research Question 1), which corroborates research by Schulz et al. (2017). Leaders in childcare settings seem to emphasize the consequences and possibilities of OHC for their center, which transfers to employees focusing more on the "we" than the "I," which results in greater job satisfaction, possibly by a higher identification with the work group (Riketta and van Dick, 2005). According to social identity theory (Ashforth and Mael, 1989), job satisfaction increases with the degree of identification with the organization because important human needs are met (van Dick and Haslam, 2012) and because a sharedness of values and norms by the group and shared group behaviors positively enhance individual outcomes (Häusser et al., 2020). This should be even more the case when organizational values and priorities and leadership behaviors are aligned in words and actions (Yulita and Idris, 2017). Individual perceptions in the team seem to fluctuate more easily, contingent upon the overall team atmosphere (Inceoglu et al., 2021).

The reason we did not find a significant mediation effect for emotional exhaustion (not supporting H3b) might have been the relatively high autoregressive effect of emotional exhaustion, indicating great inertia of emotional exhaustion within the measured timeframe (Hamaker and Grasman, 2015) and the already mentioned difficulty of attending to all employees equally in a group. Similar to our findings, Yulita and Idris (2017) found no significant relationship between enacted managerial support and emotional exhaustion. Moreover, previous research has shown that job demands, rather than job resources (such as health-oriented leadership) were the main predictors of emotional exhaustion (Dollard and Bakker, 2010; Dollard et al., 2012a).

5.2. Limitations and implications for future research

The results of our study must be seen in light of several limitations. Despite a multilevel design, which reduces common-method variance (Loh et al., 2019), we had a single-source design. Thus, we cannot rule out that common-method bias inflated the inspected relationships (Podsakoff et al., 2003). Even though one might intuitively point to a leader's self-rated leadership measurement to acquaint a multisource design, previous research has shown that supervisors' self-ratings of health-oriented leadership did not influence the relationship between employee ratings of health-oriented leadership and their mental distress, thus, consciously avoiding a leadership self-rating (Vonderlin et al., 2021). However, it would be valuable to integrate other-rated moderators to control for bias, for example leaders' resources (i.e., skills; Pischel et al., 2022).

Furthermore, in terms of the ordering of the variables, our sample power did not suffice to integrate a cross-lagged panel model. Since previous research found evidence of the leadership–climate link (see Schneider et al., 2017) and the climate–leadership link (e.g., Biron et al., 2018), the direction of effects is not yet certain, and it could well be a reciprocal one. Thus, we need additional research to provide

information on this topic. Future investigations should be especially sensitive to the facet-specificity of climate and leadership when aiming to explore the ordering of the variables (e.g., a leadership climate as a specific climate facet; Chen and Bliese, 2002). Further, OHC should also be examined as a moderator of (health-oriented) leadership as it has been identified in several works examining specific work conditions to identify the boundary conditions of health-oriented leadership (e.g., Dollard and Bakker, 2010; Law et al., 2011; Hall et al., 2013).

For the generalizability of the results, one has to keep in mind the industrial sector and the associated context (Inceoglu et al., 2021). Our study examined childcare centers and, thus, the social care context. However, for generalizability to other contexts, one must consider the potentially different mechanisms of conveying organizational climate and practicing health-oriented leadership in the organization (e.g., different communication patterns and collaboration schemes). Additionally, our sample was, due to the profession, our sample was very female-dominated. Thus, it would be valuable to examine moderators that indicate this gender distribution, for example, work–family conflict (e.g., Cinamon and Rich, 2002).

Furthermore, while we found differing results for the two levels of analysis, we did not test the nature of these differences. Future research should work on identifying the conditions on which these differences are grounded.

5.3. Practical implications

Interventions designed to improve employee mental health often focus on the individual or the personality and skills of the leader and not on organizational factors (Stuber et al., 2021). This circumstance involves the risk of ceiling effects when the skill set of a leader cannot be improved any further (Hammer et al., 2019). Our research provides support for the assumption that the value of employee job satisfaction is anchored in the organizational culture and that this can then be transferred to employees through leader behaviors (Parker et al., 2017; Health-oriented). Leadership behaviors can thereby be trained, as various previous research studies have shown (e.g., Parry and Sinha, 2005; Stein et al., 2021; Stuber et al., 2021). Thus, the organizational antecedents on which leader behavior forms must be considered when planning to influence leader behaviors (Nielsen and Miraglia, 2017).

Furthermore, knowledge about the social processes that influence how OHC and health-oriented leadership are perceived by employees is valuable to decide on the priorities in management behavior. Our research showed that employee job satisfaction is mainly influenced by a shared perception of the team regarding OHC and health-oriented leadership. Thus, addressing the team in a team-oriented way (e.g., providing information to the whole team, making decisions in participatory team meetings, providing transparency for the whole team) would be a good skill set to meet team needs regarding job satisfaction. At the same time, our study showed that impaired well-being (i.e., emotional exhaustion) cannot be influenced via health-oriented leadership at the team level. Thus, leaders can react more precisely to the needs of the team when they have a precise goal and familiar knowledge about the mechanisms by which OHC and health-oriented leadership are conveyed to reach this goal.

6. Conclusion

By identifying OHC as an organizational antecedent of health-oriented leadership, this study illustrates the relevance of organizational preconditions for the effective functioning of (health-oriented) leadership. This finding complements other research works that have identified the context as a notable part of leadership research (Oc, 2018; Sharma, 2018) and encourages research and practitioners to not solely focus on the outcomes of leadership but to also incorporate the "other side of the equation." The study also showed that the relationship between OHC and job satisfaction is coming to life via health-oriented leadership and a team-based pathway, which gives organizations cues as to how to distribute OHC throughout the organizational environment. While research is starting to differentiate levels of analysis with greater frequency, the findings of this study encourage to a more consequent examination of multiple levels; otherwise, important knowledge on relationship patterns may be masked.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors upon request, with undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by Institutional Review Board of the University of Hamburg. The patients/participants provided their written informed consent to participate in this study.

Author contributions

FT, HS, and KK contributed to the conception and design of the study. FT organized the database, performed the statistical analysis, and wrote the first draft of the manuscript. 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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Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1181599/full#supplementary-material

References

Aguinis, H., Gottfredson, R. K., and Culpepper, S. A. (2013). Best-practice recommendations for estimating cross-level interaction effects using multilevel modeling. *J. Manag.* 39, 1490–1528. doi: 10.1177/0149206313478188

Ajzen, I. (1985). *From Intentions to Actions: A Theory of Planned Behavior*. Springer Berlin Heidelberg.

Alilyyani, B., Wong, C. A., and Cummings, G. (2018). Antecedents, mediators, and outcomes of authentic leadership in healthcare: a systematic review. *Int. J. Nurs. Stud.* 83, 34–64. doi: 10.1016/j.ijnurstu.2018.04.001

Argyris, C., and Schön, D. A. (1974). *Theory in Practice: Increasing Professional Effectiveness*. Oxford, UK: Jossey-Bass.

Arnold, K. A. (2017). Transformational leadership and employee psychological well-being: a review and directions for future research. *J. Occup. Health Psychol.* 22, 381–393. doi: 10.1037/ocp0000062

Arnold, M., and Rigotti, T. (2020). The leader in the spotlight: health-oriented leadership and its antecedents and outcomes. *Acad. Manag. Proc.* 2020:16724. doi: 10.5465/AMBPP.2020.16724abstract

Ashforth, B. E., and Mael, F. (1989). Social identity theory and the organization. *Acad. Manag. Rev.* 14, 20–39. doi: 10.2307/258189

Biron, C., Parent-Lamarche, A., Ivers, H., and Baril-Gingras, G. (2018). Do as you say: the effects of psychosocial safety climate on managerial quality in an organizational health intervention. *Int. J. Workplace Health Manag.* 11, 228–244. doi: 10.1108/IJWHM-01-2018-0009

Blau, P. (1964). *Power and Exchange in Social Life*. NY, USA: John Wiley & Sons.

Bliese, P. D. (2000). "Within-group agreement, non-independence, and reliability: implications for data aggregation and analysis" in *Multilevel Theory, Research, and Methods in Organizations: Foundations, Extensions, and New Directions*. eds. K. J. Klein and S. W. J. Kozlowski (San Francisco, CA: Jossey-Bass), 349–381.

Braun, S., Peus, C., Weisweiler, S., and Frey, D. (2013). Transformational leadership, job satisfaction, and team performance: a multilevel mediation model of trust. *Leadersh. Q.* 24, 270–283. doi: 10.1016/j.leaqua.2012.11.006

Brenscheidt, S., Siefer, A., Hünefeld, L., Backhaus, N., and Halke, T.. (2022). Arbeitswelt im Wandel Zahlen–Daten–Fakten Ausgabe 2022 [Changing world of work; numbers—Dates—Facts; edition 2022]. Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (BAuA). 1–86. Available at: https://www.baua.de/DE/Angebote/Publikationen/Praxis/A107.html

Chan, D. (1998). Functional relations among constructs in the same content domain at different levels of analysis: a typology of composition models. *J. Appl. Psychol.* 83, 234–246. doi: 10.1037/0021-9010.83.2.234

Chen, G., and Bliese, P. D. (2002). The role of different levels of leadership in predicting self- and collective efficacy: evidence for discontinuity. *J. Appl. Psychol.* 87, 549–556. doi: 10.1037/0021-9010.87.3.549

Cinamon, R. G., and Rich, Y. (2002). *Gender Differences in the Importance of Work and Family Roles: Implications for Work–family Conflict*. Sex Roles 47, 531–541. doi: 10.1023/A:1022021804846

Clarke, S. (2006). The relationship between safety climate and safety performance: a meta-analytic review. *J. Occup. Health Psychol.* 11, 315–327. doi: 10.1037/1076-8998.11.4.315

Clarke, S. (2013). Safety leadership: a meta-analytic review of transformational and transactional leadership styles as antecedents of safety behaviours. *J. Occup. Organ. Psychol.* 86, 22–49. doi: 10.1111/j.2044-8325.2012.02064.x

Courtright, S. H., Gardner, R. G., Smith, T. A., McCormick, B. W., and Colbert, A. E. (2016). My family made me do it: a cross-domain, self-regulatory perspective on antecedents to abusive supervision. *Acad. Manag. J.* 59, 1630–1652. doi: 10.5465/amj.2013.1009

de Jonge, J., and Dormann, C. (2017). "Why is my job so stressful? Characteristics, processes, and models of stress at work" in *An Introduction to Work and Organizational Psychology: An International Perspective*. eds. N. Chmiel, F. Fraccaroli and M. Sverke. *3rd* ed (Chichester, West Sussex, UK: John Wiley & Sons, Ltd.), 80–101.

Dietz, C., Zacher, H., Scheel, T., Otto, K., and Rigotti, T. (2020). Leaders as role models: effects of leader presenteeism on employee presenteeism and sick leave. *Work Stress* 34, 300–322. doi: 10.1080/02678373.2020.1728420

Dimoff, J. K., and Kelloway, E. K. (2017). "Leaders as resources: how managers and supervisors can socially support employees towards better mental health and wellbeing" in *Leading to Occupational Health and Safety*. eds. E. K. Kelloway, K. Nielsen and J. K. Dimoff (Chichester, West Sussex, UK: Wiley Blackwell), 149–162.

Dollard, M. F., and Bakker, A. B. (2010). Psychosocial safety climate as a precursor to conducive work environments, psychological health problems, and employee engagement. *J. Occup. Organ. Psychol.* 83, 579–599. doi: 10.1348/096317909X470690

Dollard, M. F., Dormann, C., and Idris, M. A. (2019). "Psychosocial safety climate: a new work stress theory and implications for method" in *Psychosocial Safety Climate—A New Work Stress Theory* (Cham, Switzerland: Springer Nature Switzerland AG), 3–30.

Dollard, M. F., Opie, T., Lenthall, S., Wakerman, J., Knight, S., Dunn, S., et al. (2012a). Psychosocial safety climate as an antecedent of work characteristics and psychological strain: a multilevel model. *Work Stress* 26, 385–404. doi: 10.1080/02678373.2012.734154

Dollard, M. F., Tuckey, M. R., and Dormann, C. (2012b). Psychosocial safety climate moderates the job demand–resource interaction in predicting workgroup distress. *Accid. Anal. Prev.* 45, 694–704. doi: 10.1016/j.aap.2011.09.042

Ducki, A. (2000). *Diagnose gesundheitsförderlicher Arbeit. Eine Gesamtstrategie zur betrieblichen Gesundheitsanalyse [Diagnosis of health-promoting work. A holistic strategy of an occupational health-analysis]*. Zurich, Switzerland: vdf Hochschulverlag.

Franke, F., Felfe, J., and Pundt, A. (2014). The impact of health-oriented leadership on follower health: development and test of a new instrument measuring health-promoting leadership. *German J Hum Resour Manag* 28, 139–161. doi: 10.1177/239700221402800108

Gorgievski, M. J., and Hobfoll, S. E. (2008). "Work can burn us out or fire us up: conservation of resources in burnout and engagement" in *Handbook of Stress and Burnout in Health Care*. (Hauppauge, NY: Nova Science Publishers).

Gurt, J., Schwennen, C., and Elke, G. (2011). Health-specific leadership: is there an association between leader consideration for the health of employees and their strain and well-being? *Work Stress* 25, 108–127. doi: 10.1080/02678373.2011.595947

Hall, G. B., Dollard, M. F., Winefield, A. H., Dormann, C., and Bakker, A. B. (2013). Psychosocial safety climate buffers effects of job demands on depression and positive organizational behaviors. *Anxiety Stress Coping* 26, 355–377. doi: 10.1080/10615806.2012.700477

Hamaker, E. L., and Grasman, R. P. P. P. (2015). To center or not to center? Investigating inertia with a multilevel autoregressive model. *Front. Psychol.* 5, 1–15. doi: 10.3389/fpsyg.2014.01492

Hammer, L. B., Truxillo, D. M., Bodner, T., Pytlovany, A. C., and Richman, A. (2019). Exploration of the impact of organisational context on a workplace safety and health intervention. *Work Stress* 33, 192–210. doi: 10.1080/02678373.2018.1496159

Hauff, S., Krick, A., Klebe, L., and Felfe, J. (2022). High-performance work practices and employee wellbeing—does health-oriented leadership make a difference? *Front. Psychol.* 13:833028. doi: 10.3389/fpsyg.2022.833028

Häusser, J. A., Junker, N. M., and Dick, R. (2020). The how and the when of the social cure: a conceptual model of group- and individual-level mechanisms linking social identity to health and well-being. *Eur. J. Soc. Psychol.* 50, 721–732. doi: 10.1002/ejsp.2668

Hayes, A. F. (2017). *Introduction to Mediation, Moderation, and Conditional Process Analysis—A Regression-based Approach*. NY, USA: Guilford Press.

Hobfoll, S. E. (1989). Conservation of resources: a new attempt at conceptualizing stress. *Am. Psychol.* 44, 513–524. doi: 10.1037/0003-066X.44.3.513

Hobfoll, S. E. (2012). Conservation of resources and disaster in cultural context: the caravans and passageways for resources. *Psychiatry* 75, 227–232. doi: 10.1521/psyc.2012.75.3.227

Hobfoll, S. E., Halbesleben, J., Neveu, J.-P., and Westman, M. (2018). Conservation of resources in the organizational context: the reality of resources and their consequences. *Annu. Rev. Organ. Psych. Organ. Behav.* 5, 103–128. doi: 10.1146/annurev-orgpsych-032117-104640

Hofmann, D. A., and Gavin, M. B. (1998). Centering decisions in hierarchical linear models: implications for research in organizations. *J. Manag.* 24, 623–641. doi: 10.1177/014920639802400504

Horstmann, D. (2018). Enhancing employee self-care: the moderating effect of personal initiative on health-specific leadership. *Eur. J. Health Psychol.* 25, 96–106. doi: 10.1027/2512-8442/a000014

Inceoglu, I., Arnold, K. A., Leroy, H., Lang, J. W. B., and Stephan, U. (2021). From microscopic to macroscopic perspectives and back: the study of leadership and health/well-being. *J. Occup. Health Psychol.* 26, 459–468. doi: 10.1037/ocp0000316

Kaluza, A. J., Schuh, S. C., Kern, M., Xin, K., and Dick, R. (2020). How do leaders' perceptions of organizational health climate shape employee exhaustion and engagement? Toward a cascading-effects model. *Hum. Resour. Manag.* 59, 359–377. doi: 10.1002/hrm.22000

Kaluza, A. J., Weber, F., van Dick, R., and Junker, N. M. (2021). When and how health-oriented leadership relates to employee well-being—the role of expectations, self-care, and LMX. *J. Appl. Soc. Psychol.* 51, 404–424. doi: 10.1111/jasp.12744

Klug, K., Felfe, J., and Krick, A. (2019). Caring for oneself or for others? How consistent and inconsistent profiles of health-oriented leadership are related to follower strain and health. *Front. Psychol.* 10:2456. doi: 10.3389/fpsyg.2019.02456

Klug, K., Felfe, J., and Krick, A. (2022). Does self-care make you a better leader? A multisource study linking leader self-care to health-oriented leadership, employee self-care, and health. *Int. J. Environ. Res. Public Health* 19:6733. doi: 10.3390/ijerph19116733

Kordt, M. (2014). Gesundheitsreport 2014. Die Rushhour des Lebens. Gesundheit im Spannungsfeld von Job, Karriere und Familie. (DAK-Gesundheitsreport 2014, pp. S. 1–157). DAK Forschung.

Krick, A., Felfe, J., Hauff, S., and Renner, K.-H. (2022). Facilitating health-oriented leadership from a Leader's perspective: antecedents at the organizational, workplace, and individual level. *German J. Work Org. Psychol.* 66, 213–225. doi: 10.1026/0932-4089/a000397

Kristensen, T. S. (2000). *A New Tool for Assessing Psychosocial Factors at Work: The Copenhagen Psychosocial Questionnaire*. Copenagen, Denmark: National Institute for Health.

Law, R., Dollard, M. F., Tuckey, M. R., and Dormann, C. (2011). Psychosocial safety climate as a lead indicator of workplace bullying and harassment, job resources, psychological health and employee engagement. *Accid. Anal. Prev.* 43, 1782–1793. doi: 10.1016/j.aap.2011.04.010

LeBreton, J. M., and Senter, J. L. (2008). Answers to 20 questions about interrater reliability and interrater agreement. *Organ. Res. Methods* 11, 815–852. doi: 10.1177/1094428106296642

Loh, M. Y., Dollard, M. F., McLinton, S. S., and Tuckey, M. R. (2021). How psychosocial safety climate (PSC) gets stronger over time: a first look at leadership and climate strength. *J. Occup. Health Psychol.* 26, 522–536. doi: 10.1037/ocp0000308

Loh, M. Y., Idris, M. A., Dormann, C., and Muhamad, H. (2019). Organisational climate and employee health outcomes: a systematic review. *Saf. Sci.* 118, 442–452. doi: 10.1016/j.ssci.2019.05.052

Martínez-Navalón, J. G., Gelashvili, V., and Debasa, F. (2019). The impact of restaurant social media on environmental sustainability: an empirical study. *Sustainability* 11:6105. doi: 10.3390/su11216105

Maslach, C., and Jackson, S. E. (1981). The measurement of experienced burnout. *J. Organ. Behav.* 2, 99–113. doi: 10.1002/job.4030020205

Mathieu, J. E., and Luciano, M. M. (2019). "Multilevel emergence in work collectives" in *The Handbook of Multilevel Theory, Measurement, and Analysis*. eds. S. E. Humphrey and J. M. LeBreton (Washington, USA: American Psychological Association), S.163–S.186.

Montano, D., Reeske, A., Franke, F., and Hüffmeier, J. (2017). Leadership, followers' mental health and job performance in organizations: a comprehensive meta-analysis from an occupational health perspective: leadership and followers' mental health. *J. Organ. Behav.* 38, 327–350. doi: 10.1002/job.2124

Muthén, L. K., and Muthén, B. O. (1998). *Mplus User's Guide*. (*8th*). Los Angeles, CA: Muthén & Muthén.

Newman, D. A., and Sin, H.-P. (2020). Within-group agreement (r_{WG}): two theoretical parameters and their estimators. *Organ. Res. Methods* 23, 30–64. doi: 10.1177/1094428118809504

Nielsen, K., and Miraglia, M. (2017). What works for whom in which circumstances? On the need to move beyond the 'what works?' Question in organizational intervention research. *Hum. Relat.* 70, 40–62. doi: 10.1177/0018726716670226

Nielsen, K., and Taris, T. W. (2019). Leading well: challenges to researching leadership in occupational health psychology—and some ways forward. *Work Stress* 33, 107–118. doi: 10.1080/02678373.2019.1592263

Oc, B. (2018). Contextual leadership: a systematic review of how contextual factors shape leadership and its outcomes. *Leadersh. Q.* 29, 218–235. doi: 10.1016/j.leaqua.2017.12.004

Parker, S. K., Van den Broeck, A., and Holman, D. (2017). Work design influences: a synthesis of multilevel factors that affect the design of jobs. *Acad. Manag. Ann.* 11, 267–308. doi: 10.5465/annals.2014.0054

Parry, K. W., and Sinha, P. N. (2005). Researching the trainability of transformational organizational leadership. *Hum. Resour. Dev. Int.* 8, 165–183. doi: 10.1080/13678860500100186

Pischel, S., Felfe, J., and Klebe, L. (2022). Should I further engage in staff care?: employees' disclosure, leaders' skills and goal conflict as antecedents of health-oriented leadership. *Int. J. Environ. Res. Public Health* 20:162. doi: 10.3390/ijerph20010162

Podsakoff, P. M., Mac Kenzie, S. B., Lee, J.-Y., and Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *J. Appl. Psychol.* 88, 879–903. doi: 10.1037/0021-9010.88.5.879

Preacher, K. J., Zhang, Z., and Zyphur, M. J. (2011). Alternative methods for assessing mediation in multilevel data: the advantages of multilevel SEM. *Struct. Equ. Model. Multidiscip. J.* 18, 161–182. doi: 10.1080/10705511.2011.557329

R Core Team (2022). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. Available at: https://www.R-project.org/

Riketta, M., and van Dick, R. (2005). Foci of attachment in organizations: a meta-analytic comparison of the strength and correlates of workgroup versus organizational identification and commitment. *J. Vocat. Behav.* 67, 490–510. doi: 10.1016/j.jvb.2004.06.001

Santa Maria, A., Wolter, C., Gusy, B., Kleiber, D., and Renneberg, B. (2019). The impact of health-oriented leadership on police officers' physical health, burnout, depression and well-being. *Policing* 13, 186–200. doi: 10.1093/police/pay067

Schneider, B., Gonzáles-Romá, V., Ostroff, C., and West, M. A. (2017). Organizational climate and culture: reflections on the history of the constructs in the journal of applied psychology. *J. Appl. Psychol.* 102, 468–482. doi: 10.1037/apl0000090

Schulz, H., Zacher, H., and Lippke, S. (2017). The importance of team health climate for health-related outcomes of white-collar workers. *Front. Psychol.* 8, 1–14. doi: 10.3389/fpsyg.2017.00074

Sharma, P. N. (2018). Moving beyond the employee: the role of the organizational context in leader workplace aggression. *Leadersh. Q.* 29, 203–217. doi: 10.1016/j.leaqua.2017.12.002

Sonnentag, S., and Frese, M. (2002). "Stress in organizations" in *Comprehensive Handbook of Psychology: Industrial and Organizational Psychology*. eds. C. Bormann, D. R. Ilgen and R. Klimoski (Hoboken, NJ, USA: Wiley), S 453–S 491.

Stein, M., Schümann, M., Teetzen, F., Gregersen, S., Begemann, V., and Vincent-Höper, S. (2021). Supportive leadership training effects on employee social and hedonic well-being: a cluster randomized controlled trial. *J. Occup. Health Psychol.* 26, 599–612. doi: 10.1037/ocp0000300

Stuber, F., Seifried-Dübon, T., Rieger, M. A., Gündel, H., Ruhle, S., Zipfel, S., et al. (2021). The effectiveness of health-oriented leadership interventions for the improvement of mental health of employees in the health care sector: a systematic review. *Int. Arch. Occup. Environ. Health* 94, 203–220. doi: 10.1007/s00420-020-01583-w

Tafvelin, S., Isaksson, K., and Westerberg, K. (2018). The first year of service: a longitudinal study of Organisational antecedents of transformational leadership in the social service Organisations. *Br. J. Soc. Work* 48, 430–448. doi: 10.1093/bjsw/bcx038

Teetzen, F., Bürkner, P.-C., Gregersen, S., and Vincent-Höper, S. (2022). The mediating effects of work characteristics on the relationship between transformational leadership and employee well-being: a Meta-analytic investigation. *Int. J. Environ. Res. Public Health* 19:3133. doi: 10.3390/ijerph19053133

Tuncdogan, A., Acar, O. A., and Stam, D. (2017). Individual differences as antecedents of leader behavior: towards an understanding of multi-level outcomes. *Leadersh. Q.* 28, 40–64. doi: 10.1016/j.leaqua.2016.10.011

Turgut, S., Schlachter, S., Michel, A., and Sonntag, K. (2020). Antecedents of health-promoting leadership and workload as moderator. *J Leadersh Organ Stud* 27, 203–214. doi: 10.1177/1548051819848988

van Dick, R., and Haslam, S. A. (2012). "Stress and well-being in the workplace: support for key propositions from the social identity approach" in *The Social Cure: Identity, Health, and Well-being*. eds. J. Jetten, C. Haslam and S. A. Haslam (London & New York: Psychology Press/Routledge), S.175–S.194.

van Knippenberg, D. (2003). Intergroup relations in organizations. M. A. In and D. Tjosvold West, & Smith, K. G. *International Handbook of Organizational Teamwork and Cooperative Working* S.381–399. Chichester, West Sussex, UK: John Wiley & Sons, Inc.

Vincent-Höper, S., and Stein, M. (2019). The role of leaders in designing employees' work characteristics: validation of the health- and development-promoting leadership behavior questionnaire. *Front. Psychol.* 10: 1049. doi: 10.3389/fpsyg.2019.01049

Vonderlin, R., Schmidt, B., Müller, G., Biermann, M., Kleindienst, N., Bohus, M., et al. (2021). Health-oriented leadership and mental health from supervisor and employee perspectives: a multilevel and multisource approach. *Front. Psychol.* 11:614803. doi: 10.3389/fpsyg.2020.614803

Wang, X.-H., and Howell, J. M. (2010). Exploring the dual-level effects of transformational leadership on followers. *J. Appl. Psychol.* 95, 1134–1144. doi: 10.1037/a0020754

Wegge, J., Shemla, M., and Haslam, S. A. (2014). Leader behavior as a determinant of health at work: specification and evidence of five key pathways. *German J Hum Resour Manag* 28, 6–23. doi: 10.1177/239700221402800102

Yulita, D. M. F., and Idris, M. A. (2017). Climate congruence: how espoused psychosocial safety climate and enacted managerial support affect emotional exhaustion and work engagement. *Saf. Sci.* 96, 132–142. doi: 10.1016/j.ssci.2017.03.023

Zhang, Z., Zyphur, M. J., and Preacher, K. J. (2009). Testing multilevel mediation using hierarchical linear models: problems and solutions. *Organ. Res. Methods* 12, 695–719. doi: 10.1177/1094428108327450

Zohar, D. (2010). Thirty years of safety climate research: reflections and future directions. *Accid. Anal. Prev.* 42, 1517–1522. doi: 10.1016/j.aap.2009.12.019

Zohar, D., and Luria, G. (2005). A multilevel model of safety climate: cross-level relationships between organization and group-level climates. *J. Appl. Psychol.* 90, 616–628. doi: 10.1037/0021-9010.90.4.616

Zweber, Z. M., Henning, R. A., and Magley, V. J. (2016). A practical scale for multi-faceted organizational health climate assessment. *J. Occup. Health Psychol.* 21, 250–259. doi: 10.1037/a0039895

Zweber, Z. M., Henning, R. A., Magley, V. J., and Faghri, P. (2015). Considering the differential impact of three facets of organizational health climate on employees' well-being. *Sci. World J.* 2015, 1–10. doi: 10.1155/2015/407232

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Dynamics of organizational climate and job satisfaction in healthcare service practice and research: a protocol for a systematic review

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Organizational climate and job satisfaction have been established as fundamental pillars of research and practice in organizational behavior and organizational psychology, inspiring many explanations and operationalizations over time. In most sectors, global trends such as labor shortages, high rates of turnover and absenteeism, the need to increase productivity, and the interest in new work models concur to keep climate and job satisfaction on top of the research agenda. The situation is particularly acute in the healthcare sector, where related factors have the capacity to influence all aspects of care provision, including patient safety and the physical and mental health of care providers. Nevertheless, a gap in knowledge persists regarding climate, job satisfaction, and their relationships in healthcare services. This protocol describes a study that aims to examine the dynamics of climate and job satisfaction in healthcare organizations from the practice and research perspectives. The protocol complies with PRISMA-P. PRISMA will be used to report the results of the study. Databases will be searched for published studies in May 2023, and we expect to complete the study by December 2024. A framework based on a multi-dimensional concept of quality in research will be used to examine the quality of any studies before inclusion. The results will be disseminated in two systematic reviews. We will describe proposed models depicting the dynamics of climate and job satisfaction in healthcare organizations. We will systematize and discuss available evidence regarding the outcomes of climate and job satisfaction in healthcare work environments. We will synthesize information on research designs and methodological options of included studies. We will identify measures of climate and job satisfaction used in healthcare settings, assess their psychometric properties, and appraise the overall quality of underlying studies. Finally, we expect to identify areas in need of further research.

KEYWORDS

organizational climate, job satisfaction, systematic review, protocol, healthcare services, PICCO, health care professionals, health care organizations

1. Introduction

1.1. Overview of climate research origins and evolution

Organizational climate, widely understood as employees' shared perceptions of organizational events, practices, and procedures (Patterson et al., 2005; James et al., 2008; Schneider et al., 2013; Pomirleanu et al., 2022), is central to organizational behavior theory and practice. As a variable positioned between the context of an organization and the

behavior of its members, the organizational climate would provide a way to understand how employees experience their organizations (James et al., 2008; Ryu et al., 2020).

The original study by Lawrence R. James (1943–2014) and colleagues distinguishes between psychological climate and organizational climate (Sleutel, 2000; Parker et al., 2003; James et al., 2008). The fact is, while current research is more focused on aggregate rather than on psychological climate (Schneider et al., 2000; Patterson et al., 2005; D'Amato, 2023), perceptions are formed at the individual level, where work environments are cognitively apprehended, represented, and appraised, in terms of their meaning to and importance for individual employees in organizations (James and Jones, 1974; James and Sells, 1981). The meanings imputed to work environmental attributes would be "phenomenological experiences, which is to say that they are cognitive constructions designed to interpret information sensed from the work environment," while comparing to previously stored mental representations or schemas.

A bias toward the descriptive meaning of work environmental attributes was common in research work in cognitive science and experimental social psychology. However, the fact that measures of situational antecedents in climate research involve perception by individuals would bring forward an issue of individual assessment, not intrinsic to the definition of a particular variable, driving the research agenda toward "subjective interpretations of environmental attributes" (James et al., 2008, p. 9) and rising issues of evaluative and affective meaning, far beyond descriptive initiatives. As argued in a previous research (Patterson et al., 2004, p. 195), "Description and affect are (…) likely to be combined in responses to at least some climate items."

Based on previous research identifying four latent factors representing the most important personal, work-related values (Locke, 1976), four distinct domains of roles, jobs, leaders, and work groups have been consistently proposed as first-order dimensions of psychological climate. As organizational research often involves multiple levels of analysis, a composition theory for climate has been proposed (James, 1982) and models available in the literature (Chan, 1998) were applied to this field (Dawson et al., 2008; Wallace et al., 2013; Zacher and Yang, 2016). It has been suggested (Schneider et al., 2011) that, absent from group-level assessment, one cannot conclude that measures of organizational climate truly reflect the properties of a group, making it irrelevant for practical improvements in an organization. Aggregation depends on agreement on measures of psychological climate perceptions, and different indices have been developed to measure interrater agreement (Cardona Echeverri and Zambrano Cruz, 2014; Hsiung et al., 2020; Powell et al., 2021).

The impact of organizational climate on individual outcomes (Gershon et al., 2007; Clarke et al., 2011; Thompson and Rose, 2011; von Treuer et al., 2014; Loh et al., 2019), organizational outcomes (Patterson et al., 2004, 2005; Berberoglu, 2018), and healthcare outcomes (MacDavitt et al., 2007; Roch et al., 2014) is well documented in the literature, either by using mean psychological climate scores or other statistical functions of psychological climate scores, such as climate strength (Schneider et al., 2002, 2013; Afsharian et al., 2018) and climate quality (Lindell and Brandt, 2000) as mediators of antecedents and outcomes. Many times, perceptions of dimensions of work or workplace environment are investigated as determinants of individual outcomes (Zhenjing et al., 2022), without a reference to organizational climate as a concept. Very frequently, the climate is investigated as an antecedent of burnout (Thompson and Rose, 2011; Junça-Silva and Freire, 2022) and physical and psychological problems of healthcare personnel (Gershon et al., 2007; Loh et al., 2019), with increase in the literature after the health emergency caused by COVID-19 (Penconek et al., 2021).

Overtime, the concept of organizational climate has been established as one of the pillars of organizational behavior and has inspired many explanations and operationalizations, yet with few well-achieved validations of measures of the construct (Patterson et al., 2005; Poghosyan et al., 2013). Moreover, in the healthcare sector, there are not many studies on the subject, and there is a gap in knowledge that it is important to analyze and fulfill with further research.

1.2. Job satisfaction in research and practice

Job satisfaction may be defined as "a pleasure or positive emotional state resulting from the appraisal of one's job or job experience" (Locke, 1976).

Five main theoretical approaches have been proposed to explain job satisfaction (Campbell et al., 1982), while the antecedents of job satisfaction have also been the object of competing theories (Baker, 2004). The range of affect theory (Locke, 1976) is perhaps the most famous job satisfaction model. The main assumption is that satisfaction is determined by a discrepancy between what one seeks in a job and what one gets from that job, and the value given to a specific facet of work would moderate the level of satisfaction achieved. The task characteristics approach (Hackman and Oldman, 2007) posits that task characteristics are related to employee attitudes, and recent studies seem to support a direct impact on job satisfaction (Bhuian and Menguc, 2002). The social information processing approach (Salancik and Pfeffer, 1978) holds that social cues processed from the work environment determine job attitudes; supervision and leadership styles or behaviors, for example, might have an impact on job satisfaction (de Vries et al., 1998). The dispositional theory defends that the individual possesses relatively stable unobservable mental states such as needs or attitudes that will impact their perceptions and behaviors (Staw and Cohen-Charash, 2005, p. 73). Traits would significantly influence their affective and behavioral reactions to organizational settings (Davis-Blake and Pfeffer, 1989), and individuals would process information in such a way to be consistent with their internal states. An integrated approach (Griffin et al., 1987) suggests that job enrichment and social cues combine to influence perceptions and attitudes.

Job satisfaction is usually understood as a global concept comprising various facets (Penconek et al., 2021; Tenaw et al., 2021), with research designs and measurement scales being proposed accordingly. Nevertheless, some argue that the so-called facets of job satisfaction are simply evaluations that individuals make about their work environment and that positioning job satisfaction as the result of an evaluation mediated by affect and

beliefs calls into question the facet vs. global satisfaction distinction (Rafferty and Griffin, 2009).

Categorizations of job satisfaction outcomes include work-related aspects, labor market experiences, physical and mental health, social costs, and other attitudes. The turnover rate has been the most consistent measure to be associated with job satisfaction (Campbell et al., 1982; Mertala et al., 2022), but the relationship seems to be moderated by turnover intention, defined as conscious willfulness to seek other alternative job opportunities in other organizations (Campbell et al., 1982; Lambert et al., 2001). A great number of studies have also suggested a relationship between job satisfaction and the health of workers, a link confirmed by a meta-analysis of 485 studies with a combined sample size of 267.995 individuals (Faragher et al., 2005).

Research designs addressing job satisfaction range from qualitative and quasi-experimental field studies in early research to more recent studies using experience sampling methodologies to deal with intraindividual processes, while emphasizing the role of affect in job satisfaction and that affective reactions are unstable, yet the most common methodologies involve the use of questionnaires, with a diversity of measures available, including graphic measures (Rafferty and Griffin, 2009). A new domain of possibilities regarding the role and the importance of job satisfaction opens with studies incorporating job satisfaction in multilevel processes involving teams and organizations. In this line, previous research showed that aggregate job satisfaction mediated the link between a company's organizational climate and objective measures of company performance (Patterson et al., 2004).

Some argue that there is little consistency in the use of job satisfaction measures (Rafferty and Griffin, 2009). In the health sector, a systematic review (van Saane et al., 2003) aiming to select job satisfaction instruments of adequate reliability and validity to be used as assessment tools in hospital environments has found 11 work factors that might form the basis of the job satisfaction concept; only seven of the analyzed instruments met the reliability and validity criteria defined, and only four addressed job satisfaction of health professionals.

Concerning data analysis procedures, it has been highlighted that most empirical studies addressing job satisfaction, especially in healthcare settings, rely on descriptive statistics, analysis of variance, correlation, or regression analysis, with few attempts at using comprehensive models supported by a simultaneous test of hypotheses (Santana and Loureiro, 2019).

In the healthcare sector, global trends concur to keep job satisfaction as a hot topic on the research agenda. The escalation in healthcare costs calls for interventions aiming at increasing productivity and overall performance, aspects that have been connected to job satisfaction, both directly and indirectly (Kontodimopoulos et al., 2009; Pillay, 2009). High turnover rates, presenteeism and absenteeism (Rantanen and Tuominen, 2011; Belita et al., 2013), and persistent professional shortages increase concerns regarding recruitment, training, and retention of specialized staff, both in developed and developing countries (Fang, 2001; Bodur, 2002; Taunton et al., 2004; Lu et al., 2005; Arab et al., 2007; Coomber and Louise Barriball, 2007; Qian and Lim, 2008; Pillay, 2009; Shi et al., 2023). Patient safety (Haas et al., 2000; Rathert and May, 2007), patient satisfaction (Haas et al., 2000), and the total quality of health services (Bodur, 2002) may be jeopardized by dissatisfied staff (Pillay, 2009).

Nevertheless, several limitations have also been reported by systematic reviews regarding research on job satisfaction in healthcare organizations, including the inconsistent use of concepts and terminology, the heterogeneity of measures used and the quality of related studies (van Saane et al., 2003; Amiresmaili and Moosazadeh, 2013; Chen et al., 2022), and the lack of studies addressing specific health settings such as long-term care (Lee et al., 2020).

1.3. Bridging organizational climate and job satisfaction

Adding to the discussion on the relationship between psychological climate and affective response, three alternative models of the causal relationship between psychological climate and job satisfaction were proposed and tested (James and Tetrick, 1986; James et al., 2008). Subsequent studies (Mathieu et al., 1993) provided further support for a reciprocal model, where psychological climate appears to mediate the relationship between the work environment and affective reactions to that environment. Individuals' valuations of the work environment would elicit affective responses, and those affective responses would then influence the individuals' valuations of the environment, in the light of their beliefs and expectations. Other studies showed that there is substantial empirical overlap between some aspects of organizational climate and job satisfaction but concluded that organizational climate and job satisfaction are distinct concepts, even if "evaluative judgments cannot always be excluded from the measurement of climate" (Patterson et al., 2004, p. 213).

Recent empirical research investigated organizational climate as a determinant of job satisfaction (Tsai, 2014; Gaunya, 2016; Ahmad et al., 2017; Vidak et al., 2023), using a variety of models, scales, and procedures. Frequently, perceptions of dimensions of work or workplace environment are investigated as antecedents of job satisfaction, without a formal reference to organizational climate as a concept (Raziq and Maulabakhsh, 2015; Santana and Loureiro, 2019; Molina-Hernández et al., 2021), even if dimensions align with facets of psychological climate. Job satisfaction has been studied as a direct outcome of organizational climate (Lu et al., 2005) and also as a mediator between climate and other outcomes, such as productivity (Patterson et al., 2004) and turnover intention (Li et al., 2020).

Job satisfaction is a recurrent theme in the research literature in the fields of management sciences and health sciences because of its links with turnover, workers' health and wellbeing, patients' safety and satisfaction, and other practice-related outcomes. The results from the searches conducted with the working query in different databases during the preparatory phase of this study confirm this statement, as well as the little research available on organizational climate conducted in healthcare settings (see Appendix). A few systematic reviews dealing with organizational climate or job satisfaction in healthcare practice were found in the literature, but there was none dealing with both concepts and the relationships between them. Therefore, a systematic review was

deemed necessary to examine aspects of climate and job satisfaction in healthcare organizations.

Given the inconsistencies in terminology and the lack of clear theoretical positioning found in many studies analyzed in the preparatory phase, we will consider studies addressing psychological climate and organizational (aggregate) climate, as defined by others (James et al., 2008), whenever conducted in healthcare organizations. For the sake of rigor and to avoid ambiguity, from now on, we will use climate to represent both concepts in framing discourse, always guaranteeing the use of the terminology proposed by a specific study when citing them.

1.4. Review questions

The objective of our study is to map the dynamics of organizational climate and job satisfaction in healthcare organizations from the practice and the research perspectives, by means of two complementary systematic reviews addressing the main research questions of the overall project: (1) To what extent and how have climate and job satisfaction been researched in organizations delivering healthcare services and what is the evidence on their impact? (2) How have climate and job satisfaction been measured in healthcare organizations and what is the quality of the evidence available in this regard?

Subsequently, we have defined the following specific questions (SQ) for review 1 and review 2.

1.4.1. Review 1

R1SQ1: To what extent have the concepts of climate and job satisfaction been researched in healthcare organizations?

R1SQ2: What models have been proposed and tested by studies addressing climate and job satisfaction in healthcare organizations?

R1SQ3: What has been reported regarding outcomes of climate and job satisfaction in healthcare organizations and what is the quality of the evidence available in this regard?

R1SQ4: What practice-related challenges in dealing with climate and job satisfaction in healthcare organizations are reported in the literature?

R1SQ5: What characterizes the research designs and the methodological options of studies on climate and job satisfaction conducted in healthcare organizations?

R1SQ6: What challenges and future directions have been discussed regarding research on climate and job satisfaction in healthcare organizations?

1.4.2. Review 2

R2SQ1: What measures of climate and job satisfaction have been used in healthcare organizations?

R2SQ2: What are the psychometric properties of measures of climate and job satisfaction used in healthcare organizations?

R2SQ3: What is the overall quality of studies on climate and job satisfaction in healthcare organizations?

R2SQ4: What challenges and future directions have been discussed regarding measures of climate and job satisfaction in healthcare organizations?

2. Methods

2.1. Study procedure

The study is following the best practice available, assuring rigor and replicability. The Cochrane protocol guide (Higgins et al., 2019) was used to guide the development of the study protocol. The protocol complies with Preferred Reporting Items for Systematic Reviews and Meta-Analysis Protocols (PRISMA-P, http://www.prisma-statement.org/documents/PRISMA-P-checklist.pdf). The Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA, http://www.prisma-statement.org) (Liberati et al., 2009; Moher et al., 2009) will be used to report the systematic reviews. The systematic reviews have been submitted to the International Prospective Register of Systematic Reviews (PROSPERO) database and awaiting registration.

Review 1 and Review 2 address different specific research questions, by using the same primary studies to which the same eligibility criteria and screening process apply. We have established a participant/population, intervention, comparator, context, and outcome (PICCO) framework, a slightly modified version of the traditional PICO (participants/population, intervention, comparator, and outcome). A few limitations of PICO have been identified even in the health area (Huang et al., 2006). We expect it to underperform in situations that involve complex and fast-changing environments, over which observers, researchers, implementers, and users have little, or even no, overall control. Therefore, detailed description and characterization of context conditions and changes to context conditions are of paramount importance in understanding further developments and outcomes (O) of interventions (I) reflected on the participants/population (P), justifying the inclusion of a context (C) dimension in the framework. The PICCO framework will be used to develop and combine subject headings and keywords and to help analyze, synthesize, and report the results of both systematic reviews. The complementary systematic reviews will progress in the following way: formulation of research questions, literature search, selection of papers, extraction of data, appraisal of study quality, analysis of data, synthesis of data, and report and use of results. Extraction spreadsheets will be organized to serve Review 1 and Review 2, allowing data extraction and data synthesis to be performed concurrently for both reviews.

2.2. Eligibility criteria

The research will include studies fulfilling all the following requisites: (1) investigate climate and job satisfaction in organizations delivering health care services; (2) discuss measures and/or models used in research on climate and job satisfaction; (3) address individuals working in healthcare organizations in a position with a direct or indirect influence on delivering health care services, by the time they participated in a study on climate or job satisfaction in that healthcare setting. We will include studies conducted in public or private healthcare organizations independent of the country, such as hospitals, health centers and other primary care settings, units of integrated care networks providing health care services and other health care practices.

Studies measuring only specific aspects of climate (e.g., autonomy) or job satisfaction (e.g., benefits) will be excluded.

The general outcomes defined for the study are climate and job satisfaction in healthcare organizations. Review 1 and Review 2 will consider studies that include the following specific outcomes, from the practice and the research perspectives. Review 1 main outcomes are: (1) effects/outcomes of climate and job satisfaction; (2) practice-related challenges in dealing with climate and job satisfaction in healthcare organizations; (3) models depicting dynamics of climate and job satisfaction in healthcare organizations; (4) research designs and methodological options of included studies; (5) challenges and future directions in research on climate and job satisfaction in healthcare organizations. Review 1 secondary outcomes are: (1) tested climate and job satisfaction measures; (2) psychometric properties of climate and job satisfaction measures. Review 2 main outcomes are: (1) tested climate and job satisfaction measures; (2) psychometric properties of climate and job satisfaction measures. Review 2 secondary outcomes are: (1) effects/outcomes of climate and job satisfaction; (2) practice-related challenges in dealing with climate and job satisfaction in healthcare organizations; (3) models depicting dynamics of climate and job satisfaction in healthcare organizations; (4) research designs and methodological options of included studies; (5) challenges and future directions in research on climate and job satisfaction in healthcare organizations.

Regarding study design, we will include all types of studies if other eligibility criteria are met. Namely, we will consider qualitative, quantitative and mixed methods research; longitudinal, cross-sectional, case control, cohort studies, and trials studies. Literature reviews and systematic reviews will be excluded but their references will be searched for relevant studies. Studies published in English, Portuguese and Spanish will be considered for inclusion. Studies published between January 2000 and the date of search will be included.

2.3. Search strategy

A three-step search strategy will be followed in this study. First, a limited search of SCOPUS and Web of Science databases will be undertaken followed by an analysis of text words contained in the title and the abstract of selected articles and of the keywords used to describe them. In the second step, a search using all relevant keywords and terms identified will be undertaken across all included databases. In the third step, the reference lists of all identified reviews and systematic reviews will be searched for additional pertinent studies. During the search process, several terminologies and spellings of the keywords will be considered as they may affect the identification of relevant studies. The following databases of published studies will be searched: SCOPUS, Web of Science, PUBMED, MEDLINE, and CINAHL.

2.4. Data management

Following the entry of the relevant keywords and identified terms in the search databases, the results will be exported into a folder and uploaded to Rayyan QCRI (Ouzzani et al., 2016). Rayyan will be used to eliminate duplicates and support the initial blind screening of the title and abstract and the blind assessment of full-text studies performed by the teams of reviewers.

2.5. Selection process

The selection process will evolve in three phases. In the first phase, the title and abstract of identified articles will be screened by two independent reviewers to decide on their advance to the second phase. Upon the completion of the title and abstract screening and resolution of any conflicts between pairs of reviewers, the retained studies will be assessed through full-text reading. The discussion will be used to resolve disagreements, and a third reviewer will be consulted if consensus cannot be reached. In the third phase, the studies included will be assigned to Review 1, Review 2, or both and marked accordingly. The process will be demonstrated using a PRISMA flow diagram for Review 1 and a PRISMA flow diagram for Review 2.

2.6. Data collection process and data items

Data will be extracted and collated by two independent reviewers onto predefined data extraction forms. The data extracted will include specific details about the population, intervention, context, outcome of significance to the primary and secondary questions, and aspects of research designs and methodological options of the included studies. Data extraction forms will be validated by the review team prior to utilization to ensure acceptability and study validity. Disagreements between the reviewers regarding extracted data will be resolved through discussion or with a third reviewer.

The following data and information will be extracted:

1. Structural characteristics of the study: author(s), title, affiliation of first author, type of publication, date of publication, and language.
2. Methodological characteristics of the study: the general aim of the study, theoretical/conceptual framework/tradition adopted, definitions provided of core concepts in the interventions, study research questions and/or hypothesis, sample size, other details on research design and methodological options (e.g., type of study and data analysis), and reported limitations.
3. Participants: professional category/provider role and other demographics.
4. Types of intervention(s)/phenomena of interest.
   Model: dimensions, antecedents/determinants, consequents/outcomes, mediators, and moderators.
   Measures: name of measure; domains, subdomains, the total number of items, method of administration, response options, and scoring.
5. Context: type of healthcare organization (e.g., hospital), study setting if applying (i.e., emergency room), and country.
6. Outcomes: reported effects/outcomes of climate and job satisfaction, validated models depicting dynamics of climate

and job satisfaction in healthcare organizations, practice-related challenges in dealing with climate and job satisfaction in healthcare organizations, challenges and future directions in research on climate and job satisfaction in healthcare organizations, climate and job satisfaction measures, psychometric properties of climate and job satisfaction measures, and other measurement properties of interest.

2.7. Risk of bias/quality assessment

The methodological quality of included studies will be assessed by two independent reviewers. Any disagreements arising between the reviewers will be resolved through discussion and with a third reviewer, if necessary. The quality assessment will identify and exclude studies not meeting minimum research and/or professional standards (e.g., reporting mere opinions, suffering from ethical problems or some type of gross bias, and omitting sources of data) and will generate quality ratings to qualify the synthesis results. The psychometric properties of the measures used in each study will be assessed, as part of the quality assessment procedure, and tabulated to be used in the data synthesis in Review 2.

Considering the type of interventions sought and the expected complex nature of the contexts involved, it is anticipated that the likelihood of including studies based on experimental designs is low, that part of the included studies will be descriptive, and that those studies reporting on results from implementations will be based mostly on observational data and cross-sectional studies. We also expect high heterogeneity in study designs. Therefore, the direct applicability of well-reputed standardized tools for assessment of methodological validity of studies considered for inclusion in systematic reviews and meta-synthesis was uncertain, and a framework based on a multi-dimensional concept of quality in research will be used during the execution of the review to examine the quality of any studies under consideration. The framework covers relevance, conceptual depth and breadth, methodological rigor, and quality of reporting and will assess the description of the problem being addressed, conceptual soundness, the existence of definitions of central concepts, description of methodological approach, identification of the study objective(s), description of study/implementation context, identification of outcomes sought, description of the methods of data collection and analysis, evidence on selective reporting bias, choice of research design, evidence on quality of any data collected, the relevance of the results, and weight of evidence.

2.8. Data synthesis

Data extracted from the studies included will be summarized numerically, by describing the number and characteristics of studies in overview tables, and narratively, by synthesizing data around the defined concepts and data items. We will perform a realist synthesis - a narrative synthesis (Popay et al., 2006) with a focus on the relationship between context, mechanisms under research, and outcomes (CMO) (Pawson, 2002; Pawson et al., 2005; Rycroft-Malone et al., 2012) - to cross-analyze and synthesize the findings regarding the characteristics of populations, contexts, and interventions, the direction and size of effects, the various plausible mechanisms at work, and how they interact with context to determine outcomes. To deliver the answers to R2SQ2 and R2SQ3, the psychometric properties of the measures in each study will be graded, and the studies will be grouped by measure to produce a qualitative summary, the pooled ratings for all measurement properties, and, finally, the overall grade of the quality of evidence on each measure. All ratings will be performed independently by two reviewers.

The synthesis will be performed with a focus on concepts and themes (Popay et al., 2006), namely, those concepts and themes that would allow us to understand, or even explain, questions related to population-context-mechanism (activated by the intervention)-outcomes interactions. To summarize and report a synthesis across all the included studies, we will develop a provisional theory of how and why the intervention works (Popay et al., 2006) against which to compare the findings of the different studies in an iterative way. This will lead to increasingly complete versions of the preliminary synthesis until all the evidence in the available data is used.

We will consider the effect of any moderator variables (Popay et al., 2006) and will use the Weight of Evidence (WoE) rating (Gough, 2007) to examine the robustness of findings and to summarize the reviewers' assessment. We will evaluate the feasibility of a sensibility analysis after having a precise idea of the data available from the primary quantitative studies as we expect most studies to have a non-experimental nature.

The methods were chosen due to the foreseen nature of the studies to be included and our interest in understanding the contexts and the mechanisms that are part of the explanation of the outcomes of a given intervention, and because the realist synthesis will allow us to assess the external validity of the primary studies (van der Knaap et al., 2008).

Given the type of interventions sought and the diversity of the contexts involved, and considering the studies analyzed during the pilot phase, we ruled out the possibility of performing a standard meta-analysis. Still, graphic analyses will be considered after having a precise idea of the data available from the studies included.

At this stage of the review, there will be no further filtering of primary studies, involving the application of further exclusion criteria.

3. Results

The protocol here reported, by the nature of its theme, objectives, and methodology, lays down a valuable space and opportunity to address the dynamics of organizational climate and job satisfaction in healthcare services practice and research while delivering rigorous guidelines for evidence search, systematization, assessment, and reporting in this field.

We defined clear specific objectives for the study, identified the guidelines used to report the protocol and the upcoming systematic reviews, and described the PICCO framework to be used to develop and combine subject headings and keywords in the search phase

and to help analyze, synthesize, and report the results of both systematic reviews.

We delivered eligibility criteria anchored on a PICCO framework and the required general characteristics of primary studies considered for inclusion in the research. We set up a search strategy designed to minimize bias and errors. We defined research methods that allow us to identify, categorize, analyze, and report aggregated evidence on the dynamics of organizational climate and job satisfaction in healthcare services practice and research while minimizing the risk of bias and errors in analysis and reporting. Following the best guidance and practice available, we previewed methods to assess and report the quality of the studies included.

Preliminary searches were conducted in February 2023. Databases will be queried for published studies on May 2023, and we expect to complete the review by December 2024.

4. Discussion

To the best of our knowledge, the protocol reported in this paper is unique in its objectives and methodology. Results from searches conducted with the work query in different databases during the preparatory phase of this study confirm this statement, as well as the little research available on organizational climate conducted in healthcare settings. A few systematic reviews dealing with organizational climate or job satisfaction in health care practice were found in the literature but, generally, those studies did not conform to relevant guidelines and were not built on clear methods, defined a priori, to identify, categorize, analyze and report aggregated evidence on a specific topic. Moreover, we could not find any published protocol for a systematic review or a complete systematic review dealing with both concepts and the relationships between them.

The study will deliver breadth and depth in mapping and assessment, including prevalence of research and their quality, measures of climate and job satisfaction and their psychometric properties, models and research methodologies, reported outcomes from climate and job satisfaction in healthcare organizations.

A major strength of our study is that it will provide evidence on dynamics of climate and job satisfaction in healthcare organizations published in the 21 century, while uncovering and assessing gaps in theoretical and applied research in these fields. A limitation of this protocol is that, while covering the languages spoken by a very significant part of the world population, it will not be able to rule out some cultural and geographic bias, due to the exclusion of studies published in other important languages, such as Mandarin Chinese, Hindi and Arabic.

5. Conclusion

Study protocols are instrumental in guaranteeing strict guidance, replicability, consistency, accountability, transparency and learning in evidence-based research and practice, regardless of disciplinary and application field. They represent the first step toward the construction of a rich, trustworthy, evidence-based knowledge base and act as references for fellow researchers, policy makers and other stakeholders. This is particularly true in the core area of our study, where a preliminary search of available literature has revealed a fragmented research field whereas there is an urgent need to promote awareness and investment in work conditions and job satisfaction of health care professionals.

The results from the application of this protocol will be reported in two systematic reviews, addressing different aspects of research on climate and job satisfaction and in part using different analysis and reporting techniques and tools. Yet, the pool of primary studies and the eligibility criteria are the same, therefore conditions are in place to research both conceptual aspects, outcomes in work settings and methodological aspects within the same universe of primary studies and time frame and integrate the results in meaningful way.

We anticipate that the results will help to contextualize and integrate disciplinary- and specific- outcomes-oriented approaches and facilitate the work and decision-making of health care professionals, managers in healthcare organizations, policy makers, governmental agencies, regulators, funders, advocacy groups, and researchers. Finally, we expect to identify areas in need of further research, especially in the intersection of disciplinary fields. The potential to advance available knowledge and contribute to better work practices is high, as many of the areas addressed by this work are underserved by published literature.

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.

Author contributions

SS conceptualized the study. SS and CP-R carried out the preliminary database searches, were involved in the selection and analysis of studies that form the bibliographic support of this protocol, piloted the study selection process, wrote and edited the original draft, and approved the final submission.

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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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References

Afsharian, A., Zadow, A., Dollard, M. F., Dormann, C., and Ziaian, T. (2018). Should psychosocial safety climate theory be extended to include climate strength? *J. Occup. Health Psychol.* 23, 496–507. doi: 10.1037/ocp0000101

Ahmad, R., Islam, T., and Saleem, S. S. (2017). Employee engagement, organizational commitment, and job satisfaction as consequent of perceived CSR: a mediation model. *J. Res. Soc. Pakistan* 54, 153–168.

Amiresmaili, M., and Moosazadeh, M. (2013). Determining job satisfaction of nurses working in hospitals of Iran: A systematic review and meta-analysis. *Iran. J. Nurs. Midwifery Res.* 18, 343–348.

Arab, M., Pourreza, A., Akbari, F., Ramesh, N., and Aghlmand, S. (2007). Job satisfaction on primary health care providers in the rural settings. *Iran. J. Public Health*, 36, 64–70.

Baker, W. K. (2004). Antecedents and consequences of job satisfaction: testing a comprehensive model using integrated methodology. *J. Appl. Bus. Res.* 20, 2004. doi: 10.19030/jabr.v20i3.2212

Belita, A., Mbindyo, P., and English, M. (2013). Absenteeism amongst health workers - developing a typology to support empiric work in low-income countries and characterizing reported associations. *Hum. Resour. Health* 11, 1–10. doi: 10.1186/1478-4491-11-34

Berberoglu, A. (2018). Impact of organizational climate on organizational commitment and perceived organizational performance: empirical evidence from public hospitals. *BMC Health Serv. Res.* 18, 1–9. doi: 10.1186/s12913-018-3149-z

Bhuian, S. N., and Menguc, B. (2002). An extension and evaluation of job characteristics, organizational commitment and job satisfaction in an expatriate, guest worker, sales setting. *J. Pers. Sell. Sales Manag.* 22, 1–11. doi: 10.1080/08853134.2002.10754288

Bodur, S. (2002). Job satisfaction of health care staff employed at health centres in Turkey. *Occup. Med.* 52, 353–355. doi: 10.1093/occmed/52.6.353

Campbell, P., Mertens, D., Seitz, P., and Cox, S. (1982). *Job Satisfaction - Antecedents and Associations.*

Cardona Echeverri, D. R., and Zambrano Cruz, R. (2014). Review of organizational climate assessment tools. *Estud. Gerenc.* 30, 184–189. doi: 10.1016/j.estger.2014.04.007

Chan, D. (1998). Functional relations among constructs in the same content domain at different levels of analysis: A typology of composition models. *J. Appl. Psychol.* 83, 234–246. doi: 10.1037/0021-9010.83.2.234

Chen, Y., You, Y., Wang, Y., Wang, Y., and Dai, T. (2022). Systematic and meta-based evaluation on job satisfaction of village doctors: an urgent need for solution issue. *Front. Med.* 9:856379. doi: 10.3389/fmed.2022.856379

Clarke, S. P., Sloane, D. M., and Aiken, L. H. (2011). Effects of hospital staffing and organizational climate on needlestick injuries to nurses. *Am. J. Public Health* 92, 1115–1119. doi: 10.2105/AJPH.92.7.1115

Coomber, B., and Louise Barriball, K. (2007). Impact of job satisfaction components on intent to leave and turnover for hospital-based nurses: a review of the research literature. *Int. J. Nursing Stud.* 44, 297–314. doi: 10.1016/j.ijnurstu.2006.02.004

D'Amato, A. (2023). From research to action and back again: the long journey of organizational climate-a review of the literature and a summative framework. *J. Gen. Manag.* doi: 10.1177/03063070231152010

Davis-Blake, A., and Pfeffer, J. (1989). Just a mirage: the search for dispositional effects in organizational research., 14, 385–400. doi: 10.2307/258174

Dawson, J. F., González-Rom,á, V., Davis, A., and West, M. A. (2008). Organizational climate and climate strength in UK hospitals. *Eur. J. Work Organization Psychol.* 17, 89–111. doi: 10.1080/13594320601046664

de Vries, R. E., Roe, R. A., and Taillieu, T. C. B. (1998). Need for supervision: Its impact on leadership effectiveness. *J. Appl. Behav. Sci.* 34, 486–501. doi: 10.1177/0021886398344015

Fang, Y. (2001). Turnover propensity and its causes among Singapore nurses: an empirical study. *Int. J. Human Resour. Manag.* 12, 859–871. doi: 10.1080/713769669

Faragher, E. B., Cass, M., and Cooper, C. L. (2005). The relationship between job satisfaction and health: a meta-analysis. *Occup. Environ. Med.* 62, 105–112. doi: 10.1136/oem.2002.006734

Gaunya, C. R. (2016). Organizational climate as a determinant of job satisfaction among public sector employees in Kisii County, Kenya. *J. Resour. Dev. Manag.* 23, 47–53.

Gershon, R. R. M., Stone, P. W., Zeltser, M., Faucett, J., Macdavitt, K., and Chou, S. S. (2007). Organizational climate and nurse health outcomes in the United States: a systematic review. *Ind. Health* 45, 622–636. doi: 10.2486/indhealth.45.622

Gough, D. (2007). Weight of evidence: a framework for the appraisal of the quality and relevance of evidence. *Res. Pap. Educ.* 22, 213–228. doi: 10.1080/02671520701296189

Griffin, R. W., Bateman, T. S., Wayne, S. J., and Head, T. C. (1987). Objetive and social factors as determinants of task perceptions and responses: an integrated perspective and empirical investigation. *Acad. Manag. J.* 30, 501–523. doi: 10.2307/256011

Haas, J. S., Cook, E. F., Puopolo, A. L., Burstin, H. R., Cleary, P. D., and Brennan, T. A. (2000). Is the professional satisfaction of general internists associated with patient satisfaction? *J. Gen. Intern. Med.* 15, 122–128. doi: 10.1046/j.1525-1497.2000.02219.x

Hackman, J. R., and Oldman, G. R. (2007). "How job characteristics theory happened," in *Great Minds in Management: The process of theory development,* eds. K. G. Smith and M. A. Hitt (Oxford, UK: Oxford University Press), 151–170.

Higgins, J. P., Thomas, J., Chandler, J., Cumpston, M., Li, T., Page, M. J., et al. (eds.). (2019). "Cochrane handbook for systematic reviews of interventions," in *Cochrane handbook for systematic reviews of interventions, 2nd Edition* (Chichester: John Wiley & Sons). doi: 10.1002/9781119536604

Hsiung, K. S., Colditz, J. B., Mcguier, E. A., Switzer, G. E., Vonville, H. M., Folb, B. L., et al. (2020). Measures of organizational culture and climate in primary care: a systematic review. *J. Gen. Intern. Med.* 36, 487–499. doi: 10.1007/s11606-020-06262-7

Huang, X., Lin, J., and Demner-Fushman, D. (2006). Evaluation of PICO as a knowledge representation for clinical questions. *AMIA Annu. Symp. Proc.* 359–363.

James, L. R. (1982). Aggregation bias in estimates of perceptual agreement. *J. Appl. Psychol.* 67, 219–229. doi: 10.1037/0021-9010.67.2.219

James, L. R., Choi, C. C., Ko, C. H. E., McNeil, P. K., Minton, M. K., Wright, M. A., et al. (2008). Organizational and psychological climate: A review of theory and research. *Eur. J. Work Organ. Psychol.* 17, 5–32. doi: 10.1080/13594320701662550

James, L. R., and Jones, A. P. (1974). Organizational climate: a review of theory and research. *Psychol. Bull.* 81, 1096–1112. doi: 10.1037/h0037511

James, L. R., and Sells, S. B. (1981). "Psychological climate: theorical perspectives and empirical research," in *Towards a psychology of situation: An interactual perspective,* eds. L. Magnusson, (New York, NY: Erlbaum Associates). 275–295.

James, L. R., and Tetrick, L. E. (1986). Confirmatory analytic tests of three causal models relating job perceptions to job satisfaction. *J. Appl. Psychol.* 71, 77–82. doi: 10.1037/0021-9010.71.1.77

Junça-Silva, A., and Freire, M. (2022). The role of organizational climate, and work-family conflict in burnout: the case of teachers. *Sustainability* 14:13871. doi: 10.3390/su142113871

Kontodimopoulos, N., Paleologou, V., and Niakas, D. (2009). Identifying important motivational factors for professionals in Greek hospitals. *BMC Health Serv. Res.* 9, 1–11. doi: 10.1186/1472-6963-9-164

Lambert, E. G., Hogan, N. L., and Barton, S. M. (2001). The impact of job satisfaction on turnover intent: a test of a structural measurement

model using a national sample of workers. *Soc. Sci. J.* 38, 233–250. doi: 10.1016/S0362-3319(01)00110-0

Lee, K., Mileski, M., Fohn, J., Frye, L., and Brooks, L. (2020). Facilitators and barriers surrounding the role of administration in employee job satisfaction in long-term care facilities: a systematic review. *Healthcare* 8:360. doi: 10.3390/healthcare8040360

Li, Y., Huang, H., and Chen, Y. Y. (2020). Organizational climate, job satisfaction, and turnover in voluntary child welfare workers. *Child. Youth Serv. Rev.* 119:105640. doi: 10.1016/j.childyouth.2020.105640

Liberati, A., Altman, D. G., Tetzlaff, J., Mulrow, C., Gøtzsche, P. C., Ioannidis, J. P. A., et al. (2009). The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. *Ann. Intern. Med.* 151, 264–269. doi: 10.7326/0003-4819-151-4-200908180-00136

Lindell, M. K., and Brandt, C. J. (2000). Climate quality and climate consensus as mediators of the relationship between organizational antecedents and outcomes. *J. Appl. Psychol.* 85, 331–348. doi: 10.1037/0021-9010.85.3.331

Locke, E. A. (1976). "The nature and causes of job satisfaction," in *Handbook of Industrial and Organizational Psychology,* eds. M. D. Dunnette (Chicago, IL: Rand McNally), 1297—1350.

Loh, M. Y., Idris, M. A., Dormann, C., and Muhamad, H. (2019). Organisational climate and employee health outcomes: a systematic review. *Saf. Sci.* 118, 442–452. doi: 10.1016/j.ssci.2019.05.052

Lu, H., While, A. E., and Louise Barriball, K. (2005). Job satisfaction among nurses: a literature review. *Int. J. Nurs. Stud.* 42, 211–227. doi: 10.1016/j.ijnurstu.2004.09.003

MacDavitt, K., Chou, S. S., and Stone, P. W. (2007). Organizational climate and health care outcomes. *Jt. Comm. J. Qual. Patient Saf.* 33, 45–56. doi: 10.1016/S1553-7250(07)33112-7

Mathieu, J. E., Hofmann, D. A., and Farr, J. L. (1993). Job perception–job satisfaction relations: an empirical comparison of three competing theories. *Organ. Behav. Hum. Decis. Process.* 56, 370–387. doi: 10.1006/obhd.1993.1060

Mertala, S. M., Kanste, O., Keskitalo-Leskinen, S., Juntunen, J., and Kaakinen, P. (2022). Job Satisfaction among occupational therapy practitioners: a systematic review of quantitative studies. *Occup. Ther. Health Care* 36, 1–28. doi: 10.1080/07380577.2021.1964146

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., Liberati, A., and Altman, D. G. (2009). *Reprint-Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement*. doi: 10.7326/0003-4819-151-4-200908180-00135

Molina-Hernández, J., Fernández-Estevan, L., Montero, J., and González-García, L. (2021). Work environment, job satisfaction and burnout among Spanish dentists: a cross-sectional study. *BMC Oral Health* 21, 1–10. doi: 10.1186/s12903-021-01480-9

Ouzzani, M., Hammady, H., Fedorowicz, Z., and Elmagarmid, A. (2016). Rayyan-a web and mobile app for systematic reviews. *Syst. Rev.* 5, 210. doi: 10.1186/s13643-016-0384-4

Parker, C. P., Baltes, B. B., Young, S. A., Huff, J. W., Altmann, R. A., Lacost, H. A., et al. (2003). Relationships between psychological climate perceptions and work outcomes: a meta-analytic review. *J. Organ. Behav.* 24, 389–416. doi: 10.1002/job.198

Patterson, M., Warr, P., and West, M. (2004). Organizational climate and company productivity: the role of employee affect and employee level. *J. Occup. Organ. Psychol.* 77, 193–216. doi: 10.1348/096317904774202144

Patterson, W.est, M. A., Shackleton, V. J., Dawson, J. F., Lawthom, R., Maitlis, S., Robinson, D. L., et al. (2005). Validating the organizational climate measure: links to managerial practices, productivity and innovation. *J. Organ. Behav.* 26, 379–408. doi: 10.1002/job.312

Pawson, R. (2002). Evidence-based policy: in search of a method. *Evaluation* 8, 157–181. doi: 10.1177/1358902002008002512

Pawson, R., Greenhalgh, T., Harvey, G., and Walshe, K. (2005). Realist review-a new method of systematic review designed for complex policy interventions. *J. Health Serv. Res. Policy* 10, 21–34. doi: 10.1258/1355819054308530

Penconek, T., Tate, K., Bernardes, A., Lee, S., Micaroni, S. P. M., Balsanelli, A. P., et al. (2021). Determinants of nurse manager job satisfaction: a systematic review. *Int. J. Nurs. Stud.* 118:103906. doi: 10.1016/j.ijnurstu.2021.103906

Pillay, R. (2009). Work satisfaction of professional nurses in South Africa: a comparative analysis of the public and private sectors. *Hum. Resour. Health* 7, 1–10. doi: 10.1186/1478-4491-7-15

Poghosyan, L., Nannini, A., and Clarke, S. (2013). Organizational climate in primary care settings: Implications for nurse practitioner practice. *J. Am. Acad. Nurse Pract.* 25, 134–140. doi: 10.1111/j.1745-7599.2012.00765.x

Pomirleanu, N., Gustafson, B. M., and Townsend, J. (2022). Organizational climate in B2B: a systematic literature review and future research directions. *Ind. Mark. Manag.* 105, 147–158. doi: 10.1016/j.indmarman.2022.05.016

Popay, J., Roberts, H., Sowden, A., Petticrew, M., Arai, L., Rodgers, M., et al. (2006). *Guidance on the conduct of narrative synthesis in systematic reviews. A product from the ESRC Methods Programme*, 1.

Powell, B. J., Mettert, K. D., Dorsey, C. N., Weiner, B. J., Stanick, C. F., Lengnick-Hall, R., et al. (2021). Measures of organizational culture, organizational climate, and implementation climate in behavioral health: a systematic reviewreview. *Implement. Res. Pract.* 2:263348952110188. doi: 10.1177/26334895211018862

Qian, F., and Lim, M. K. (2008). Professional satisfaction among Singapore physicians. *Health Policy.* 85, 363–371. doi: 10.1016/j.healthpol.2007.09.010

Rafferty, E. A., and Griffin, M. A. (eds.). (2009). "Job satisfaction in organizational research," in *The Sage Handbook of Organizational Research Methods* (SAGE Publications Ltd.), 196–212.

Rantanen, I., and Tuominen, R. (2011). Relative magnitude of presenteeism and absenteeism and work-related factors affecting them among health care professionals. *Int. Arch. Occup. Environ. Health* 84, 225–230. doi: 10.1007/s00420-010-0604-5

Rathert, C., and May, D. R. (2007). Health care work environments, employee satisfaction, and patient safety: care provider perspectives. *Health Care Manage. Rev.* 32, 2–11. doi: 10.1097/00004010-200701000-00002

Raziq, A., and Maulabakhsh, R. (2015). Impact of working environment on job satisfaction. *Procedia Econom. Financ.* 23, 717–725. doi: 10.1016/S2212-5671(15)00524-9

Roch, G., Dubois, C. A., and Clarke, S. P. (2014). Organizational climate and hospital nurses' caring practices: a mixed-methods study. *Res. Nurs. Health* 37, 229–240. doi: 10.1002/nur.21596

Rycroft-Malone, J., Mccormack, B., Hutchinson, A. M., Decorby, K., Bucknall, T. K., Kent, B., et al. (2012). Realist synthesis: illustrating the method for implementation research. *Implement. Sci.* 7, 1–10. doi: 10.1186/1748-5908-7-33

Ryu, H. Y., Hyun, D. S., Jeung, D. Y., Kim, C. S., and Chang, S. J. (2020). Organizational climate effects on the relationship between emotional labor and turnover intention in Korean firefighters. *Safety Health.* 11, 479–484. doi: 10.1016/j.shaw.2020.08.007

Salancik, G. R., and Pfeffer, J. (1978). A social information processing approach to job attitudes and task design. *Adm. Sci. Q.* 23, 224–253. doi: 10.2307/2392563

Santana, S., and Loureiro, S. M. C. (2019). Analysing drivers and outcomes of job and professional satisfaction at health centres in Portugal. *Benchmarking* 26, 1357–1375. doi: 10.1108/BIJ-05-2017-0107

Schneider, B., Bowen, D., Ehrhart, M., and Holcombe, K. (2000). "The climate for service. *evolution of a concept,*" in *Handbook or Organizational Culture and Climate.* California, CA: Sage Thousand Oaks. SAGE.

Schneider, B., Ehrhart, M. G., and Macey, W. H. (2011). "Organizational climate research achievements and the road ahead," in *The handbook of organizational culture and climate* (2nd Edition), eds. N. Ashkanasy, C. Wilderom, and M. Peterson, Sage Publication, Inc. doi: 10.4135/9781483307961.n3

Schneider, B., Ehrhart, M. G., and MacEy, W. H. (2013). Organizational climate and culture. *Annu. Rev. Psychol.* 64, 361–388. doi: 10.1146/annurev-psych-113011-143809

Schneider, B., Salvaggio, A. N., and Subirats, M. (2002). Climate strength: a new direction for climate research. *J. Appl. Psychol.* 87, 220–229. doi: 10.1037/0021-9010.87.2.220

Shi, X., Xiong, D., Zhang, X., Han, M., Liu, L., and Wang, J. (2023). Analysis of factors influencing the job satisfaction of medical staff in tertiary public hospitals, China: a cross-sectional study. *Front. Psychol.* 14, 317. doi: 10.3389/fpsyg.2023.1048146

Sleutel, M. R. (2000). Climate, culture, context, or work environment? organizational factors that influence nursing practice. *J. Nurs. Adm.* 30, 53–58. doi: 10.1097/00005110-200002000-00002

Staw, B. M., and Cohen-Charash, Y. (2005). The dispositional approach to job satisfaction: more than a mirage, but not yet an oasis. *J. Organ. Behav.* 26, 59–78. doi: 10.1002/job.299

Taunton, R. L., Bott, M. J., Koehn, M. L., Miller, P., Rindner, E., Pace, K., et al. (2004). The NDNQI-adapted index of work satisfaction. *J. Nurs. Meas.* 12, 101–122. doi: 10.1891/jnum.2004.12.2.101

Tenaw, Z., Siyoum, M., Tsegaye, B., Werba, T. B., and Bitew, Z. W. (2021). Health professionals job satisfaction and associated factors in Ethiopia: a systematic review and meta-analysis. *Health Serv. Res. Manag. Epidemiol.* 8, 1–12. doi: 10.1177/23333928211046484

Thompson, L., and Rose, J. (2011). Does organizational climate impact upon burnout in staff who work with people with intellectual disabilities? a systematic review of the literature. *J. Intellect. Disabil.* 15, 177–193. doi: 10.1177/1744629511419616

Tsai, C. L. (2014). The organizational climate and employees' job satisfaction in the Terminal operation context of Kaohsiung port. *Asian J. Shipp. Logist.* 30, 373–392. doi: 10.1016/j.ajsl.2014.12.007

van der Knaap, L. M., Leeuw, F. L., Bogaerts, S., and Nijssen, L. T. J. (2008). Combining Campbell standards and the realist evaluation approach: the best of two worlds? *Am. J. Eval.* 29, 48–57. doi: 10.1177/1098214007313024

van Saane, N., Sluiter, J. K., Verbeek, J. H. A. M., and Frings-Dresen, M. H. W. (2003). Reliability and validity of instruments measuring job satisfaction - a systematic review. *Occup. Med.* 53, 191–200. doi: 10.1093/occmed/kqg038

Vidak, M., Tomić, V., Buljan, I., Tokalić, R., and Marušić, A. (2023). Perception of organizational climate by university staff and students in medicine and humanities: a qualitative study. *Accountabil. Res.* 1–27. doi: 10.1080/08989621.2023.2173586

von Treuer, K., Fuller-Tyszkiewicz, M., and Little, G. (2014). The impact of shift work and organizational work climate on health outcomes in nurses. *J. Occup. Health Psychol.* 19, 453–461. doi: 10.1037/a0037680

Wallace, J. C., Edwards, B. D., Paul, J., Burke, M., Christian, M., and Eissa, G. (2013). Change the referent? a meta-analytic investigation of direct and referent-shift consensus models for organizational climate. *J. Manag.* 42, 838–861. doi: 10.1177/0149206313484520

Zacher, H., and Yang, J. (2016). Organizational climate for successful aging. *Front. Psychol.* 7:1007. doi: 10.3389/fpsyg.2016.01007

Zhenjing, G., Chupradit, S., Ku, K. Y., Nassani, A. A., and Haffar, M. (2022). Impact of employees' workplace environment on employees' performance: a multi-mediation model. *Front. Public Health*. 10:890400. doi: 10.3389/fpubh.2022.890400

Appendix

TABLE A1 Number of articles retrieved with the working query from different databases, during the preparatory phase.

Database	Topic	Number of articles
PubMed	Organizational climate or job Satisfaction in healthcare settings	163
	Organizational climate or job satisfaction in general	487
	Organizational climate in healthcare settings	13
	Job satisfaction in healthcare settings	150
	Organizational climate in general	26
	Job satisfaction in general	464
Medline	Organizational climate or job satisfaction in healthcare settings	2.329
	Organizational climate or job satisfaction in general	4.138
	Organizational climate in healthcare settings	475
	Job Satisfaction in healthcare settings	2.017
	Organizational climate in general	813
	Job satisfaction in general	3.493
Scopus	Organizational climate or job satisfaction in healthcare settings	2.714
	Organizational climate or job satisfaction in general	7.627
	Organizational climate in healthcare settings	144
	Job satisfaction in healthcare settings	2.607
	Organizational climate in general	513
	Job satisfaction in general	7.207
WoS	Organizational climate or job satisfaction in healthcare settings	2.185
	Organizational climate or job satisfaction in general	10.798
	Organizational climate in healthcare settings	189
	Job satisfaction in healthcare settings	2.026
	Organizational climate in general	862
	Job satisfaction in general	10.096

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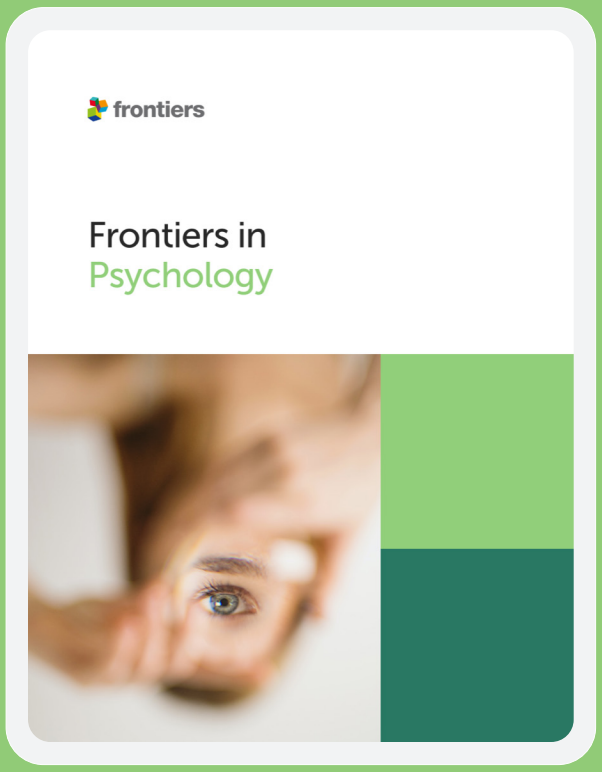

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