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Altruistic leadership and its role in reducing knowledge hiding: the mediating effects of team learning and knowledge culture

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ABSTRACT

Leadership can play an important role in knowledge hiding. This study investigated the unexplored impact of altruistic leadership (AL) on knowledge hiding by assessing the mediating role of team learning (TL) and knowledge culture (KC) in this relationship. Structural equation modeling was used to test 14 hypotheses based on primary data from 368 surveyed Slovakian companies representing diverse enterprises. Data were gathered from various companies spanning a range of industries, including manufacturing, education, wholesale and retail, construction, and information technology. Of these, 164 were from micro-enterprises, 114 were from small enterprises, 67 were from medium-sized enterprises, and 23 were from large enterprises. This article reveals how AL can mitigate the negative effects of knowledge hiding by supporting TL and cultivating a KC. These findings indicate that leaders who exhibit altruistic behavior positively influence TL, enhancing KC and reducing instances of knowledge hiding. The primary data tested in our model confirm that selfless leadership reduces knowledge hiding by encouraging TL and KC. This suggests that, when selecting team leaders, their level of altruism should be considered. The roles of TL and KC in promoting knowledge sharing within organizations and emphasizing the importance of team effectiveness and mutual communication are crucial. This study contributes to the existing literature by examining the direct impact of AL on knowledge-hiding behavior, demonstrating how AL promotes TL and a knowledge-sharing culture, thereby eliminating knowledge hiding, including the practical implications. Future qualitative studies and research extending to other locations could help deepen our understanding of these relationships and incorporate additional concepts and factors.

Introduction

Due to the high competition levels that markets face today, organizations must engage in a continuous learning process. Knowledge is the core component of the learning process and encompasses knowledge acquisition, integration, and leverage. Knowledge is a critical factor that contributes positively to obtaining a competitive advantage for an organization (Pradhan et al., 2019). Knowledge management is a process through which organizations try to manage knowledge effectively. An essential aspect of knowledge management and sharing is the team leader's role, which influences the knowledge-sharing culture of an organization. Leadership is a process whereby an individual influences a group of individuals to achieve a common goal (Kotter, 1999).

This study explores the role of leaders, specifically the altruistic approach to leadership, in knowledge management. Leaders must respond to changing business requirements in an agile, fast, and flexible manner. The rapidly changing markets, dynamic information flows, and drive to replicate successful products, services, or processes push organizations to rely increasingly on leadership and knowledge to enhance performance. Digital transformation is part of the overall challenge that organizations need to navigate (Andrej et al., 2023). Leader-led knowledge management is an important part of this process; thus, in the digital era, managers must adapt their knowledge, skills, and abilities to successfully drive digital transformation within the organization (Rakovic et al., 2024). Khalil et al. (2021) suggested that leadership is essential for promoting employee knowledge-sharing behavior. This also corresponds with the findings of Chiang and Chen (2020), who note that a supportive leader intrinsically motivates employees to create a knowledge-sharing environment. Chen et al. (2024) claimed that knowledge management positively affects knowledge creation. Furthermore, as Andrej et al.

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(2023) mention, leaders who do not recognize the importance of managing knowledge limit the development of organizations and endanger their existence.

According to Czarnecka and Daróczi (2017), companies should focus on employee development because employee knowledge and newly acquired competencies and skills are sources of organizational innovation, especially in today's rapidly changing business environment. Human capital is a key driver of innovation and competitiveness, shaping a company's uniqueness and acquiring skills, capabilities, knowledge, expertise (Costa et al., 2023), and innovation, especially in the global knowledge environment (Mehralian et al., 2013). Organizations achieve their desired goals through the behaviors and skills of their employees. Linking knowledge management and human resources is a highly integrated approach (Antunes & Pinheiro, 2020). Moreover, Abzari and Teimouri (2008) state that a company's ability to integrate, transfer, and use new knowledge determines its level of organizational innovation, such as its ability to respond more quickly to challenges or new information. Several challenges and barriers affect knowledge creation, sharing, and management. One of the challenges in managing knowledge is motivating employees to share knowledge with others and not engage in counterproductive knowledge behaviors. When employees do not share knowledge, it is called knowledge hiding. According to Connelly et al. (2012), knowledge hiding is "an intentional attempt by an individual to withhold or conceal knowledge that another person has requested." Knowledge hiding involves three behaviors (dimensions): *playing dumb (PD), rationalized hiding (RH), and evasive hiding (EH)*. Furthermore, knowledge hiding depends on leadership style, cultural background, and organizational structure. These authors also mention that knowledge hiding does not necessarily harm an individual or an organization (Connelly et al., 2012). The mechanisms that lead people to hide knowledge in work teams have not been sufficiently mapped, and the factors that cause knowledge hiding and their interrelationships have not yet been fully explored. According to Wang and Wang's (2023) bibliometric analysis, topics such as knowledge hiding, innovation, and knowledge spillover appear to be popular, with various research lines emerging from these core concepts. Recently, Škerlavaj et al. (2023) conducted a meta-analysis (10 years after the first seminal paper on knowledge hiding) in which they found that knowledge hiding acts as a mediator for most specified relationships in the literature on job design and individual and leadership phenomena, leading to task performance, organizational citizenship behavior, creativity, and deviance. The authors also mentioned that it is likely that positive leadership styles, such as transformational leadership, can help decrease the occurrence of knowledge-hiding behaviors within teams and organizations (Škerlavaj et al., 2023). However, to our knowledge, only a few studies have examined knowledge hiding in this context with different mediator effects (Abdillah et al., 2022; He & Wei, 2022; Salas-Vallina & Alegre, 2018). Knowledge hiding is a behavioral approach of employees in an organization concerning their work; however, there is very little literature specifically available on employees' knowledge-hiding behavior and how leadership, in connection with team learning (TL) and knowledge culture (KC), can influence these tendencies.

To fill this research gap and address the lack of empirical investigations, this study aimed to empirically explain the impact of altruistic leadership (AL) on knowledge hiding using two mediators: TL and KC. This study empirically demonstrates the link between AL and knowledge-hiding behavior, specifically regarding the dimensions of PD and RH. Consequently, to advance the literature on knowledge hiding, this study proposes a theoretical model explaining the indirect effect of AL on knowledge hiding. This study contributes to a better understanding of the impact of specific factors on team knowledge hiding.

Considering the importance of eliminating knowledge hiding, we examined three positive factors that could reduce employees' knowledge-hiding attempts: AL, TL, and KC. Thus, the authors examined a positive approach to eliminating the negative consequences of knowledge-hiding behavior in their structural model.

The following research question was formulated:

How does AL contribute to eliminating knowledge-hiding behavior among team members?

To answer this research question, fourteen hypotheses were developed and tested using primary data obtained from Slovakian companies. This study had the following objectives:

1. Determine the impact of AL on employees' knowledge-hiding behavior.
2. Analyze the relationship between AL and the mediating effects of TL and KC on knowledge hiding.

The structure of the paper is as follows. First, the literature review covers the theoretical framework of AL, TL, and knowledge hiding. Based on this, the hypotheses are proposed in the same section. The analysis section describes the research methodology and collected data. Next, we present the results of our empirical investigation. The paper concludes with a summary of the potential practical and theoretical implications, as well as the limitations of the research.

Literature review and hypothesis development

Knowledge, knowledge management, and learning

The concept of knowledge is complex and ambiguous (Davenport & Prusak, 1998; Zaim, Keceli, Jaradat & Kastrati, 2018). Its definitions focus on combining data and information to create valuable intangible assets, which can aid decision-making and/or be used productively in an organization. According to Davenport and Prusak 1998, (p. 5): "*knowledge is a human, highly personal asset that represents the pooled expertise, efforts of networks and alliances*". Knowledge is a key resource for firms with high strategic potential, and the ability to manage knowledge has been identified as a prerequisite for innovation success (Martinez-Conesa et al., 2017). Knowledge exists at different organizational levels, such as individuals, groups, and organizations (Ipe, 2003). In general, knowledge is considered information stored in the human mind, and based on this, knowledge transformation from individuals to organizations takes place (Paudel, 2020). The most well-known classification of knowledge is based on Nonaka (1991), which distinguishes knowledge into "tacit" and "explicit." The concept of tacit knowledge encompasses knowledge that is not articulated, readily visible, or is difficult to formalize and express (Nonaka & Takeuchi, 1995). Tacit knowledge is associated with the senses, motor skills, and intuition and is the basis of organizational knowledge creation theory. It is also possible to encounter a situation in which the owner of tacit knowledge is unaware of his/her acquired skills, which can lead to challenges if the knowledge is captured and shared further. Given the variety of uses of tacit knowledge, this type can be described as knowledge that cannot be formally recorded (Cho et al., 2020).

Explicit knowledge can be defined as objective or rational knowledge expressed in various forms, verbally, numerically, or through formulas (Cho et al., 2020). Explicit knowledge is formally and systematically expressed in words and numbers and documented through drawings, written materials, scientific formulas, codified procedures, or policies (Nonaka, 1994; Nonaka & von Krogh, 2009). The role of explicit knowledge is related to changing technological or management practices and processes that are clearly defined and formalized in the organization's environment. If properly managed, knowledge can provide organizations with a significant competitive advantage over their competitors (Davidavičienė et al., 2020).

Knowledge management strategies promote knowledge sharing by connecting people to others and linking them to information so

that they can learn from documented experiences (Armstrong & Taylor, 2023). The concept of encoding and transferring knowledge in organizations is not new; employee training and development programs, organizational policies, routines, procedures, reports, and manuals have performed this function for many years (Alavi & Leidner, 1999). Knowledge management, like the concept of knowledge, is difficult to define (Begoña Lloria, 2008; Earl, 2001). However, defining knowledge management may be easier than defining knowledge per se. In today's economy, knowledge management is critical to building human capital capacity in almost any organization (Majeed, 2009). Knowledge management aims to enhance organizational performance by explicitly designing and implementing tools, processes, systems, structures, and cultures to improve the creation, sharing, and use of all types of knowledge (Long & Fahey, 2000). An analysis of the current literature shows that many definitions of knowledge management differ in the interests, perspectives, and issues presented by different authors. According to (Kaur, 2019, p. 37): "*Knowledge management refers to a set of processes aimed at the effective management as well as use of organizational knowledge that can subsequently facilitate the firm to create value, improve performance and gain strategic advantage over other market players*." The ability to manage knowledge is a mechanism that deliberately and continuously creates knowledge in an organization and ensures its use in creating knowledge synergies (Falát et al., 2023; Kaur, 2019; von Krogh et al., 2001). According to Singh (2008), knowledge management facilitates knowledge sharing and establishes learning as a continuous organizational process. According to Argote and Miron-Spektor 2011, (p. 5), *"Organizational learning is a change in an organization that occurs when the organization acquires new experiences.*" Depending on the type, experience can also be called knowledge, which can be embedded in individuals, repositories, routines, or memory systems. Many authors emphasize the importance of individuals' professional development in enhancing organizational learning and development, as acquiring new skills can benefit organizations in creating, capturing, and sharing knowledge. TL results from collaboration and communication, which increase team members' shared understanding of their tasks, resources, teams, and contexts (Edmondson et al., 2007; Zhang & Min, 2019). Zellmer-Bruhn and Gibson (2006) defined it as the effort of individuals working in groups to achieve a common goal. Pandey et al. (2019) mentioned that TL plays a crucial role in learning organizations in which individuals strive to complete their assigned goals.

New forms of leadership in the digital age

Leadership is essential for promoting knowledge sharing and subsequent learning within organizations. Leadership styles vary across leaders and industries, leading to diverse approaches and strategies. Leadership is connected to employee behavior, a psychological approach to improving efficiency. In recent years, with the rise of the digital era and Industry 4.0, the authors have begun to discuss transformational leadership styles that are considered crucial in digital leadership and involve digital technology. The potential benefit of technology for any business is its ability to stimulate collaborative work, thereby producing dramatic changes in the culture and practices of knowledge management (Bratianu & Bejinaru, 2019). Digital leadership is gaining increasing attention, emphasizing the importance of leaders developing technological skills and implementing technology wisely (Musaigwa & Kalitanyi, 2024). A review of existing leadership concepts shows that transformational leadership follows a leader's vision for the future. This seems particularly relevant in digitalization, as it offers technological possibilities that many still find difficult to imagine (Hensellek, 2020). Bass (1985) first proposed a framework for transformational and transactional leadership.

Transactional leadership is considered the traditional form of leadership within organizations (Burns, 1978), and it involves an exchange between leaders and followers to fulfill their self-interests. By contrast, transformational leadership seeks to operate beyond self-interest, motivating visionary and enthusiastic leaders to embrace and promote adaptive learning. This approach involves blending existing and new knowledge, experimenting, and encouraging others to do so (Bucic et al., 2010). Despite the clear distinction between transformational and transactional leadership styles, Bass (1985) suggests that transformational leadership is an extension of transactional leadership; therefore, a leader can simultaneously be both or neither. However, leader- or ego-centered leadership models do not work in today's digital age's knowledge and creative economies (Jakubik & Berazhny, 2017). Therefore, a new leadership approach should be applied where the leader is not at the center. According to Bass and Riggio (2005), transformational leaders focus on developing and empowering their followers, which is a key aspect of altruistic behavior.

Therefore, AL, also known as human-centered leadership, emphasizes great attention to employees' needs and sacrifices self-interest to benefit them (He & Wei, 2022). This could be the perfect way to navigate leadership in the current economy. Altruism influences positive employee attitudes.

Altruistic leadership and knowledge hiding

Obrenovic et al. (2020) state that altruism is an antecedent of knowledge-sharing intentions, claiming that it is positively associated with the continuance of knowledge-sharing intentions. Barghouti et al. (2022) define altruism as an intentional, voluntary behavior that does not anticipate anything in return. Based on the results of Oliver and Kandadi (2006), the expression of positive leadership characteristics at various levels of management is a vital aspect in developing a KC in organizations. Brown and Treviño (2006) claim that authentic, transformational, servant and spiritual leaders are motivated by altruism (rather than self-interest) and demonstrate genuine care and concern for others (Mallén et al., 2015). AL is defined as guiding others toward the ultimate goal of improving their well-being. Altruistic leaders emphasize employees' needs and sacrifice self-interest to benefit them. By drawing on subordinates' ideals and emotions, altruistic leaders seek to motivate them to develop dedication and passion (He & Wei, 2022; Salas-Vallina et al., 2018).

According to Kanungo and Mendonca (1996), altruistic leaders are much more effective than selfish leaders, who are likely to create a cooperative and trustworthy atmosphere that encourages participation and experimentation and facilitates learning and risk-taking. Research has shown that individual-focused empowering leadership can improve the relationship between supervisors and subordinates and inhibit knowledge hiding (Lin et al., 2020). Altruistic leader behavior encourages the learning of individuals and teams (Fry et al., 2005). Dinh et al. 2014, (p. 42) posit that most existing theories, including transformational leadership, fail to investigate altruistic leader behaviors sufficiently. This idea can be further examined in the context of the broaden-and-build theory, which states that experiences of positive emotions broaden people's momentary thought-action repertoires and increase the likelihood that they will help those in need (Abdillah et al., 2022). Social exchange theory is the second most well-known and fundamental concept, positing that people interact with others based on a self-interested assessment of the costs and benefits of such interactions (Jahan & Kim, 2021). In this study, both general approaches influenced the knowledge-hiding aspect. Some empirical research links altruistic behavior with the performance of individuals and teams (Mallén et al., 2015). Research on AL and knowledge-hiding behaviors is limited to the best of our knowledge. According to Obrenovic et al. (2020), altruistic individuals are receptive to the needs of others, consider the expectations of relevant others, and tend to seek insights. Because of this outward

orientation, they conformed to existing social norms. Altruistic individuals share knowledge with other members when team norms require such knowledge. Yao et al. (2023) state that as knowledge hiding rises, other colleagues may feel that the "altruistic" individual —who usually proactively shares his/her knowledge—is not as trustworthy as they thought, generating negative thoughts about the knowledge sharer. In addition, altruism contributes significantly to members' willingness to continue sharing knowledge (Zhang et al., 2010). Therefore, altruistic leaders should foster a positive work environment in which employees will be open to sharing their knowledge and will not tend to hide their knowledge from coworkers. According to Abdillah et al. (2022), AL has two functions in preventing knowledge-hiding behaviors. First, it acts as a positive affective experience for subordinates, which can induce positive emotions, preventing them from engaging in knowledge-hiding behaviors. Second, subordinates may perceive AL as a unique socio-emotional resource, establishing a high-quality relationship between the leader and subordinates and potentially preventing them from engaging in knowledge-hiding behaviors. Based on the literature review, this study developed the following hypotheses:

H1. AL positively affects KC within the organization.

H2. AL negatively affects RH in knowledge hiding within the organization.

H3. AL negatively affects FI in knowledge hiding within the organization.

These hypotheses were formulated based on the expectation that AL fosters an environment of high trust and openness among employees, reducing the likelihood of knowledge-hiding behaviors while promoting collaborative knowledge-sharing within teams.

Team learning and knowledge hiding

Acquiring, sharing, and integrating new knowledge from outside and inside a company results in organizational learning (Crossan et al., 1999). Some scholars have argued that an organization's only source of sustained competitive advantage is its individual members' collective knowledge and experience (Argyris & Schön, 1978; Kohli et al., 1998). In this knowledge-intensive age, knowledge sharing is a crucial learning tactic for maintaining one's knowledge and abilities. It often goes beyond a one-way transfer of knowledge, leading to reciprocal learning through feedback on the usefulness of the knowledge received (Lu et al., 2012). Knowledge hiding can lead to communication errors and insufficient feedback-seeking, resulting in a lower quality of TL, as newly acquired knowledge is less effective (Zhang & Min, 2019). Studies have also revealed that knowledge hiding significantly impairs absorptive capacity and TL (Fong et al., 2018; He et al., 2021; Zhang & Min, 2019). Based on the literature review, the following hypotheses are presented:

H4. TL negatively affects the dimension of RH in knowledge hiding.

H5. TL negatively affects the dimension of PD in knowledge hiding.

These hypotheses aim to explore how team learning affects knowledge-hiding behaviors among employees.

Altruistic leadership and its relationship to team learning

Compared with other human-centered leadership styles (such as spiritual, authentic, ethical, and servant leadership), AL places a strong emphasis on subordinates' needs and demonstrates a willingness to sacrifice self-interest to support them (Abdillah et al., 2022; Salas-Vallina et al., 2018). The proponents of these principles argue that leaders whose actions embody AL can empathize with employees, ultimately preventing them from hiding their knowledge. Altruistic behavior is conceptually described as a person's propensity to engage in voluntary acts that benefit others by putting aside selfish interests without anticipating benefits (Abdillah et al., 2022). Altruistic leaders prioritize subordinates' well-being over their own, demonstrating self-care for welfare (Abdillah et al., 2022; Barbuto & Wheeler, 2006). Therefore, altruism within organizations may enhance participatory decision-making, a crucial component of the learning process. Partner communication is promoted when someone willingly helps or cooperates in a task. Altruistic actions increase the likelihood of contact and interaction with others because they are intended to help or collaborate (Guinot et al., 2016). Thus, organizations that foster an altruistic culture seem to support learning, which is closely associated with resilience (Barghouti et al., 2022). This suggests that a shared aspect of leadership, such as altruism, might be present in most leadership styles and could be a key factor in promoting learning (Salas-Vallina & Alegre, 2018). Leadership style is one of the aspects mentioned in the organizational learning literature that identifies it as essential for developing organizational learning or organizational learning capability (Berson et al., 2006). Based on the literature review, the following hypothesis is proposed:

H6. AL positively affects TL within the organization.

Formulated hypotheses aim to explore how altruistic leadership affects team learning.

Team learning, its relationship with knowledge culture, and their mediation effect on knowledge hiding

TL is a process in which a group of team members reflects on feedback and adjusts for improvement (Bucic et al., 2010; Edmondson, 1999). In the literature, organizational learning is presented in two main ways: learning as a process and learning as an outcome (Edmondson, 1999). From a process perspective at the group level, learning is *"an ongoing process of reflection and action, characterized by asking questions, seeking feedback, experimenting, reflecting on results, and discussing errors or unexpected outcomes of actions"* (Edmondson, 1999, p. 353). According to studies emphasizing learning as an outcome, TL is defined as *"the extent to which organizational learning processes can improve the understanding of market conditions, project management, and technology innovation"* (Zhang & Min, 2019, p. 228). Research on task mastery suggests that TL is an outcome of collaboration and communication, which increases team members' shared understanding of tasks, resources, teams, and contexts. This field of study examines how teams use each other's skills and knowledge to increase the quantity and quality of knowledge available for task execution (Edmondson et al., 2007). However, Edmondson et al. (2007) also state that TL is a useful abstraction that does not imply innovative products or product development. According to Zhang and Min (2019), TL partially mediates the association between knowledge hiding and project team performance.

KC is a set of norms and practices that create conditions for knowledge flow within an organization, thereby supporting knowledge processes (Islam et al., 2015; McDermott & O'Dell, 2001). Moreover, according to the knowledge management literature, several elements influence the creation and development of a KC. These include organizational structure, people, reward systems, leadership, business processes, and information systems (Drucker, 1999; Gupta & Govindarajan, 2000; Long & Fahey, 2000; Wenger et al., 2002). Oliver and Kandadi (2006) proposed a ten-factor framework to develop an organizational KC. These factors are as follows: leadership (employee empowerment and leadership at all managerial levels), evangelization (communication of KM benefits), infrastructure (knowledge system), physical environment (shared spaces), reward systems (recognition of employees' KM initiatives by providing incentives), process management (optimization of KPIs for KM), communities of practice (collaborative infrastructure and support of physical events within the company), recruitment (hiring employees

with a knowledge-sharing aptitude), time allocation (dedicating time for knowledge sharing and creation), and organizational structure (hybrid structures with functional roles). The authors propose managing all these factors to foster an organization's KC. The above shows how complex the KC is and how many factors must be controlled to ensure successful knowledge management practices. The following hypothesis is based on the review of the literature:

H7. TL positively affects KC within the organization.

Formulated hypotheses aim to explore how team learning affects knowledge culture in the organization.

Mediators between altruistic leadership, rationalized hiding, and playing dumb

According to Oliver and Kandadi (2006, p. 8), *KC is "a way of organizational life that enables and motivates people to create, share, and utilize knowledge for the benefit and enduring success of the organization*." Other authors define KC as organizational beliefs and values that can facilitate or hinder knowledge processes (Intezari et al., 2017). Serenko and Bontis (2016) state that a solid organizational KC supports desirable knowledge behaviors. They further added that the availability of organizational knowledge management systems and policies alone does not reduce knowledge-hiding behaviors; rather, a KC may reduce such negative behaviors. According to Intezari et al. (2017), KC includes knowledge management processes such as sharing, storage, and implementation. As Connelly et al. (2012) state, a knowledge-sharing culture has been closely linked to the extent to which organization members can accept and adopt knowledge-hiding behavior (He et al., 2021).

Long and Fahey (2000) found that knowledge and culture are linked in organizations. Managers should first understand how organizational culture influences knowledge-related behaviors to influence knowledge use, sharing, and creation effectively. Moreover, the authors identified four frameworks linking culture and knowledge, which can be used as tools for analyzing how an organization's culture affects knowledge-related behaviors (Table 1).

According to the literature, AL can significantly influence knowledge-hiding behaviors. As noted in previous chapters, AL might be present in most leadership styles and is a key factor in promoting a learning context within an organization (Salas-Vallina & Alegre, 2018). When AL is present within a team, it contributes positively to developing a KC, and this positive influence is facilitated or mediated by the team's capacity to learn together. Kucharska and Rebelo (2022) noted that establishing a culture that prioritizes learning is crucial for facilitating the continuous flow of knowledge throughout an organization. Other authors have argued that a learning culture supports knowledge creation. Therefore, when connected to AL, TL can influence employees' knowledge-hiding behaviors. Based on the literature, the study proposes the following hypoteses:

H8. KC negatively affects RH in knowledge hiding.

H9. KC negatively affects PD in knowledge hiding.

H10. TL mediates the relationship between AL and KC**.**

H11. TL mediates the relationship between AL and RH.

H12. TL mediates the relationship between AL and PD.

H13. TL mediates the relationship between AL and PD through KC.

H14. TL mediates the relationship between AL and RH through KC.

Concerning the formulated hypotheses, we construct a conceptual model showing the relationships between the constructs (Fig. 1).

Fig. 1 includes all relationships and constructs used to test the 14 hypotheses above. The mediators of TL and KC were the main elements of the proposed conceptual model based on a systematic literature review and were tested further in Chapter 4. In order to support the conceptual model presented in Fig. 1, Table 2 provides a summary of developed hypotheses.

This literature review highlights the importance of AL, TL, KC, and knowledge-sharing behaviors in eliminating individuals' knowledge-hiding tendencies. The next chapter presents the detailed methodology used to test the formulated hypotheses, including data collection from Slovakian companies and the measurement tools applied to explore the hypotheses. Following this, the chapter presents the outcomes of structural equation modeling, offering insights into the relationships between leadership, TL, and knowledge-hiding behavior and the mediating effects identified in the study.

Methodology

Data collection and sample

This study collected data from Slovakian companies to test its research hypotheses. A back-translation procedure translated the questionnaire from English to Slovak and back to English. Data were collected through a questionnaire survey of the employees and managers of the selected companies. An internal company database was used to obtain contact information from respondents. More than 70,000 respondents from Slovakian companies across various

Table 1
Frameworks in which culture influences knowledge-related behaviors.

Frameworks linking culture and knowledge	Short description	Managerial action
1/ Culture shapes assumptions about which knowledge is important	Culture and subculture influence what knowledge is perceived as beneficial, useful, important or valid.	Managers should, therefore, explore how cultural priorities may or may not support the effective creation and sharing of knowledge.
2/ Culture mediates the relationship between levels of knowledge	Culture embodies the norms and rules about the distribution of knowledge among individuals and within the organization, dictating which knowledge remains with individuals and which belongs to the organization.	Managers should evaluate knowledge management approaches and initiatives to identify whether the current situation supports the distribution and sharing of knowledge.
3/ Culture creates a context for social interaction	Culture shapes the context for social interactions and behaviors in which people communicate, determining how knowledge will be used and shared in different situations.	Managers should therefore identify whether any barriers in organizational norms and practices shape the context for social interactions. As for example, tacit knowledge heavily relies on in-person social interactions.
4/ Culture shapes creation and adoption of new knowledge	Organizations not only create or adopt new knowledge in various forms, but knowledge needs to be also distributed and legitimated in order to respond faster than rivals.	In this case, managers should motivate employees to seek essential new knowledge from external sources or to create new knowledge internally.

Source: Authors' elaboration based on Long and Fahey (2000).

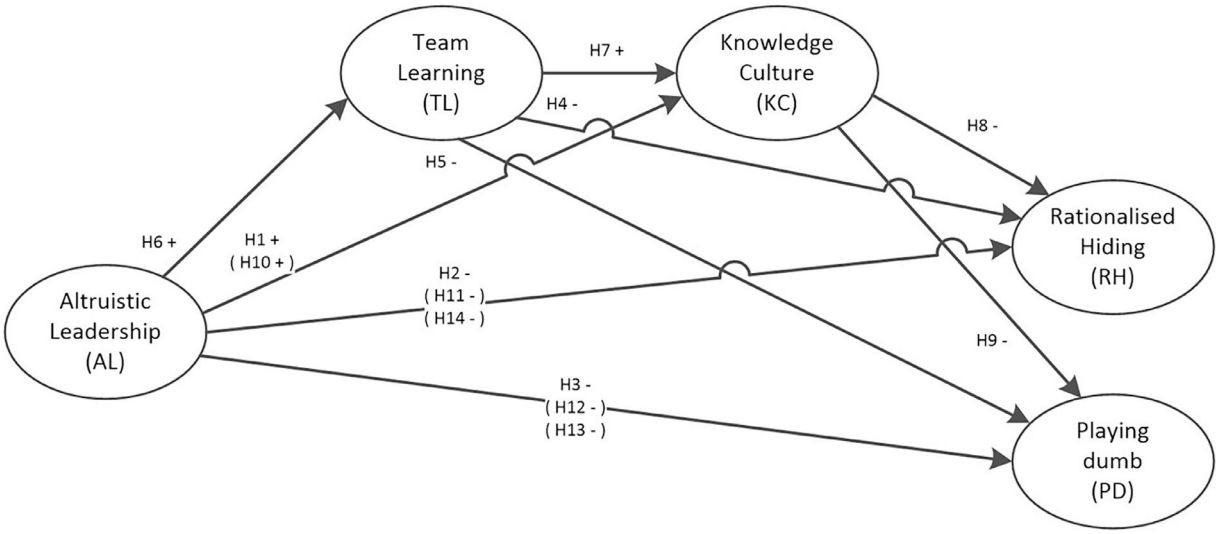

Fig. 1. Conceptual model of the study.Source: Authors' elaboration.

industries were contacted. Data were obtained from the electronic distribution of surveys. The final sample comprised 368 participants who completed the questionnaires between May and October 2023. A further description of the sample is provided in the Results section. The response rate was 0.6 percent. The control variables used to structure our respondents were the size of the organization (SIZE), sector (SECTOR), region (REGION), level of job position (POSI), years of experience (EXPER), years of working in a given position (SENI), sex (SEX), age (AGE), type of employment (EMPLOY), and education (EDU). The control variables were adopted from Ma et al. (2020) and Ali et al. (2021).

Indicators and measures

Data were collected as part of a more extensive study of knowledge-hiding behaviors. The questionnaire measured 12 factors: EH, PD, RH, KC, workplace friendships, AL, trust, task conflict, interpersonal conflict, specific goal achievement, TL, and team performance. These factors were measured using 51 items, in addition to ten items related to the qualification characteristics of the respondents (SIZE, SECTOR, REGION, POSI, EXPER, SENI, SEX, AGE, EMPLOY, and EDU). To ensure the content validity of the scales, previously validated survey questions were used with some modifications to fit our context.

As mentioned, the survey included 12 factors; all measured constructs are listed in Table 3. The authors measured knowledge hiding, classified into three dimensions—EH, PD, and RH— using 12 measurement indicators (four for each dimension). All factors were evaluated on a 7-point Likert scale adapted from a literature review based on previous research. The Likert scale ranged from 1 (strongly disagree) to 7 (strongly agree) and for the other measured factors, from 1 (never) to 7 (always).

In summary, this chapter presents an overview of the data collection process. It constructs measured in a study focused on knowledge-hiding behavior within organizations. The tools were adapted from previously validated scales to ensure the validity of the study's content. The next section presents the results of the structural equation modeling and descriptive statistics.

Results

Descriptive analysis

Before the structural equation modeling, a descriptive analysis was performed. Of the 398 respondents, 203 were male (55.16%) and 165 were female (44.84%). Half of the respondents were between 41 and 60 years old (54.34%), and 80 were older than 60 (21.74%). As

Table 2
Hypotheses of the conceptual model.

Hypotheses	Statement	Literature review outcomes	Expected outcome
H1	AL positively affects KC within the organization.	Supported by research conducted by Abdillah et al. (2022); Lin et al. (2020); Yao et al. (2023); Zhang et al. (2010)	Positive
H2	AL negatively affects the dimension of RH in knowledge within the organization.		Negative
H3	AL negatively affects dimensions, such as PD in knowledge hiding within the organization.		Negative
H4	TL negatively affects the dimension of RH in knowledge hiding.	Based on literature linking knowledge hiding, absorptive capacity, and TL (Fong et al., 2018; He et al., 2021; Zhang & Min, 2019)	Negative
H5	TL negatively affects the dimension of PD in knowledge hiding.		Negative
H6	AL positively affects TL within the organization.	Literature suggests a link between altruistic actions and interaction and, therefore, learning from others Barghouti et al. (2022); Guinot et al. (2016)	Positive
H7	TL positively affects KC within the organization.	Supported by Edmondson et al. (2007)	Positive
H8	KC negatively affects the dimension of RH in knowledge hiding.	Based on findings by He et al. (2021), Intezari et al. (2017), Serenko and Bontis (2016)	Negative
H9	KC negatively affects the dimension of PD in knowledge hiding.		Negative
H10	TL mediates the relationship between AL and KC.	Based on Salas-Vallina and Alegre (2018), Kucharska and Rebelo (2022)	Positive
H11	TL mediated the relationship between AL and RH.		Negative
H12	TL mediates the relationship between AL and PD.		Negative
H13	TL mediates the relationship between AL and PD through KC.		Negative
H14	TL mediates the relationship between AL and RH through KC.		Negative

Source: Authors' elaboration. *Note*: AL=altruistic leadership, PD=playing dumb, KC=knowledge culture, RH=rationalized hiding, TL=team learning.

Table 3
Study constructs.

Constructs	Adopted from	Sample item
Evasive hiding	Connelly et al. (2012), Ma et al. (2020), Albana and Yeşiltaş (2022), Losada-Otálora et al. (2020) and Koon (2022)	I agreed to help others but never really intended to.
Playing dumb	Connelly et al. (2012), Ma et al. (2020), Albana and Yeşiltaş (2022), Losada-Otálora et al. (2020) and Koon (2022)	If my colleague asked me, I pretended I did not know the updated information.
Rationalized hiding	Connelly et al. (2012), Ma et al. (2020), Albana and Yeşiltaş (2022), Losada-Otálora et al. (2020) and Koon (2022)	Explained that I would like to tell him/her, but was not supposed to.
Knowledge culture	Kucharska and Bedford (2020)	We are encouraged to share knowledge, ideas, and thoughts.
Altruistic leadership	Eisenberger et al. (2001), Abdillah et al. (2022) and Barbuto and Wheeler (2006)	My supervisor puts my best interests ahead of his/her own.
Team learning	Zhang and Min (2019), Lee et al. (2012) and Bartsch et al. (2013)	The knowledge acquired from this project provided new insights into executing business processes.

Source: Authors' elaboration.

shown in Table 4, most respondents (292; 79.35%) stated they had more than 15 years of work experience. Similarly, most respondents were from micro-enterprises (44.57%). In our context, microenterprises employ up to ten employees.

Most respondents, 281 (76.4%), had a university degree, whereas 79 (21.47%) had graduated from secondary school with a leaving exam. In terms of the management level within the company, 155 respondents (42.12%) occupied top management positions, 80 (21.74%) were in middle management positions, and 43 (11.68%) had lower management positions.

Constructs

The constructs defined in our model were not collected directly from the respondents. Instead, factors (constructs) were defined as latent variables and their values were collected indirectly through individual questions (items). This procedure resulted in more reliable data. The first step was to create a conceptual model that defined individual latent constructs and specific questions belonging to them defined latent constructs. The proposed model includes five latent factors (AL, TL, PD, KC, and RH). The four constructs (AL, KC, PD, and RH) were defined using four items each, while the TL construct was defined using five items. Questions defined for each latent factor were included in the questionnaire.

Table 4
Descriptive statistics of the sample.

Control variable	n	%
Sex		
Male	203	*55.16%*
Female	165	*44.84%*
Age		
20–30 years	24	*6.52%*
31–40 years	63	*17.12%*
41–50 years	110	*29.89%*
51–60 years	90	*24.46%*
Less than 20 years	1	*0.27%*
More than 60 years	80	*21.74%*
Education		
Bachelor's degree	14	*3.8%*
Master's degree or higher	267	*72.55%*
Secondary school with matriculation	79	*21.47%*
Secondary school with apprenticeship	7	*1.9%*
Primary	1	*0.27%*
Position		
General staff	90	*24.46%*
*Junior manager (*i.e. *team leader)*	43	*11.68%*
Middle management	80	*21.74%*
TOP management	155	*42.12%*
Experience		
11–15 years	27	*7.34%*
15 years and more	292	*79.35%*
2–5 years	18	*4.89%*
6–10 years	28	*7.61%*
Less than 1 year	3	*0.82%*
Company size		
Small enterprise (less than 50 employees)	114	*30.98%*
Microenterprise (0 - 10 employees)	164	*44.57%*
Medium-sized enterprise (50 to 249 employees)	67	*18.21%*
Large enterprise (more than 250 employees)	23	*6.25%*

Source: Authors' elaboration.

To avoid problems related to the multicollinearity of indicators (items), dependency analysis was conducted using the variance inflation factor (VIF). VIF values for the indicators of the defined constructs were calculated for all items together because of the incorporation of the common latent factor, with VIF values greater than five considered problematic (James et al., 2013; Menard, 2001; Quinn and Keough, 2007). The VIF values, calculated for all items together, ranged from 1.380 to 5.824; three items had a VIF score above 5: AL3 (5.701), TL2 (5.824), and TL3 (5.292). For this reason, items AL3 and TL2 were removed from the individual factors. After recalculating the VIF of the adjusted factors, the VIF for all items ranged from 1.377 to 3.797, indicating that the problem of collinearity between the independent variables was resolved. Other procedures, including bias tests, were performed using this revised model.

Bias tests

Before the CFA analysis and SEM modeling, respondent bias was tested. Because the individual data were stored in the file according to how they were obtained, the authors conducted a non-response bias test by dividing the data into two equally large parts based on the order in which the data were collected. Subsequently, the Shapiro-Wilk test was performed for all items of the individual factors to determine whether the data showed a normal probability distribution. As the hypothesis of normality was rejected, the Mann-Whitney U test was used to compare the answers to all items. Statistical differences were tested for all the items. Of the 19 tested items, at an alpha level of 0.05, in 17 indicators, no statistically significant differences were found between the tested observation groups in 19 items ($p > 0.05$). At alpha = 0.10 level, in 16 indicators, no statistically significant differences were found between the tested observation groups for the 19 items, and statistical differences between answers were identified for items RH1 ($p = 0.0141$), RH2 ($p = 0.0090$), and TL4 ($p = 0.0714$). These findings were not considered high attention in the context of the entire test. Therefore, the authors decided to keep the data in the same form for CFA and SEM modeling purposes. A more detailed explanation can be found in the Limitations section.

In addition to the test for nonresponse bias, a test for the possible identification of common method bias (CMB) was conducted. Harman's one-factor test was used to detect the common method bias. One factor was modeled as part of the EFA, which included all indicators. According to Podsakoff and Organ (1986) and Fuller et al.

(2016), common method bias arises when a single factor explains at least 50 percent of the variance. Based on the results, there was no common method bias because the explained variance of a single factor was 33.97 percent, which is less than the recommended value of 50 percent. A single-factor test was also performed using CFA, in which a CFA model with a single factor was created by assigning all indicators to it. The model achieved unacceptable values of fit measures (Comparative Fit Index - CFI = 0.428, AGFI = 0.405), indicating no common method bias.

Due to the limitations of the Harman one-factor test, the authors additionally conducted a test using the Common Latent Factor (CLF) within the CFA framework to confirm the absence of CMB further. The principle was to add a new uncorrelated factor to the CFA model, with this factor containing all the defined items of our model. By comparing the factor loadings, it was found that in three cases out of the 19 cases, the differences were significantly different from those of the original model. The fit measures also increased slightly with CLF (delta CFI = 0.0276, delta Root Mean Square Error of Approximation (RMSEA) = −0.0168, delta Standardized Root Mean Square Residual (SRMR) = - 0.0104). Additionally, in the two cases, the values of the factor loadings were significantly different (diff > 0.200) compared to the original model without CLF. Moreover, the chi-square difference test identified a significant difference between the tested models ($p < 0.001$). Therefore, the conceptual model was modified in the next phase to include a common latent factor with direct relationships with all indicators to eliminate CMB. The CLF factor was defined as uncorrelated with other constructs. The factor loadings between the items and the CLF factor were not equal; in our model, it was assumed that the CLF could influence different indicators. The authors subsequently subjected the CMB-corrected CFA model to further investigation and validation.

Confirmatory factor analysis

To confirm the correctness of the composition of the individual factors in our conceptual model, confirmatory factor analysis (CFA) was conducted. This chapter aims to confirm whether the proposed items for each factor capture individual factors sufficiently well. The results of the CFA did not include the CLF factor, as this factor was incorporated into the model only because of common method bias.

The CFA model was based on the conceptual model defined above but did not include individual linkages between latent factors at this stage. A confirmatory factor analysis (CFA) was implemented in R using the Lavaan library. CFA assessed several aspects of the model: the statistical significance of model parameters, internal consistency of scales, convergent validity, and discriminant validity. The CFA fit measures were used to evaluate the accuracy of the defined CFA model.

The CFA model was quantified using the variance standardization method; all constructs' variances were fixed at one. After model quantification, statistical significance was assessed to verify whether the items were appropriate for defining the latent variables. We verified the statistical significance of each item for its respective latent factors. For all items related to the standard factors, the statistical significance of each item for the respective factors was strong (p-value < 0.001). However, when analyzing the statistical significance of items belonging to a common latent factor, the findings showed that some items were not statistically significant. Consequently, we removed items KC1, KC2, RH1, and RH2 from the definition of the CLF factor. All other items were significant, at least in alpha = 0.05. Based on these findings, the authors of this paper assumed that not all items were affected by common method bias.

The internal consistency of the scales for the five factors (excluding CLF) was assessed to verify whether the individual items were consistent within the selected group, that is, how consistent the individual items were as a group defining the factor. The internal consistency of the scales was measured using Cronbach's alpha with a threshold value of 0.70, which is widely considered desirable (Taber, 2018) as a cut-off value for verifying consistency. The mean of the five internal scales tested was 0.8353, with Cronbach's alpha values ranging from 0.7417 (RH) to 0.8911 (TL).

According to some authors, McDonald's omega is a better indicator of the internal consistency of scales than Cronbach's alpha (Trizano-Hermosilla & Alvarado, 2016). The mean value of the McDonald's omega coefficient for the five defined factors was 0.8493, with a minimum value of 0.7986 (RH factor) and a maximum value of 0.9018 (TL factor). Moreover, when evaluating the internal consistency of the scales using McDonald's omega coefficient, the omega2 metric from the semTools package in R was used. Flora (2020) states, "omega2 is calculated using the model-implied variance of the total score in its denominator." The mean value of the McDonald's omega2 coefficient for the five defined factors was 0.8009, with a minimum value of 0.7602 (FI factor) and a maximum value of 0.8510 (KC factor). All omega values were compared using a threshold value of 0.70.

To test whether individual items correlated with other items within the same common construct (i.e., whether individual items within the same latent variable converged), the convergent validity of the CFA model was assessed using the Average Variance Extracted (AVE) metric. The AVE values were calculated as the sum of the squared factor loadings divided by the number of indicators. A threshold of 0.50 was considered for individual AVE values (Bentler, 1990), indicating that the construct should explain at least 50% of the variance of the indicators. The AVE values were above this threshold for the KC, FI, TL, and AL factors. However, the AVE value for the RH factor was 0.4458, below the threshold, indicating a potential issue.

According to some authors (Wei & Nguyen, 2020; Hair et al., 2009), the convergent validity of a model can also be assessed using standardized factor loadings. The standardized factor loadings except CLF were above 0.50, except for FI4 and RH4. Moreover, the composite reliability index was calculated for each construct to check the convergent validity further. The composite reliability indices ranged from 0.7526 (RH factor) to 0.8595 (AL factor), which were above the accepted threshold value of 0.60 (Hair et al., 2014; Bagozzi & Yi, 1988). The model was retained despite the AVE value being below the threshold in one case and the standardized factor loadings being below 0.50 for two items. As Fornell and Larcker (1981) reported, if the AVE value is less than 0.50 but the composite reliability indices are greater than 0.60, the convergent validity of the construct may still be adequate.

The next part of the CFA tested the extent to which the individual latent variables differed, that is, to validate discriminant validity. Discriminant validity checks whether individual latent variables measure different aspects and whether they are dissimilar. Discriminant validity was tested in several ways. Although the chi-square test comparing our free model with constrained models, where correlations between two selected latent factors were set to a cutoff value of 0.80—could not be performed (likely because of the identification of a common latent factor variable), discriminant validity was tested using other methods. The discriminant validity of the CLF construct was not evaluated.

First, the correlation values between latent factors should not exceed a defined threshold to confirm discriminant validity. The threshold was set at 0.85 (Garson, 2002; Kenny, 2016). From Table 5, it can be concluded that the maximum correlation value between the latent factors was 0.590 (KC-TL). Based on this, the model satisfied the discriminant validity criterion.

The accuracy of the discriminant validity of the model was also confirmed using the calculated Fornell-Larcker criterion (Fornell and Larcker, 1981). Within this criterion, the correlations between the constructs were compared with the square root of AVE. Table 6 presents a matrix of these values, with the square root of the AVE values shown on the diagonal. The values of the inter-factor correlations

Table 5
Correlation matrix of latent variables and internal consistency measures (Cronbach's alpha on diagonal).

	Mcdonald's omega	AL	TL	KC	PD	RH
AL	0.874	(0.875)	0.374***	0.425***	−0.132**	−0.167***
TL	0.902	0.374***	(0.891)	0.590***	−0.263***	−0.008
KC	0.870	0.425***	0.590***	(0.859)	−0.315***	−0.112*
PD	0.803	−0.132**	−0.263***	−0.315***	(0.810)	0.257***
RH	0.799	−0.167***	−0.008	−0.112*	0.257***	(0.742)

Source: Authors' elaboration. *Note*: AL=altruistic leadership, PD=playing dumb, KC=knowledge culture, RH=rationalized hiding, TL=team learning.

Table 6
Discriminant validity (Fornell-Larcker criterion).

Constructs	AL	TL	KC	PD	RH
AL	**0.821**				
TL	0.374	**0.759**			
KC	0.425	0.590	**0.777**		
PD	−0.132	−0.263	−0.315	**0.764**	
RH	−0.167	−0.008	−0.112	0.257	**0.668**

Source: Authors' elaboration based on Fronell and Larcker (1981). *Note*: AL=altruistic leadership, PD=playing dumb, KC=knowledge culture, RH=rationalized hiding, TL=team learning.

were lower than the square root of the AVE for all factors tested, reaffirming the acceptance criterion for discriminant validity.

To confirm the discriminant analysis, this aspect of the model was validated using the Heterotrait-Monotrait Ratio (HTMT) matrix proposed by Henseler et al. (2015). The HTMT matrix evaluates the number of subsumed individual factors. It is assumed that the individual factors are not very similar. A threshold value was used to evaluate this property. When evaluating discriminant validity, a threshold value of 0.85 was used (Kline, 2011) to distinguish between discriminant validity and factor invalidity. In our case, the values in the HTMT matrix among the five latent variables (the common latent factor was excluded from these results) ranged from 0.171 to 0.630 (TL-KC). These values were below the threshold, confirming that all observed factors were discriminant-valid. This test confirmed the discriminant validity of the CFA model.

In addition to testing the validity of the various aspects of the CFA model, accuracy measurements were performed using fit measures. Regarding accuracy, the model was verified using two types of fit measures: absolute and relative. The reported values of our model were compared with the defined threshold values listed in Table 7.

The only problematic metric was the chi-square test, which confirmed a difference between the sample-implied covariance matrix and the observed covariance matrix ($p < 0.001$). However, given the test's sensitivity, this result was not unique. The results of the other metrics confirmed the high accuracy of the model. The ratio of the chi-square to the degrees of freedom was 1.708, which was below the cut-off value. The goodness-of-fit index was 0.939, exceeding the defined threshold, and was therefore deemed acceptable. The excellent accuracy of the model was also confirmed by the Standardized Root Mean Residual (SRMR), which was 0.055, below the required value of 0.08. The point estimate of the root mean square error of approximation (RMSEA) was 0.044, with a 90 percent confidence interval ranging from 0.034 to 0.054 (p-value RMSE ≤ 0.05 = 0.843). Relative fit measures were performed satisfactorily. The Comparative Fit Index (CFI) value was 0.976, above the acceptable level of 0.90. Similarly, the other metrics were above the defined threshold values (NFI = 0.946, IFI = 0.977), confirming a good fit for the quantified model.

Table 7
Fit measures and their threshold values for the CFA model.

Statistics	Value
The ratio of chi-square to degrees of freedom (χ^2/df)	≤ 3.0 (Hoe, 2008)
Chi-square	$p > 0.05$
Goodness of fit (GFI)	values close to 0.90 or above
Adjusted goodness of fit (AGFI)	≥ 0.80
Comparative fit index (CFI)	≥ 0.90
Tucker-Lewis index (TLI)	≥ 0.90
Bollen's (1989) Incremental Fit Index	≥ 0.90
Normed fitness index (NFI)	≥ 0.90
Root mean square error of approximation (RMSEA)	≤ 0.08
Standardized root mean residual (SRMR)	≤ 0.09

Source: Byrne (2013), Hair et al. (2019), Hoe (2008)

Structural equation modeling

Structural equation modeling (SEM) was used to test these hypotheses. They are used for several reasons using SEM modeling. First, the SEM is a system of multiple relationships between several variables in which one variable can be simultaneously dependent and independent in a defined system. Second, the SEM model enables the verification of the statistical significance of individual relationships, as it is a model whose purpose is not just prediction. Third, SEM is a white-box model that enables the interpretation of individual relationships. SEM modeling, thus, SEM allows us to assess the effect of one variable on another and the strength of the relationship between variables. Fourth, SEM allows latent variables to be combined into regression modeling through CFA. Finally, because the SEM model forms a system of multiple relationships, it also allows for investigating the indirect effects of one variable on another through mediators within the context of the entire system. This study aimed to examine the impact of AL on employees' knowledge-hiding behavior. SEM modeling enabled us to investigate and analyze indirect relationships, that is, the mediating effects of other factors on the relationship between AL and knowledge-hiding behavior.

In SEM modeling, two basic approaches are used: partial least squares SEM (PLS-SEM) and covariance-based SEM (CB-SEM). CB-SEM modeling was selected as the preferred method because our study focused more on verifying or confirming known theories rather than conducting exploratory research.

A validated CFA model was used to develop a structural equation (SEM) that contained defined regression relationships based on the conceptual model and theory. As previously mentioned, our goal was to determine the statistically significant relationships. If a given relationship was statistically significant, we were interested in its strength. Additionally, we investigated the role of mediators in the model and examined whether our model had mediating effects. Based on the constructed SEM model and the statistical evaluation of individual regression relationships, we proceeded to confirm or reject the hypotheses defined in the conceptual model (Byrne, 2013; Schumacker & Lomax, 2004). The SEM was quantified using the maximum likelihood estimator, the default estimator in the Lavaan R package.

Nine hypotheses are defined in the conceptual model. Based on the theoretical background mentioned in Section 1, we hypothesized that there would be a direct relationship between AL and KC (Kanungo & Mendonca, 1996; Lin et al., 2020; Obrenovic et al., 2020), AL and RH (Abdillah et al., 2022; Obrenovic et al., 2020; Zhang et al., 2010), AL and FI (Abdillah et al., 2022; Obrenovic et al., 2020; Zhang et al., 2010), TL and RH (Fong et al., 2018; He et al., 2021; Lu et al., 2012; Zhang & Min, 2019), and TL and FI (Fong et al., 2018; He et al., 2021; Lu et al., 2012; Zhang & Min, 2019).

Table 8
Results of hypothesized SEM model based on bootstrapped standard errors.

				β	p-value	Hypothesis	(LLCI; ULCI)	R^2	std.β	(sLLCI; sULCI)
H1:	AL	→	KC	0.218**	0.001	Supported	(0.104; 0.357)	40%	0.238	(0.117; 0.354)
H2:	AL	→	RH	−0.088*	0.053	Supported	(−0.194; −0.013)	4%	−0.163	(−0.299;−0.015)
H3:	AL	→	PD	–	0.773	Not supported	–	11%	–	–
H4:	TL	→	RH	–	0.201	Not supported	–	4%	–	–
H5:	TL	→	PD	–	0.224	Not supported	–	11%	–	–
H6:	AL	→	TL	0.238***	< 0.001	Supported	(0.137; 0.358)	14%	0.374	(0.248; 0.493)
H7:	TL	→	KC	0.72***	< 0.001	Supported	(0.525; 0.955)	40%	0.501	(0.373; 0.618)
H8:	KC	→	RH	–	0.217	Not supported	–	3%	–	–
H9:	KC	→	PD	−0.109*	0.021	Supported	(−0.23; −0.038)	11%	−0.252	(−0.421; −0.079)
H10:	AL	→	TL → KC	0.171***	< 0.001	Supported	(0.097; 0.274)	40%	0.187	(0.109; 0.275)
H11:	AL	→	TL → RH	–	0.213	Not supported	–	4%	–	–
H12:	AL	→	TL → PD	–	0.303	Not supported	–	11%	–	–
H13:	AL	→	TL → KC → PD	−0.019*	0.082	Supported	(−0.055; −0.006)	11%	−0.047	(−0.094; −0.013)
H14:	AL	→	TL → KC → RH	–	0.274	Not supported	–	4%	–	–

*** p-value < 0.001.
** p-value < 0.01.
* p-value < 0.10
β: regression coefficients estimates; **LLCI**: lower level of confidence interval of estimate; **ULCI**: upper level of confidence interval of estimate; **R^2**:multiple R-squared (percentage of explained variance)
std.β: standardized regression coefficients estimates; **sLLCI**: standardized lower level of confidence interval of estimate; **sULCI**: standardized upper level of confidence interval of estimate.
Note: AL=altruistic leadership, PD=playing dumb, KC=knowledge culture, RH=rationalized hiding, TL=team learning.
All the factor loadings (excluding CLF) were statistically significant in the model. Regarding the statistical significance of the relationships between the latent variables, four of the nine hypotheses that tested the direct links between constructs were confirmed. Overall, the table indicates that AL significantly impacts KC (β = 0.238; p = 0.001) and TL (β = 0.374, p < 0.001), with TL being a particularly strong mediator in these relationships. KC also has a significant, albeit weaker, influence on certain knowledge-hiding behaviors. According to hypothesis H7, the strongest relationship observed in this study is between TL and KC, with a β =0.501, indicating a strong positive effect (p < 0.001). The implications of these results are discussed in the following subsections.

In addition, we hypothesized several indirect relationships between variables. We hypothesized that a mediation effect would increase (decrease) the strength of individual relationships between latent variables. Based on this theory, we hypothesized the mediating roles of TL and KC factors. Specifically, we hypothesized that in addition to the direct relationship between AL and KC, a relationship through the mediator TL could amplify this relationship (H10). Simultaneously, based on (Drucker, 1999; Gupta & Govindarajan, 2000; DeLong & Fahey, 2000; Wenger et al., 2002), we hypothesized that the mediator TL could have an indirect effect on the AL-KC (H11) and AL-FI (H12) relationships based on (Bucic et al., 2010; Edmondson, 1999). Moreover, since the influence of TL and KC on PD and RH factors (Edmondson et al., 2007; Kucharska, 2021; Zhang & Min, 2019) is also known from theory, we hypothesized a compound indirect effect via the two mediators, TL and KC, on both latent variables (H13 and H14).

The mediators, TL and KC, were the main elements of the proposed and tested conceptual model. We predicted a mediating indirect effect of the TL factor on five hypotheses (H10–H14). We predicted the mediating effect of KC on the three hypotheses tested (H10, H13, and H14). We hypothesized that these two factors would indirectly affect the latent output variables PD and RH. In other words, we hypothesize that TL and KC would have statistically significant effects on the output factors of our model. Thus, these factors can contribute to understanding the importance of these elements in a firm's knowledge-sharing system. Therefore, based on the above indirect effects, we hypothesized that the total effect for the relationships defined by H1 to H5 would be the sum of the direct and indirect effects, where the indirect effects result from the mediators, in our case, mainly TL and KC.

To eliminate the influence of common method bias, we added a common latent factor (CLF) that was uncorrelated with other factors to the model. The CLF factor contained links to all defined items in our CFA model. Due to problems with model identification, we did not limit these links to equal weights. To identify the model, we used the variance standardization method; we standardized the variance of the five constructs and the variance of the common latent factor to one.

We quantified the standard errors using a bootstrapping method based on 5000 bootstrap samples to obtain more robust results. Of the 5000 bootstrap draws performed, 4929 runs were successful, while 71 bootstrap runs failed or did not converge. Thirty-eight bootstrap runs resulted in nonadmissible solutions. Based on the bootstrap results, we calculated the bias-corrected and accelerated lower-level confidence intervals (LLCIs) and upper-level confidence intervals (ULCIs) for the unstandardized parameter estimates. Moreover, we calculated the standardized regression coefficient estimates with percentile confidence intervals. Table 8 presents the results for each conceptual model hypothesis.

Discussion and conclusion

This study analyzed the impact of AL on employees' knowledge-hiding behaviors. Based on the literature review, a conceptual model was created with TL and KC as the main mediators, showing the assumed relationships between the constructs. The model in this study demonstrates both direct and indirect effects and presents a valuable contribution to understanding knowledge-hiding behavior and AL. Our findings contribute to the research on the connection between AL and knowledge hiding by investigating the mediation mechanisms and effects of TL and KC. We test our hypotheses using primary data collected from Slovakian companies in 2023. The direct effects hypothesized in H1, H6, H7, and H9 were confirmed, and the hypotheses were supported. Regarding mediation effects, hypotheses H10 and H13 were supported. The findings of our study are valuable because they explain the relationship between AL and the mediation mechanism that can underpin the elimination of knowledge-hiding behavior, specifically PD and rationalized hiding. The implications of our study for research and practice are also discussed in the following subsection, confirming its contribution to the existing literature through an innovative examination of the direct impact of AL on knowledge-hiding behavior and demonstrating how AL promotes TL and a knowledge-sharing culture, thereby eliminating knowledge hiding. Despite the originality of the study and its valuable findings,

the authors are also aware of the limitations of this study, as presented in Subsection 5.3.

In summary, TL is part of a broader KC within an organization. Learning needs to occur and should be encouraged in larger groups and teams so that people can build new knowledge together. Furthermore, while a learning culture is crucial for organizations, it is only effective when coupled with an implemented culture of knowledge (Kucharska, 2021; Kucharska & Rebelo, 2022). The success of knowledge management practices, including TL and knowledge sharing, depends on fostering a positive KC by managing various factors and processes.

Theoretical implications

Our study extends the knowledge on the role of AL about knowledge hiding and offers several theoretical implications. As mentioned in the literature review, previous studies have confirmed that AL positively impacts organizational culture and performance. Specifically, Abdillah et al. (2022) examined the functions of AL concerning counterproductive knowledge behaviors, such as knowledge hiding. While previous studies have focused on why subordinates hide knowledge, leadership styles that can prevent this behavior have not received sufficient attention. The main contribution of their study is that the direct relationship between AL and knowledge hiding is weak but is mediated by two other factors: leader-triggered positive emotions and leader-member exchange (Abdillah et al., 2022).

Hypothesis H1 was confirmed ($\beta = 0.218$, $p < 0.01$), indicating that altruistic leaders significantly contribute to creating an environment that supports knowledge sharing. This aligns with previous studies highlighting AL's role in fostering team trust and collaboration (Abdillah et al., 2022). Hypothesis H2 was also supported ($\beta = -0.088$, $p = 0.053$), suggesting that altruistic leaders can reduce employees' tendency to withhold information under the pretext that they cannot share, thereby promoting transparency within the organization (Obrenovic et al., 2020). Hypothesis H6 was confirmed with a strong relationship ($\beta = 0.238$, $p < 0.001$), showing that AL significantly positively impacts the TL process. This supports previous research (Barghouti et al., 2022; Guinot et al., 2016), emphasizing that altruistic leaders encourage communication and collaboration, improving TL. This is crucial in environments in which new skills and innovations are required. Hypothesis H7 was strongly supported ($\beta = 0.72$, $p < 0.001$), suggesting that effective team-level learning promotes a broader culture of knowledge sharing within the organization, consistent with Edmondson et al. (2007). A strong KC helps organizations respond to new challenges and utilize internal knowledge more effectively. Hypothesis H9 was confirmed ($\beta = -0.109$, $p = 0.021$), indicating that a strong knowledge-sharing culture can reduce behaviors where employees pretend not to know something to avoid sharing information. This aligns with Serenko and Bontis (2016), who emphasized that a healthy knowledge-sharing culture minimizes willful ignorance and increases transparency. Hypothesis H10 was confirmed ($\beta = 0.171$, $p < 0.001$), showing that TL is a significant mediator between AL and knowledge-sharing culture. AL promotes TL, which, in turn, strengthens knowledge sharing within an organization (Salas-Vallina & Alegre, 2018). Lastly, Hypothesis H13 was confirmed with marginal significance ($\beta = -0.019$, $p = 0.082$), suggesting that AL may indirectly reduce the occurrence of "PD" through the mechanisms of TL and knowledge-sharing culture. Although weak, the effect highlights the importance of TL and culture in improving knowledge sharing and reducing passive-aggressive behaviors in teams.

However, some of the hypotheses were not supported by these results. Hypothesis H3 was not confirmed ($p = 0.773$), suggesting that AL does not significantly reduce "PD" behavior, contrary to expectations and previous studies (e.g., Obrenovic et al., 2020). This may be because factors such as personality traits or organizational norms influence this behavior more strongly than leadership alone. H4 was also not supported ($p = 0.201$), indicating that TL does not significantly reduce rationalized knowledge hiding. This contrasts with previous research (Fong et al., 2018) and suggests that learning within teams might not be sufficient to overcome knowledge-hiding tendencies with additional interventions, such as promoting open communication. Similarly, Hypothesis H5 was not confirmed ($p = 0.224$), meaning that TL does not play a major role in reducing "PD". Individuals may still resort to pretending ignorance due to other factors such as personal motivations or organizational dynamics. Hypothesis H8 is not supported ($p = 0.217$), suggesting that a strong knowledge-sharing culture does not significantly reduce rationalized knowledge hiding. Employees may use rationalized excuses to withhold information even in environments that encourage sharing. Hypothesis H11 ($p = 0.213$) proved that contrary to expectations, TL does not mediate the relationship between AL and rationalized knowledge hiding. This could indicate that AL alone cannot fully eliminate knowledge hiding, which may have deeper individual or organizational roots. Hypothesis H12 ($p = 0.303$) was not supported, indicating that TL does not mediate the relationship between AL and FPD Organizational norms or employee motivation could play a more significant role in reducing this behavior. Finally, Hypothesis H14 ($p = 0.274$) was not confirmed, suggesting that the combination of TL and a knowledge-sharing culture does not significantly mediate the relationship between AL and rationalized knowledge hiding. Employees may still use rationalized excuses for hiding information, even in environments promoting learning and knowledge sharing.

This research provides important insights that contribute to expanding both the theory and practice of knowledge management, while deepening our understanding of the relationship between AL and knowledge-hiding behaviors (e.g., Connelly et al., 2012; Černe et al., 2014, Kucharska & Rebelo, 2022). The authors focused on the role of AL in reducing employees' tendencies to hide information, thus fostering transparency and collaboration within organizations. They also explored the role of TL and KC as mediators in this relationship. The hypotheses confirm that altruistic leaders create an environment that promotes knowledge sharing and TL, indirectly reducing negative employee behaviors such as PD. This leads to better organizational outcomes through effective knowledge-sharing and team collaboration.

The originality of this research lies in examining the relatively unexplored relationship between AL and knowledge-hiding processes, emphasizing mediators such as TL and a knowledge-sharing culture. This approach provides a fresh perspective on how AL positively affects organizational outcomes. Theoretically, this research extends the existing leadership literature by demonstrating how AL fosters a culture of knowledge sharing and TL, reducing negative behaviors such as knowledge hiding. The findings also suggest that other factors such as organizational norms and individual motivations need to be considered to reduce such behaviors effectively.

Practical implications

In addition to theoretical implications, our results provide several insights for managers that could help eliminate the negative effects of subordinates' knowledge hiding. The first is that AL has a direct impact on TL and, consequently, on KC. To build a KC in which knowledge is shared across an organization at the right time, quantity, and quality, focusing solely on teams and internal knowledge sharing is not enough. Our results show that a leader with altruistic traits positively affects TL, manifested by a higher level of KC and a lower level of knowledge hiding (specifically in RH and PD). Therefore, selecting work team leaders should include an evaluation of the degree of altruism among potential leaders.

Second, our results indicate a strong relationship between TL and cultural knowledge. Work teams are crucial for knowledge sharing,

and managers should consider the significant roles of team effectiveness and mutual communication. Third, our study revealed a mechanism affecting one component of knowledge hiding, namely PD. This form of knowledge hiding can be mitigated by systematically building a KC that includes TL and AL.

Finally, our study contributes to practice by providing several recommendations and guidelines for managers to eliminate the knowledge-hiding culture within organizations. First, it emphasizes the direct influence of AL on TL, which fosters a positive KC. Furthermore, the findings highlight the importance of altruism when selecting team leaders to promote effective knowledge sharing. Finally, this study identifies a mechanism to reduce one aspect of knowledge hiding, specifically, the dimension of PD, by systematically cultivating a KC that involves TL and AL.

Limitations

All survey-based studies have certain limitations, and this study is no exception. The first was geography. The data were collected in Slovakia, a country characterized by relatively high societal mistrust. This could have affected the identified relationships' data quality and intensity. Research conducted in culturally different countries with higher trust and willingness to share knowledge could help validate the proposed model. The second limitation was the heterogeneity of the sample. The sample represented a non-stratified set of organizations from different sectors, which could have influenced the results.

Additionally, lower p-values (<0.05) were identified for the two items when testing for non-response bias, indicating statistically significant differences between the groups. Although this may suggest the presence of non-response bias, it does not necessarily confirm the presence of non-response bias in our data. It is unclear why there were statistically significant differences between older and newer respondents in their answers. A closer analysis of the data revealed that among the older responses, there were more answers from respondents from micro and small businesses (147 vs. 131). Conversely, more recent responses came from medium and large enterprises with fewer employees than 50 (37 versus 53). The low p-values in these cases indicate that the method of sharing knowledge related to RH may have been influenced by the size of the companies in which the respondents worked.

Another limitation is the self-reported measurement used for data collection. Respondents' views may not accurately reflect the actual attributes of teamwork. Expanding data collection to include more respondents from a single organization could be a suitable way to mitigate this risk. Our study focuses on three factors that positively impact and can mitigate some form of knowledge hiding. However, several potential factors associated with leadership, such as abusive supervision, humble leadership, and ethical leadership, have not been explored in depth.

In conclusion, our study provides valuable insights into preventing knowledge hiding by considering TL and KC as mediators. Overall, it contributes a new direction for altruistic leaders and organizations to design suitable concepts and strategies for preventing knowledge-hiding behavior among employees and confirms the importance of AL in organizations.

Future research

The relationship between leadership style and knowledge-hiding behavior should be further investigated, and more detailed empirical research is required because there are many variables within both concepts. Special focus should be placed on the influence of different leadership styles and cultural knowledge settings within different organizations. The proposed conceptual model can be tested in more specific sectors where knowledge hiding represents a critical risk of dramatically changing process efficiency (e.g., the IT sector). Future studies can collect data not only at the individual level but also at the team level, for example, from the manager's perspective. The phenomenon of knowledge hiding still represents a strong potential for further research in specific types of knowledge (tacit/explicit), as knowledge hiding probably occurs because of different causes and motives. It is also important to understand and study individual/team/organizational antecedents that could decrease knowledge-hiding behaviors. The authors of this study aim to address some of the identified limitations and explore the proposed research directions for future studies.

Conclusion

This study explored the relationship and influence between AL and employees' knowledge-hiding behavior mediated by TL and KC. The results demonstrate a positive relationship between AL, KC, and TL. Consequently, AL influenced knowledge-hiding behaviors, specifically playing the dumb, by impacting TL and organizational KCs. This indicates that a leadership style combining altruism with a strong learning and KC can effectively prevent or reduce the negative effects of knowledge hiding within organizations.

This study reveals that AL can be a powerful tool for mitigating knowledge hiding by recognizing the values and needs of individual team members and integrating learning through existing and new knowledge. To counteract knowledge-hiding tendencies, leaders must support both knowledge and learning cultures, which, in turn, encourages knowledge sharing. This is vital in developing human capital, organizational growth, and innovation. The results of this study show that the topic opens the potential for further research and investigation. The model created in this study provides a basis for further investigation, including other mediators, factors, and leadership styles and the possibility of broadening the geographical scope of the data sample, on which the assumptions can be further tested.

The findings underscore the overall importance of organizations implementing AL and fostering a supportive culture as actionable approaches to promoting a culture of information sharing.

Data availability statement

Data are available upon request.

Declaration of competing interest

No potential conflict of interest was reported by the authors.

CRediT authorship contribution statement

Tereza Michalová: Investigation, Writing – original draft, Methodology, Formal analysis, Conceptualization. **Kateřina Maršíková:** Resources, Writing – original draft, Conceptualization. **Lukáš Falát:** Investigation, Writing – original draft, Visualization, Data curation. **Peter Madzík:** Writing – original draft, Methodology.

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Appendix A. - Part of the questionnaire related to constructs used in the study

Questions related to knowledge hiding: A Likert scale from 1 (never) to 7 (always).

Evasive hiding	I agreed to help others, but I never intended to.
	When someone asks me for information, I deliberately provide different information than what they wanted.
	I have told others that I will help them later, but I have delayed this help as much as possible.
	I proactively offered others different information instead of what they really wanted.
Playing dumb	I pretended I didn't know the updated information and that I didn't read it.
	I said I didn't know, even though I knew.
	I pretended not to know what he/she was talking about.
	I said I did not know much about the topic my colleague talked about.
Rationalized hiding	I told a colleague that I would have liked to tell him/her the information but I shouldn't have done so.
	I explained to my colleague that the information was confidential and only available to those involved in the specific project.
	I told a colleague that my supervisor forbids sharing certain knowledge.
	I told a colleague that I would not answer his/her questions.

Questions related to altruistic leadership, team learning and knowledge culture: A Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

Knowledge culture	All employees perceive knowledge as valuable.
	We have a common way to promote knowledge sharing.
	We are encouraged to share knowledge, ideas and thoughts.
	We care about the quality of the knowledge shared.
Altruistic leadership	My supervisor puts my interests before his/her.
	My supervisor does everything possible to serve me.
	My supervisor sacrifices his/her own interests to meet my needs.
	My supervisor goes above and beyond the call of duty to meet my needs.
Team learning	Lessons learned from new projects/collaborations allow us to adjust our view of existing practices.
	Knowledge gained from new projects/collaborations allows us to develop our creativity.
	Insights gained from new projects/collaborations provide us with new perspectives on the implementation of business processes.
	Thanks to staff training we have gained a huge amount of knowledge about the market and project management.
	Knowledge gained from new projects/collaborations has provided us with new insights for improving products (services) and technologies.

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