

RESEARCH PAPER

Seeing knowledge hiding through a multi-level lens

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ABSTRACT

This study investigates knowledge hiding (KH), a growing research area of increasing importance across multiple organisational levels. The rapid expansion of KH research runs the risk that existing knowledge is not accumulated but constantly re-invented. Therefore, this study aims to enhance our understanding by systematically reviewing the antecedents, boundary conditions and outcomes of KH. We develop a thematic mapping of 173 papers, identifying key antecedents, boundary conditions and outcomes of KH alongside emerging knowledge gaps and pertinent research questions. Leveraging these insights, we construct a multi-level framework that categorises KH at the micro, meso and macro levels, integrating findings from our thematic analysis. This study provides a consolidated view of KH literature and is a valuable guide for scholars seeking to advance this domain.

KEYWORDS

knowledge, knowledge hiding, systematic review, KH mapping, boundary conditions

Introduction

Organisations' effective use of knowledge as the key to competitive advantage in dynamic business environments is widely recognised (Del Giudice and Maggioni, 2014; Mahdi *et al.*, 2019). In an era when knowledge has become more important than ever, knowledge hiding (KH) has emerged as a critical area of interest in contemporary management research, reflecting its growing relevance in diverse work environments (Hernaes *et al.*, 2019; Almeida *et al.*, 2022; Shirahada and Zhang, 2022; Khelladi *et al.*, 2022). KH influences the flow of information and knowledge within organisations and impacts creativity (Chatterjee *et al.*, 2021; Feng *et al.*, 2022), organisational performance (Zhang, Z. *et al.*, 2022; Moin *et al.*, 2024) and innovative behaviour (Chen *et al.*, 2022; Donate *et al.*, 2022).

The surge in interest is mirrored by a substantial body of literature investigating various facets of KH, ranging from its antecedents and consequences to its broader organisational implications. Furthermore, there are continuous calls for more studies investigating KH in various organisational settings (e.g., Agarwal *et al.*, 2022a; Chen *et al.*, 2022). The recent rapid expansion

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of KH research runs the risk that existing knowledge is not accumulated but instead continuously re-invented. Scholars have attempted to review the available literature and summarise the current body of knowledge. For example, Fauzi (2023) and Zutshi *et al.* (2021) systematically reviewed KH in higher education, while Xiao and Cooke (2019) examined KH from a Chinese context. Anand *et al.* (2022) contributed significantly to KH research by identifying key research streams and focusing on the geographical distribution, company size and level of analysis in KH studies. However, while informative, their approach predominantly focuses on cataloguing and compiling a list of selected antecedents, mediators and moderators within the KH literature. On the other hand, Siachou *et al.* (2021) examined the antecedents and consequences of KH; however, the study is based on only a small sample of 39 papers published between 1998 and 2020. This restricted selection could compromise the robustness of their findings, as it may not fully capture the diversity and complexity of KH.

Given these limitations, we propose conducting a systematic analysis of the literature on KH to map its antecedents, outcomes and boundary conditions in order to identify knowledge gaps that could form the basis for promising new research areas. Based on this aim, our central research questions are: RQ1 – What are the antecedents, outcomes and boundary conditions of KH, as identified in the literature? And RQ2 – What are the key knowledge gaps in the literature, and what potential research avenues remain unexplored? A rigorous approach was taken to answer these two questions (Tranfield *et al.*, 2003; Kraus *et al.*, 2020), which included the specification of keywords, inclusion and exclusion criteria, and extensive searches in well-known academic databases. This resulted in a thorough analysis of 173 peer-reviewed papers on KH. In response to RQ1, we mapped the final sample of papers to learn about the antecedents, boundary conditions and consequences of KH using the content analysis method. To answer RQ2, we highlighted research gaps in the current body of knowledge and suggested future research questions for each category. Based on the thematic mapping and identified gaps, we propose a multi-level framework categorising KH at various levels. Such a multi-level perspective is instrumental in advancing theoretical constructs, as it decomposes concepts into basic elements and links them across different levels of analysis (Salvato and Rerup, 2011). The framework is the main contribution of our study, providing a structured approach to understanding KH and outlining promising directions for future research.

The paper is organised as follows. It begins by defining KH and distinguishing it from other constructs, such as knowledge hoarding, knowledge withholding and disengagement from knowledge sharing. Then it summarises the method used in selecting and reviewing the literature and details our search strategy, analysis and evaluation of the studies reviewed. Following this, the findings of our content analysis are presented, gaps in the extant research are highlighted and potential research directions for each category are suggested. A conceptual framework is then present. The paper concludes by summarising the key insights and discussing the limitations of the study.

Knowledge hiding and related constructs

Scholars in the field appear to have reached a consensus on the definition of KH, as evidenced by previous systematic reviews (Siachou *et al.*, 2021; Anand *et al.*, 2022). The prevailing definition is that of Connelly *et al.* (2012, p.65), who view KH as ‘an intentional attempt by an individual to withhold or conceal task information, ideas, and know-how that another person has requested’. Existing research suggests that KH is not necessarily intended to harm a person or organisation, but is a response to a specific situation (Connelly and Zweig, 2015; Xiong *et al.*, 2021; Koay and Lim, 2022). According to Connelly *et al.* (2012), the knowledge hider may pretend they do not possess the knowledge requested (playing dumb), provide incomplete or incorrect information with the promise of complete information in the future (evasive hiding), or offer an explanation for failing to provide information or blame another party (rationalised hiding).

Table 1. Comparing the concepts related to knowledge hiding

Concepts	Knowledge request	Knowledge scope	Intention/behaviour
Disengagement from knowledge sharing	No	Broad (any knowledge)	Low, passive
Knowledge hoarding	No	Broad (any knowledge)	Medium, passive
Knowledge hiding	Yes	Specific	High, active
Knowledge sabotage	Yes	Specific	High, active

Organisations consider KH as counter-productive knowledge behaviour, as they do with disengagement from knowledge sharing, knowledge hoarding, knowledge sabotage and knowledge withholding (Serenko and Bontis, 2016; Rhee and Choi, 2017; Singh, 2019; Serenko, 2019; Afshar-Jalili *et al.*, 2021; Shirahada and Zhang, 2022). Disengagement from knowledge sharing happens when individuals do not actively exchange knowledge with each other, despite having no motivation to withhold it (Ford and Staples, 2008). Knowledge is not shared, not because it is being protected, but simply because it is not being communicated. Knowledge hoarding refers to the intentional gathering of knowledge by employees while hiding that they have relevant knowledge or information at their disposal (Evans *et al.*, 2015; Holten *et al.*, 2016). Compared with KH, knowledge hoarding emphasises that accumulated knowledge may not necessarily be requested by another (Connelly *et al.*, 2012; Zhao and Xia, 2017; Scuotto *et al.*, 2022). Knowledge sabotage is characterised by employees purposely providing incorrect or withholding the right documents, being fully aware of the importance of the knowledge, and understanding that the requester cannot effectively perform job-related tasks without it (Serenko, 2019).

A detailed overview of these related concepts is given in Table 1. Here, the intention/behaviour column denotes the degree of deliberate action taken to conceal knowledge and whether the behaviour involves active effort or is more passive. High intention, active behaviour involves the individual's clear, observable actions, such as deliberately withholding requested information (KH) or intentionally providing misleading information (knowledge sabotage). Low intention, passive behaviour involves less obvious actions or possibly inactions, such as not offering information unless specifically asked (knowledge hoarding) or disengaging from knowledge-sharing activities. Knowledge request refers to whether a request has been received. The scope refers to the breadth of the involved knowledge. For example, in the case of KH, we focus on specific pieces of knowledge and specific requests. Knowledge hoarding has a wider scope than KH: it is a systematic and strategic accumulation and concealment of knowledge. It involves a broad range of knowledge and is not usually tied to specific requests.

In conceptual terms, both KH and hoarding have been characterised as knowledge withholding (Connelly *et al.*, 2012; Kmiecik, 2023). Serenko and Bontis (2016, p.1201) define knowledge withholding as 'intentional concealment and unintentional hoarding of knowledge for personal gain or contributing less knowledge than is needed'. On the other hand, in some papers, knowledge withholding is treated as KH. It is understood to be the denial of requested information (Evans *et al.*, 2015) or an intentional attempt by an individual to conceal knowledge (Peng and Pierce, 2015; Stenius *et al.*, 2016; Anaza and Nowlin, 2017). In these instances, such behaviours are in direct alignment with our operational definition of KH; thus, we treat these actions as KH.

Methodology

For this study, a systematic literature review method was adopted. In order to gather relevant papers for a particular topic and to avoid bias, this systematic review followed a set of predetermined procedures as proposed by Tranfield *et al.* (2003) and Kraus *et al.* (2020). This ensures that the review is reliable, comprehensive and rigorous (Rousseau *et al.*, 2008). The procedure consisted of three

Table 2. Search syntax in knowledge hiding

Search terms
TITLE-ABS-KEY (knowledge hiding OR hiding knowledge OR knowledge hoarding OR knowledge withholding OR knowledge detention OR knowledge concealment OR non-sharing knowledge OR knowledge sharing barrier OR knowledge sharing resistance OR knowledge sharing disengagement OR knowledge sharing obstruction OR knowledge sharing hostility OR knowledge sharing blockage OR counterproductive knowledge behav*)

steps: (1) planning the review, (2) carrying out the review, and (3) reporting the review. The first two are detailed in this section. The final phase is presented separately.

Planning the review

Initially, a research plan was outlined by listing the research questions, database selection, relevant keywords, and the study's inclusion and exclusion criteria. The present systematic literature review aims to map antecedents, outcomes and boundary conditions of KH to identify knowledge gaps that could form the basis for new promising areas of research.

The two most widespread databases, Scopus and Web of Science, were selected to search the KH literature. A thorough overview of the Web of Science and Scopus databases may be found in Birkle *et al.* (2020) and Thelwall and Sud (2022). The main search string consisted of the keyword 'knowledge hiding'. Keywords such as 'knowledge withholding', 'knowledge hoarding' and 'counterproductive knowledge behaviour' were also included to make the initial sample as complete as possible. The final list of keywords was inspired by previous systematic reviews (Siachou *et al.*, 2021; Anand *et al.*, 2022), and a combined keyword search strategy has been performed employing the 'OR' operator to include a range of relevant terms (Table 2).

For further analysis, we included documents such as papers and early access reviews that were published in English, fell into the business and management categories, and were featured in peer-reviewed journals rated 2, 3, and 4 stars according to the Association of Business Schools' *Academic Journal Quality Guide*, 2021. Conversely, we excluded papers published in journals rated 1 star or without a star rating, grey literature such as reports, non-academic research, and documents in languages other than English.

Conducting the review

Some 476 papers were identified from the Web of Science and 643 from the Scopus databases based on abstract, title and keywords. In the second step, the results were narrowed to only the business and management research areas. This yielded 284 papers in the Web of Science and 373 in Scopus databases. In step three, papers not published in scholarly journals were eliminated. As a result, 271 papers were identified in Web of Science and 345 in Scopus. In step four, papers published in languages other than English were removed leaving 271 papers from Web of Science and 343 from Scopus. In step five, only papers published in peer-reviewed journals and graded 2, 3, and 4 stars by the Association of Business Schools were selected for further examination. This reduced the Web of Science dataset to 175 papers and the Scopus dataset to 204 papers. In step six, 170 duplicate papers (i.e., those indexed in both databases) were excluded from consideration, leaving 209 papers. In step seven, the titles, keywords and abstracts of all remaining papers were screened and those that did not deal with KH despite prior filtering were excluded. As a result, after the screening process, the sample consisted of 173 peer-reviewed papers published in 44 leading scientific journals. Figure 1 displays the search and selection processes performed in December 2022.

Database	Scopus	Web of Science
Step 1. Query selection	643 papers	476 papers
Step 2. Subject area: include the papers in business and management area	373 papers	284 papers
Step 3. Document type: include papers or reviews or early access	345 papers	271 papers
Step 4. Language: include the papers in English language	343 papers	271 papers
Step 5. Journal selection: include papers published in journals ranked 2 or higher according to <i>Academic Journal Guide</i> 2021	204 papers	175 papers
Step 6. Remove duplicates	209 papers	
Step 7. Selection after abstract analysis	173 papers	

Figure 1. Search and selection processes

Methods

The selected papers ($N = 173$) were analysed to understand better the various antecedents, consequences and boundary conditions of KH. This synthesis involved a detailed review and content analysis of each paper, drawing upon the methodologies employed in recent systematic literature reviews, such as those by Hassan *et al.* (2023) and Schilke *et al.* (2018). The process involved the two authors independently analysing the studies and then collaboratively discussing their findings to establish agreement on the emerging research themes. In instances of disagreement, a third individual was consulted to provide additional insights, ensuring a unanimous conclusion was reached.

The authors used established coding procedures of open, axial and selective coding procedures to derive the core themes from the accumulated research outlined by Glaser and Strauss (1967). Open coding was used to extract and categorise data from the reviewed studies, while axial coding helped to explore the connections and relationships between the initial categories to develop broader, more encompassing themes. Then, following the established research patterns in KH (Siachou *et al.*, 2021; Anand *et al.*, 2022), the emergent thematic areas were placed into broad categories.

Thematic mapping: summary of findings and discussion

This section presents a thematic mapping of research on KH, as detailed in Figure 2. This includes antecedents of KH (Figure 2, Path A), consequences of KH (Figure 2, Path B) and boundary conditions that influence both the antecedents and consequences of KH (Figure 2, Paths C1 and C2). For example, in Path A, it was observed that many studies examined individual factors (e.g., individual traits, such as a dark triad of personality), interpersonal relationships (e.g., leader–member exchange (LMX), negative workplace gossip, co-worker support), and other organisational factors (e.g., organisational politics, organisational knowledge culture) as focal predictors. In Path B studies, the following were identified: higher-order categories of performance and behavioural outcomes (e.g., innovative behaviour, task performance, creativity), attitudinal outcomes (e.g., well-being, thriving), and employment (e.g., turnover intention, promotability) outcomes. Then, based on the findings, a thematic mapping of KH across the different levels of analysis was carried out. The width of the lines in Figure 2 represents the approximate volume of research in those domains, with thicker lines representing more frequently-studied relationships (the number of studies mentioned in the parentheses). In the following section, an overview is provided of the current state of the art in each area. Possible knowledge gaps in these directions are identified and detailed presentations of each area of research are highlighted in Figure 2.

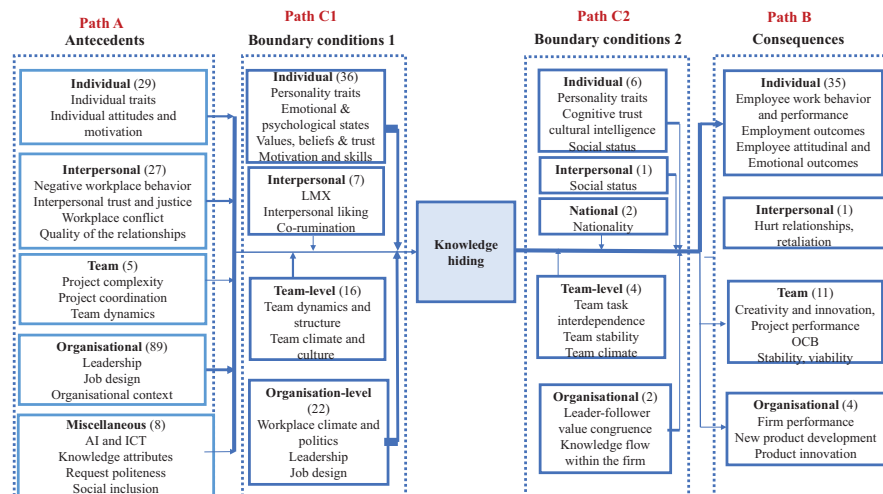


Figure 2. Key thematic areas of research in KH

Path A: antecedents of KH

Appendix 1, A1: individual-level factors

Research findings highlight the significant role of personality traits and individual characteristics. Dark triad traits, such as those identified by Pan *et al.* (2018) and Soral *et al.* (2022), along with a supervisor's bottom-line mentality (Chen *et al.*, 2023), neuroticism (Anaza and Nowlin, 2017), and cynicism (Nguyen *et al.*, 2022), have been shown to promote KH. Conversely, traits like conscientiousness and agreeableness are not significantly correlated with KH (Anaza and Nowlin, 2017; Banagou *et al.*, 2021). Other factors, such as competitiveness, goal orientation and psychological entitlement, also influence the propensity towards KH, as do career stages, with individuals at the beginning or end of their careers showing a higher tendency for KH (Issac *et al.*, 2020). On the other hand, employees' perception of knowledge ownership and motivation significantly influences their tendency towards KH. For instance, employees who perceive knowledge as their own are more likely to hide it, with studies linking this perception to territorial behaviour and counterproductive work outcomes (Pereira and Mohiya, 2021; Shirahada and Zhang, 2022). Career-driven motives, such as indispensability and fear of negative evaluation, drive KH (Butt and Ahmad, 2019; Butt, 2021).

The current literature, thus far, has examined the role of individual characteristics in KH in isolation. The influence of trait combinations, attitudes towards knowledge, and individual motivations on KH are promising areas of study. For instance, the interaction of agreeableness with territoriality could be studied to identify whether this trait buffers or amplifies the relationship between territoriality and KH, or if individuals high in Machiavellianism and a performance-proven goal orientation may show varied KH behaviour. While their manipulative nature might prompt them to hide knowledge for personal advantage, a strong desire to prove competence could also discourage KH, hindering their performance appraisal. Furthermore, incorporating the concept of hostile attribution bias into this analysis could reveal how individuals' predispositions to interpret ambiguous situations, such as KH, as hostile or aggressive might influence their reactions to KH (Connelly and Zweig, 2015). Another area of debate is how individuals perceive KH. Anaza and Nowlin (2017) suggested that salespeople might not view KH as antisocial behaviour, but as a common practice in their field. This perspective contrasts with the general view of KH as detrimental behaviour. More research is needed to understand how individuals perceive KH and their subjective interpretations or 'construals'. These construals might include various dimensions, such as the perceived fairness of knowledge-request rejection, the frequency of KH, the perceived costs associated with KH and the availability of alternative sources of knowledge. Table 3 presents questions for future research.

Table 3. Individual antecedents: knowledge gaps and proposed research questions

Knowledge gaps	Proposed research questions
The influences of trait combinations, attitudes towards knowledge, and individual motivations on knowledge hiding (KH)	RQ1. How does the combination of various personality traits influence the propensity for KH? RQ2. How does the interaction of personality traits (such as agreeableness and territoriality) influence KH behaviour? RQ3. What role does motivation, specifically in individuals with high Machiavellianism and performance-proven goal orientation, play in KH behaviour?
Perceptions of knowledge hiding (KH)	RQ4. How do individuals perceive and interpret KH events? RQ5. How does the perception of KH vary across different professional fields, and how does this influence KH behaviour? RQ6. How do personal values and traits, such as openness and competitiveness, influence an individual's perception of KH?

Appendix 1, A2: interpersonal factors

Uncivil treatment, bullying (e.g., Anand *et al.*, 2023; Venz and Mohr, 2023), negative gossip (e.g., Khan, A. *et al.*, 2022; Cheng *et al.*, 2023), and ostracism (Bhatti *et al.*, 2023) have been linked to increased KH behaviours. Distrust and a lack of interpersonal trust are also key triggers for KH (e.g., Hadjielias *et al.*, 2021; Jafari-Sadeghi *et al.*, 2022). Workplace conflicts, both task-related and relational, can provoke KH as retaliation or a defence mechanism (e.g., Boz Semerci, 2019; Donate *et al.*, 2022; De Clercq *et al.*, 2022a). Positive dynamics in LMX, co-worker support and social communication are influential in diminishing KH (e.g., Babič *et al.*, 2019; He *et al.*, 2022; Batistič and Poell, 2022).

While much research has delved into the correlation between negative workplace behaviours and KH, less attention has been given to how positive interpersonal dynamics might alleviate such behaviours. For example, the role of workplace friendships in mitigating KH has been relatively unexplored. Studies could investigate whether strong interpersonal connections and friendships at work discourage employees from hiding knowledge from each other, as the influence of peer recognition on KH could be an intriguing area for future research. Employees who feel appreciated and recognised by their peers might be less likely to engage in KH. Researchers could examine whether the frequency and quality of peer recognition affect KH tendencies. Current research primarily focuses on the presence or absence of interpersonal trust and justice. Moreover, the role of interpersonal helping in this context is significant. Acts of assistance and support among colleagues could foster an environment where KH is less prevalent. These aspects and the nuances of interpersonal trust and justice, as detailed in Table 4, offer a broad canvas for future research.

Table 4. Interpersonal antecedents: knowledge gaps and proposed research questions

Knowledge gaps	Proposed research questions
Positive interpersonal dynamics	RQ1. How do positive interpersonal dynamics influence KH behaviours in the workplace?
Peer recognition	RQ2. How does peer recognition affect employees' tendencies to engage in KH?
Interpersonal helping	RQ3. How can interpersonal helping within teams mitigate the tendency to engage in KH?
Interpersonal trust	RQ4. How do varying degrees of interpersonal trust influence KH behaviours in an organisation?

Table 5. Team-level antecedents: knowledge gaps and proposed research questions

Knowledge gaps	Proposed research questions
Contextual aspects	RQ1. How do various team dynamics, such as team culture, project deadlines, team size, and team faultiness or diversity, influence the propensity for KH in teams?
Team faultiness	RQ2. What impact do internal team faultlines, particularly those resulting from cultural or linguistic differences and distinct professional experiences, have on KH?
The interplay between individual and team-level antecedents	RQ3. How do individual characteristics interact with broader team dynamics and collectively influence KH?

Appendix 1, A3: team-level factors

The number of works examining team-level antecedents of KH is relatively scarce. Complex projects increase KH (Zhang, Z. *et al.*, 2022), while effective coordination reduces it (Zhang and Min, 2022b). Leadership style (Lin *et al.*, 2020), team faultlines (Ma *et al.*, 2022) and power dynamics (Hays *et al.*, 2022) significantly impact KH behaviours within teams. However, many contextual aspects and team dynamics still need to be explored, such as team culture, identification, project deadlines, team size and team diversity. For example, building upon the study by Ma *et al.* (2022) on team faultiness, the researchers can study cultural or linguistic differences that could contribute to social faultlines, while distinct professional experiences or skill sets may lead to complex informational faultlines, influencing KH differently. The interaction of these faultlines and their combined effects on KH within teams may also be examined. Beyond the mere presence of faultlines, investigating the strength and specific configuration of these faultlines could also offer deeper insights. Furthermore, the interplay between individual and team-level antecedents in fostering or mitigating KH within teams is an uncharted study area. For instance, exploring how individual traits like openness to experience or assertiveness interact with team dynamics like team identification or faultiness could yield nuanced insights into KH behaviours. Table 5 asks several questions to guide future research.

Appendix 1, A: organisational-level factors

Looking at organisational-level factors, it becomes evident that leadership, job design and the organisational context as antecedents have been the focus of much of the existing research on KH. Negative leadership behaviours, such as abusive (e.g., Wang *et al.*, 2021; Hao *et al.*, 2022), unethical (Almeida *et al.*, 2022; Qin *et al.*, 2023), and exploitative styles (Feng *et al.*, 2022; Moin *et al.*, 2024), are linked to increased KH. In contrast, positive leadership styles like ethical (e.g., Anser *et al.*, 2021; Agarwal *et al.*, 2022b), empowering (Lin *et al.*, 2020), and transformational leadership (Scuotto *et al.*, 2022) tend to reduce KH. Observing supervisors engaging in KH can also encourage similar behaviours among employees (e.g., Offergelt *et al.*, 2019; Arain *et al.*, 2022a). Work-related pressures, including time pressure (Škerlavaj *et al.*, 2018; Zhang, X. *et al.*, 2022) and job insecurity (e.g., Chhabra and Pandey, 2023; Shoss *et al.*, 2023), are significant factors contributing to KH. Job autonomy often decreases KH (Gagné *et al.*, 2019; Peng *et al.*, 2022), while task interdependence shows varied impacts (Gagné *et al.*, 2019; Jafari-Sadeghi *et al.*, 2022). Paradoxically, both work alienation (Guo, L. *et al.*, 2022) and high job engagement (Wang *et al.*, 2019) are associated with increased KH. Organisational politics (e.g., Arain *et al.*, 2022b; De Clercq *et al.*, 2022b), hypocrisy (Zhao and Liu, 2022), and dehumanisation (Muhammad and Sarwar, 2021) are identified as contributors to KH. However, individuals with high political skills are less impacted (Modem *et al.*, 2023). Effective human resource (HR) practices and a culture of trust can mitigate KH (e.g., Haar *et al.*, 2022; El-Kassar *et al.*, 2022), though the effectiveness of HR practices varies depending on the workplace environment (Oubrich *et al.*, 2021). Reward systems also influence KH; often, financial rewards increase KH (Stenius *et al.*, 2016; Zhang and Min, 2021). Internal competition

Table 6. Organisational antecedents: knowledge gaps and proposed research questions

Knowledge gaps	Proposed research questions
Leadership orientation and intensity	RQ1. How do varying intensities and orientations of different leadership behaviours impact KH?
Organisational culture	RQ2. In what ways do specific cultural elements like risk-taking and openness to change affect KH tendencies?
Organisational structure	RQ3. What is the impact of various organisational structures on the propensity for KH?
Organisational change	RQ4. How does organisational change, such as mergers and acquisitions, influence KH behaviours among employees?

generally increases KH (Caputo *et al.*, 2021; Sofyan *et al.*, 2023b), while a positive knowledge culture (Serenko and Bontis, 2016; Chatterjee *et al.*, 2021) and supportive environments (e.g., Tan *et al.*, 2022) can reduce it. However, organisational support's impact on KH can differ, based on cultural contexts (Alnaimi and Rjoub, 2021).

Organisational antecedents of KH, while well-studied, present opportunities for more in-depth exploration, particularly in understanding the complex dynamics of leadership styles and their influences on KH. The traditional binary view of leadership as either positive or negative oversimplifies its diverse range of styles, intensities and orientations, each with unique implications for KH. Delving into these nuances can provide more precise guidance for leaders in managing KH. In addition, the role of specific elements of organisational culture in KH, such as risk-taking, openness to change and collaboration, warrants further investigation. Similarly, how various organisational structures impact KH – flat vs. hierarchical, centralised vs. decentralised, formalised vs. informal – is an area that needs more research. These elements may significantly influence knowledge flow, accessibility and perceptions around hiding knowledge. Another critical research avenue is understanding how organisational transformation – through mergers, acquisitions, restructurings or strategic shifts – affects KH. Such changes might either exacerbate or mitigate KH, depending on the ensuing uncertainty and insecurity or the creation of new knowledge-sharing norms (see Table 6).

Path B: consequences of KH

Appendix 2, B1: individual-level consequences

At the individual level, KH negatively affects in-role performance (e.g., Singh, 2019; Garg *et al.*, 2021; Akhtar *et al.*, 2022), organisational citizenship behaviour (Burmeister *et al.*, 2019; Kaur and Kang, 2023), employee identification (Abdelmotaleb *et al.*, 2022), creativity (e.g., Černe *et al.*, 2017; Zhu *et al.*, 2019; Feng *et al.*, 2022), and hampers innovation (e.g., Chen *et al.*, 2022; Donate *et al.*, 2022). However, certain forms of KH, such as playing dumb, may have mixed effects on short-term innovation performance (Khoreva and Wechtler, 2020). KH also correlates with increased turnover intentions, highlighting its potential influence on employee retention (Zhang and Min, 2022a; Sheidaee *et al.*, 2022). Additionally, KH generally undermines employee well-being and satisfaction (Jiang *et al.*, 2019; Agarwal *et al.*, 2022b), although its specific forms, such as evasive hiding and playing dumb, can vary in their impact on job satisfaction and empowerment (Offergelt *et al.*, 2019).

While the connection between KH and turnover intentions is relatively well-researched, other significant employment outcomes still need to be adequately studied. Future research could delve into the implications of KH on such outcomes as career progression, role transitions and commitment. The long-term effects of KH on an individual's career path and professional development also present a promising avenue for exploration. Second, research regarding the attitudinal and emotional consequences of KH could be more extensive. KH's behaviour might trigger various responses, ranging from resistance to change to lowered job satisfaction and self-efficacy. Potential questions are asked in Table 7.

Table 7. Individual consequences: knowledge gaps and proposed research questions

Knowledge gaps	Proposed research questions
Career path and professional development	RQ1. What are the implications of KH on employment outcomes such as career progression, role transitions and job commitment? RQ2. Can KH lead to stagnation in career progression or hinder role transitions within an organisation?
Attitudinal consequences	RQ3. What are the attitudinal consequences of KH, and how do they affect an individual's professional life?
Emotional consequences	RQ4. What emotional responses can KH trigger in individuals, and how do these responses influence their job performance and satisfaction?

Table 8. Interpersonal consequences: knowledge gaps and proposed research questions

Knowledge gaps	Proposed research questions
Interpersonal trust	RQ1. How does the practice of different types of KH (e.g., evasive hiding, playing dumb, rationalised hiding) impact interpersonal trust, and do they affect willingness to collaborate on future projects?
Status	RQ2. How does the perception of a coworker engaging in KH (e.g., playing dumb) influence their perceived competence and credibility?
Working relationship	RQ3. How does this perception affect the working relationship?

Appendix 2, B2: interpersonal consequences

We encountered only one study from the selected papers that examined the impact of KH on interpersonal relationships. Connelly and Zweig (2015) suggest that not all forms of KH are equally damaging to interpersonal relationships: evasive hiding and playing dumb negatively affect relationships, with the former encouraging future knowledge withholding. More extensive research is needed to understand the impact of different types of KH on various aspects of interpersonal relationships. For example, different types of KH might impact trust, cooperation or even the propensity to engage in other counterproductive work behaviours. Accordingly, we propose the following potential research questions in Table 8.

Appendix 2, B3: team-level consequences

At the team level, KH notably undermines creativity (Bogilović *et al.*, 2017; Fong *et al.*, 2018; Peng *et al.*, 2019), innovation (Zhang and Min, 2022b), project performance (Zhang and Min, 2019; Chatterjee *et al.*, 2021; Zhang, Z. *et al.*, 2022), team stability (Ma *et al.*, 2022) and viability (Wang *et al.*, 2018). When a leader hides knowledge, it harms team citizenship (Arain *et al.*, 2022a). This understanding, while comprehensive, points to gaps in current research, particularly in exploring the impact of KH on team performance. While current literature primarily focuses on project performance, future research could broaden this scope to include in- and extra-role behaviours. In-role behaviours could involve task-specific performances, whereas extra-role behaviours may capture helping behaviours, which can be influenced by KH dynamics within the team. Secondly, there is a need to delve deeper into how KH influences team stability and viability, particularly in dynamic or uncertain environments. For example, the impact of KH in remote teams or teams in crises needs to be studied more (see Table 9).

Table 9. Team-level consequences: knowledge gaps and proposed research questions

Knowledge gaps	Proposed research questions
Team-level in- and extra-role behaviours	RQ1. How does KH impact team performance, specifically concerning in- and extra-role behaviours?
Team stability and viability	RQ2. How does KH influence team stability and viability, especially in dynamic environments or remote teams?

Table 10. Organisational consequences: knowledge gaps and proposed research questions

Knowledge gaps	Proposed research questions
Objective firm performance	RQ1. What is the impact of KH on objective performance metrics like firm value, profitability, market share and return on investment?
Organisational culture, employee retention and organisational learning	RQ2. How does KH affect key organisational outcomes such as organisational culture, employee retention and organisational learning?
Differences across sectors, firm sizes	RQ3. Does the effect of KH on organisational outcomes differ across sectors and firm sizes?

Appendix 2, B4: organisational-level consequences

Fewer studies examine the organizational-level consequences of KH, such as firm performance (Chatterjee *et al.*, 2021; Xiong *et al.*, 2021; Haar *et al.*, 2022) and innovation (Haar *et al.*, 2022; Duan *et al.*, 2022). However, the studies on firm performance focus on perceptual measures rather than objective performance metrics. More investigation is needed of the effect of KH on objective performance metrics such as firm value, profitability, market share and return on investment. Future research might explore the relationship between KH and other crucial organisational outcomes, such as organisational culture, employee retention and organisational learning. Exploring how KH impacts these organisational outcomes across different sectors and firm sizes could provide critical insights (see Table 10).

Path C: boundary conditions of KH

Appendix 3, C1: boundary conditions influencing KH

Individual factors, such as personality traits, skills, values, beliefs and motivation, significantly influence KH. Narcissistic rivalry (De Clercq *et al.*, 2022a), self-esteem (Agarwal *et al.*, 2022a), benevolence (Jahanzeb *et al.*, 2021), and neuroticism (Arshad and Ismail, 2018) influence KH in response to negative workplace behaviours. Similarly, emotional and psychological states, such as self-efficacy (Han *et al.*, 2022) and harmony enhancement (De Clercq *et al.*, 2022b), significantly impact KH. Furthermore, negative reciprocity beliefs (Jahanzeb *et al.*, 2019; Moin *et al.*, 2024) and moral disengagement (Ayub *et al.*, 2021) under abusive leadership heighten KH tendencies. High political skills mitigate the effects of negative leadership on KH (Offergelt and Venz, 2023; Kaur and Kang, 2023), but proactivity can increase KH in competitive settings (Sofyan *et al.*, 2023b). Prosocial motivation decreases KH in low trust (Hernaus and Černe, 2022) and high time-pressure environments (Škerlavaj *et al.*, 2018). At the interpersonal level, such factors as co-rumination (Agarwal *et al.*, 2022a) increase the impact of abusive supervision on KH, but positive affectivity reduces it (Kmieciak, 2022). Strong leader–member relationships can increase KH in response to exploitative leadership (Feng *et al.*, 2022), while weaker relationships amplify the effect of a supervisor's bottom-line mentality on promoting KH (Chen *et al.*, 2022).

In team settings, task interdependence mitigates the impact of self-serving leadership on KH (Peng *et al.*, 2019), while team-based rewards reduce KH's adverse effects on team viability (Wang *et al.*, 2018). Power dynamics (Hays *et al.*, 2022) and team efficacy, especially in trust contexts (Yuan *et al.*, 2021), significantly influence KH. Perceived over-qualification and varying abusive supervision alter KH in teams (Wu *et al.*, 2023). Team climate plays a crucial role: high compliance HR systems promote KH (Batišić and Poell, 2022), but mastery climates reduce it (Men *et al.*, 2020). Social exchanges, collective motivation (Babič *et al.*, 2019), and organisational justice (Huo *et al.*, 2016) also moderate KH, alongside affect-based trust (Guo, M. *et al.*, 2022) and team affective tone (Ma and Zhang, 2022). Team collectivism and relational conflict shape how faultlines and gossip relate to KH (Khan *et al.*, 2021).

Organisational factors, such as procedural justice (Wang *et al.*, 2022) and organisational politics (Arain *et al.*, 2022a), affect KH, while competitive climates under work overload intensify KH (Sofyan *et al.*, 2023a). Forgiving climates (Yao *et al.*, 2020a) and organisational justice (Khan, A. *et al.*, 2022) mitigate the negative impacts of gossip and bullying on KH. The influence of abusive supervision on KH varies with workplace climate (Feng and Wang, 2019). Low organisational psychological ownership weakens the KH-territoriality link (Peng, 2013), and environmental dynamism lessens the adverse effects of KH on customer interactions (Chaker *et al.*, 2021). Evasive KH correlates with pushover managers (Chaker *et al.*, 2021), and various leadership styles, including transformational, ethical and benevolent, affect KH in response to work incivility and job insecurity (Nguyen *et al.*, 2022; Anand *et al.*, 2023; Chhabra and Pandey, 2023). The absence of leader rewards affects the job autonomy–KH relationship (Peng *et al.*, 2022). Job complexity (Qin *et al.*, 2023), task interdependence (Hernaus *et al.*, 2019; Zhang and Min, 2021), job engagement (Ma *et al.*, 2020), and competitive goal interdependence (Zhang and Ji, 2023) influence KH. Job mobility (Guo, L. *et al.*, 2022) and feedback methods (Zhu *et al.*, 2019) also shape KH and its consequences.

The boundary conditions influencing KH have been a focal point of numerous studies. Nevertheless, there remain avenues for exploration that can further enrich this area of research. At the individual level, in challenging or adverse work environments, factors such as individual adaptability and resilience, emotional intelligence, and trait self-esteem can play crucial roles in influencing KH behaviours. These elements, acting as potential moderators, may buffer against or exacerbate the propensity to hide knowledge in response to such stressors as job insecurity or workplace conflict. At the team level, the quality of LMX and the level of relational social capital within teams can significantly affect the tendency for KH among team members. Similarly, at the organisational level, examining how leadership styles such as transactional and inclusive leadership moderate KH could yield novel insights. Additionally, it is particularly interesting to examine whether leadership style (e.g., transformational or transactional) alters how employees perceive and

Table 11. Boundary conditions influencing KH: knowledge gaps and proposed research questions

Knowledge gaps	Proposed research questions
Individual boundary conditions	RQ1. How do individual adaptability and resilience influence KH behaviours in response to workplace stressors like job insecurity or conflicts? RQ2. In what ways do emotional intelligence and trait self-esteem moderate the relationship between interpersonal conflicts and KH?
Team-level boundary conditions	RQ3. How do LMX quality and relational social capital within teams affect the propensity for KH among team members?
Organisational boundary conditions	RQ4. How do organisational policies and practices moderate the impact of leadership behaviours on KH? RQ5. How do different leadership styles interact with job characteristics to impact KH? How does the influence of leadership styles on KH differ across various industries or organisational contexts? RQ6. In what ways do different job design factors moderate the relationship between work pressure and KH?

respond to KH initiated by their supervisors. Furthermore, the role of leadership in KH could be influenced by various factors, such as job characteristics and organisational culture. The effects of such moderating variables remain less studied. Moving from leadership research to job design, we encounter a more complex debate. Some studies associate high work pressure with increased KH as a resource conservation strategy, and others suggest that the fear of negative consequences discourages KH despite work overload. Future research may consider potential moderating variables that might influence this relationship, such as task complexity and performance pressure (see Table 11).

Appendix 3, C2: boundary conditions influencing the consequences of KH

At the individual level, agreeableness influences KH's effect on organisational identification (Abdelmotaleb *et al.*, 2022), the chief executive officer's trust in the chief technology officer effects KH's impact on product development (Xiong *et al.*, 2021), and cultural intelligence modulates KH's effect on creativity (Bogilović *et al.*, 2017). Organisational cynicism (Jiang *et al.*, 2019) and Zhongyong thinking (Chen *et al.*, 2022) also affect KH's impact on psychological safety and innovation. Interpersonally, employee social status intensifies KH's negative effect on creativity (Rhee and Choi, 2017). In teams, task interdependence (Fong *et al.*, 2018), team stability (Zhang and Min, 2019), and climate (Černe *et al.*, 2014, 2017) influence KH's effect on team outcomes. Organizationally, internal knowledge flow moderates KH's relationship with innovation quality (Duan *et al.*, 2022), and leader–follower value congruence affects the consequences of leader KH on various outcomes (Akhtar *et al.*, 2022).

However, the current body of research on boundary conditions influencing KH outcomes remains limited; there is a clear need for more studies, especially those focusing on intervention strategies. First, at the individual level, career stage and cognitive style influence individual responses to KH. Early-career employees, for instance, might be more susceptible to the alienating effects of KH, highlighting the need for targeted support and development opportunities for these individuals. How individuals process information and solve problems could also affect their response to KH. Those with adaptive cognitive styles may find alternative knowledge sources or navigate KH barriers. At the team level, the diversity of expertise and communication norms influences how KH affects team dynamics and outcomes. Teams with a broad range of expertise and open communication channels may experience less disruption from KH, suggesting that team composition and interaction norms are crucial areas for organisational focus and intervention. Finally, such factors as learning orientation play a crucial role at the organisational level. Organisations prioritising learning and development may counter KH's adverse outcomes by fostering environments conducive to alternative knowledge sources and growth. This observation points to the potential effectiveness of organisational policies and practices in shaping the consequences of KH (see Table 12).

Table 12. Boundary conditions influencing the consequences of KH: knowledge gaps and proposed research questions

Knowledge gaps	Proposed research questions
Individual boundary conditions	RQ1. How does an individual's career stage influence their perception and response to KH, particularly among early-career employees? RQ2. How do different cognitive styles, particularly adaptive problem-solving approaches, affect an individual's ability to navigate KH and identify alternative knowledge sources?
Team-level boundary conditions	RQ3. How does the diversity of expertise within a team impact the team's resilience to the disruptive effects of KH?
Organisational boundary conditions	RQ4. What organisational policies and practices can be developed to create an environment that offsets the negative consequences of KH?

Conceptual framework

To understand the academic discourse surrounding KH, the reviewed papers have been organised by theme. Based on this thematic categorisation, we have identified several areas where our understanding is (still) underdeveloped. Building on this understanding and employing inductive logic, a multi-level framework of KH was constructed (Figure 3). This framework incorporates elements that were missing in earlier research and structures existing research within a multi-level framework. A multi-level perspective is crucial for advancing theoretical concepts as it divides them into multiple component elements and then draws relationships between them at different levels of analysis (Salvato and Rerup, 2011). While there are different interpersonal-, team-, and organisational-level sources that individuals can independently draw on to engage KH, it is the congruence between personal attributes and environmental factors that impacts the KH (Babič *et al.*, 2019; Banagou *et al.*, 2021; Arain *et al.*, 2022b). This framework highlights the joined influences of personal and environmental factors on KH and thus increases our understanding of how these factors interact within a dynamic system.

Following this logic, we developed a framework that categorises antecedents, boundary conditions and outcomes of KH across micro, meso, and macro levels, ensuring a holistic view of the phenomenon. The dashed lines in Figure 3 represent areas that have scarcely been studied or not studied, with equal or fewer than five existing works dedicated to these topics.

In this framework, KH operates on multiple interconnected levels: micro (individual and interpersonal), meso (group and team), and macro (organisational and national). At the macro level, we focus on organisational factors (such as internal environment and processes) alongside external factors (such as national culture and country-level economic conditions). These elements are pivotal in shaping KH dynamics, influencing how knowledge is concealed or shared in diverse organisational, cultural and national contexts. We also analyse how KH manifests in different macro-level settings, exploring its impact on innovation and economic performance at the national level. The meso level focuses on the dynamics within groups and teams, highlighting how their characteristics and norms serve as catalysts or deterrents for KH, thus shaping knowledge flow. At the micro level, our focus shifts to individual traits, attitudes and interpersonal interactions that drive KH and its subsequent effects.

In exploring KH, we anticipate intricate, cross-level interactions among micro, meso, and macro factors. For example, at the micro level, individual perceptions and interpretations are critical in shaping responses to KH events. When an individual perceives a KH event as unfair or as a

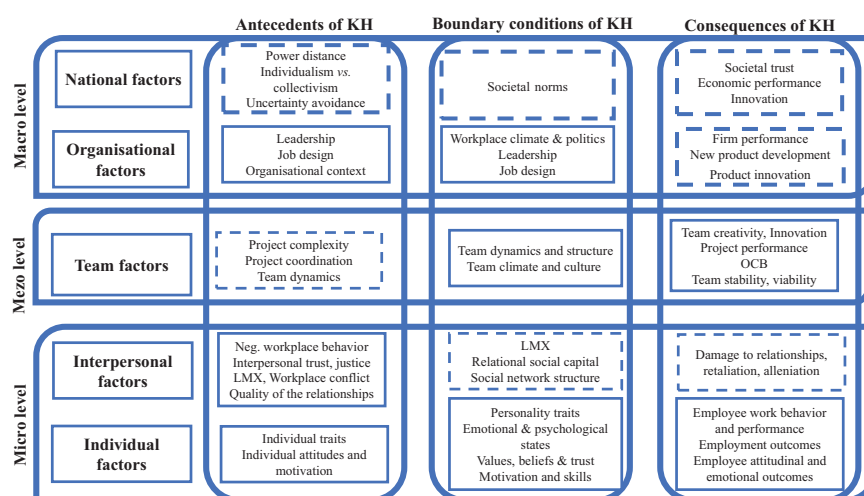


Figure 3. Multi-level Framework of KH

recurrent issue, this can lead to further instances of KH and influence meso-level dynamics, including team cohesion and collective efficacy, which over time can escalate to impact macro-level organisational outcomes such as innovation capability and organisational culture. Simultaneously, group dynamics at the meso level play a pivotal role in mediating the relationship between individual behaviours and organisational outcomes. Such factors as group norms, cohesion and the psychological safety perceived within teams can either mitigate or exacerbate the tendency towards KH. At the macro level, organisational structures, policies and cultures set the stage for managing knowledge. These factors can either promote transparency and sharing or foster an environment conducive to KH, responding rationally to organisational demands and expectations. Such external factors as industry norms and national culture further influence organisational approaches to knowledge management, thereby shaping individual and group behaviours. This suggests that a micro-level investigation is incomplete without incorporating macro- and meso- level interventions.

Conclusion

In systematically reviewing 173 peer-reviewed papers, this research has mapped the key antecedents, boundary conditions and outcomes of research on KH, identified critical knowledge gaps and posed pertinent research questions. The outcomes of our work have led to the development of a multi-level framework that categorises KH at micro, meso and macro levels and integrates the findings from our thematic mapping. This framework consolidates current knowledge in the field of KH and lays the groundwork for future investigations.

The systematic literature review's findings advance our understanding of KH in general and the complex dynamics of KH in particular. The consolidated view of the existing KH literature developed and presented in this paper offers not only a structured approach for future research, but, we also hope, reduces the reinvention of existing knowledge and instead builds upon it to further the understanding and management of KH in various organisational contexts. The proposed dynamic framework highlights the importance of being aware of these multi-level interactions. Interventions at one level will inevitably have ripple effects across others, influencing overall knowledge dynamics within organisations.

It is important to acknowledge some weaknesses. Despite the rigorous approach, relevant papers may still have been omitted. For instance, papers published in journals rated as 1 star or unranked (according to the Association of Business Schools' *Academic Journal Quality Guide*, 2021) were not included. Finally, while systematic reviews are a valuable research method, they have inherent limitations. Future research could perform meta-analyses to offer stronger statistical support of our findings and address one limitation.

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Appendices

Appendix 1. Antecedents of KH

Level	Main findings
A1. Individual	
Individual traits (A1.1), individual attitudes and motivation (A1.2)	<p><i>A1.1</i> Traits such as dark triad traits (Pan <i>et al.</i>, 2018; Soral <i>et al.</i>, 2022), supervisor's bottom-line mentality (Chen <i>et al.</i>, 2023), neuroticism (Anaza and Nowlin, 2017) and cynicism (Nguyen <i>et al.</i>, 2022) promote KH. Traits such as conscientiousness and agreeableness do not significantly correlate with KH (Anaza and Nowlin, 2017; Banagou <i>et al.</i>, 2021). Competitiveness and goal orientation (Hernaus and Černe, 2022; Zhu <i>et al.</i>, 2019; Rhee and Choi, 2017), lack of confidence in the possessed knowledge (Kumar and Varkkey, 2018), psychological entitlement and unmet recognition (Khalid <i>et al.</i>, 2020; Alnaimi and Rjoub, 2021) may drive individuals towards KH. Educated, experienced and emotionally intelligent individuals tend to use rationalised KH as a strategic approach (Zhang <i>et al.</i>, 2023). The tendency of KH is more prevalent at the beginning and end of one's career, indicating the impact of career trajectory on KH behaviour (Issac <i>et al.</i>, 2020).</p> <p><i>A1.2</i> Employees who perceive knowledge as personal property tend to engage more in KH (Pereira and Mohiya, 2021). This ownership, which fosters territoriality, is associated with counterproductive knowledge behaviours, including KH (Shirahada and Zhang, 2022; Huo <i>et al.</i>, 2016; Peng, 2013; Guo, M. <i>et al.</i>, 2022; Jafari-Sadeghi <i>et al.</i>, 2022; Singh, 2019). Motivational factors are also pivotal in KH dynamics. Garg <i>et al.</i> (2021) found a correlation between performance motivation, territoriality, and KH. Xiong <i>et al.</i> (2021) argued KH can provide personal satisfaction and time-saving benefits. Studies by Butt (2021) and Butt and Ahmad (2019) highlight that career-driven motives like indispensability and fear of negative evaluation drive KH. Additionally, Hilliard <i>et al.</i> (2022) observed that certain professionals, like senior staff or R&D engineers, may potentially resort to KH to benefit their organisations.</p>
A2. Interpersonal	
Negative workplace behaviour (A2.1), trust and justice (A2.2), conflict (A2.3), relationship quality (A2.4)	<p><i>A2.1</i> Employees may hide knowledge when treated in an uncivil manner or bullied (Anand <i>et al.</i>, 2023; Venz and Mohr, 2023; Bari <i>et al.</i>, 2023; Chaker <i>et al.</i>, 2021; Yao <i>et al.</i>, 2020b; Arshad and Ismail, 2018). Negative workplace gossip (Cheng <i>et al.</i>, 2023; Khan, A. <i>et al.</i>, 2021, 2022; Yao <i>et al.</i>, 2020a) and workplace ostracism (Bhatti <i>et al.</i>, 2023) can also trigger KH behaviour.</p> <p><i>A2.2</i> Distrust and lack of interpersonal trust can trigger KH behaviour (Jafari-Sadeghi <i>et al.</i>, 2022; Hadjielias <i>et al.</i>, 2021; Issac <i>et al.</i>, 2020; Kumar Jha and Varkkey, 2018; Connelly <i>et al.</i>, 2012). Trustworthy colleagues who treat employees with justice are less likely to face KH (Su, 2021).</p> <p><i>A2.3</i> Task (Donate <i>et al.</i>, 2022; Boz Semerci, 2019) and relational conflicts (Boz Semerci, 2019; Venz and Nesher Shoshan, 2022) may impact employees' tendency to retaliate and lead to KH. KH can also be a defence mechanism resulting from role (De Clercq <i>et al.</i>, 2022a) and relational conflicts (Nguyen <i>et al.</i>, 2022; Peng <i>et al.</i>, 2021).</p> <p><i>A2.4</i> High-quality leader-member exchange (He <i>et al.</i>, 2022; Babič <i>et al.</i>, 2019), co-worker support (Batistič and Poell, 2022) and social communication (Su, 2021) result in less KH. However, Zhao <i>et al.</i> (2019) discovered that leader-member exchange quality is negatively related to evasive hiding and playing dumb but not to rationalised hiding. Stronger personal power boosts knowledge sharing, while expected power losses were linked with increased KH (Issac <i>et al.</i>, 2023). Workplace status can either foster an obligation to share knowledge or induce envy, leading to increased KH (Liu <i>et al.</i>, 2020).</p>
A3. Team	<p>Complex projects, particularly in new product development, tend to increase KH (Zhang, Z. <i>et al.</i>, 2022). In contrast, effective coordination can lead to more knowledge sharing over hiding (Zhang and Min, 2022b). Empowering leadership influences KH through group relational conflicts (Lin <i>et al.</i>, 2020). Team social (e.g., age, gender, race, nationality) faultiness promote KH, but informational (e.g., tasks, information, knowledge) faultiness reduces KH (Ma <i>et al.</i>, 2022), and power dynamics within teams also play a role in KH behaviours (Hays <i>et al.</i>, 2022).</p>

Level	Main findings
A4. Organizational Leadership styles (A4.1), job design (A4.2), organizational context factors (A4.3)	<p><i>A4.1</i> Negative leadership behaviours such as abusive (Hao <i>et al.</i>, 2022; Agarwal <i>et al.</i>, 2022a; Wang <i>et al.</i>, 2021; Pradhan <i>et al.</i>, 2020; Feng and Wang, 2019; Jahanzeb <i>et al.</i>, 2019), unethical (Almeida <i>et al.</i>, 2022; Qin <i>et al.</i>, 2023), punitive (Sarwar <i>et al.</i>, 2021), exploitative (Feng <i>et al.</i>, 2022; Moin <i>et al.</i>, 2024), and self-serving (Peng <i>et al.</i>, 2019) leadership style can lead to KH. Contrarily, employees working under ethical (Agarwal <i>et al.</i>, 2022b; Koay and Lim, 2022; Anser <i>et al.</i>, 2021; Men <i>et al.</i>, 2020), individual-focused empowering (Lin <i>et al.</i>, 2020), transformational (Scuotto <i>et al.</i>, 2022), servant (Usman <i>et al.</i>, 2024), and humble (Al Hawamdeh, 2023) leaders are less likely to hide knowledge from colleagues. Employees who observe their supervisors deliberately hiding knowledge perceive KH as accepted and engage in KH themselves (Arain <i>et al.</i>, 2022a; Offergelt and Venz, 2023; Kmiecik, 2022; Offergelt <i>et al.</i>, 2019).</p> <p><i>A4.2</i> Excessive time pressure (Zhang, X. <i>et al.</i>, 2022; Škerlavaj <i>et al.</i>, 2018) and significant work pressures (Sofyan <i>et al.</i>, 2023a) could promote KH as a resource conservation behaviour. However, fear of reprisal or task delay might deter KH despite work overload (Kmiecik, 2023). Job insecurity can also cause employees to hide knowledge (Chhabra and Pandey, 2023; Kmiecik, 2023; Shoss <i>et al.</i>, 2023; Nguyen <i>et al.</i>, 2022; Serenko and Bontis, 2016). Similarly, overqualification may engender negative emotions, leading to increased KH (Shafique <i>et al.</i>, 2023; Yeşiltaş <i>et al.</i>, 2023; Ma and Zhang, 2022; Li <i>et al.</i>, 2022). High job autonomy reduces KH (Peng <i>et al.</i>, 2022; Gagné <i>et al.</i>, 2019), while task interdependence shows mixed results in its impact on KH (Gagné <i>et al.</i>, 2019; Jafari-Sadeghi <i>et al.</i>, 2022). Paradoxically, both work alienation (Guo, L. <i>et al.</i>, 2022) and high job engagement (Wang <i>et al.</i>, 2019) are associated with increased KH.</p> <p><i>A4.3</i> Organisational politics (Kaur and Kang, 2023; De Clercq <i>et al.</i>, 2022b; Arain <i>et al.</i>, 2022b), corporate hypocrisy (Zhao and Liu, 2022), and organisational dehumanisation (Muhammad and Sarwar, 2021) can contribute to KH. However, individuals with high political skills are less impacted (Modem <i>et al.</i>, 2023). HR practices shape the KH climate, where trust in leadership and effective practices reduce KH (Haar <i>et al.</i>, 2022; El-Kassar <i>et al.</i>, 2022; Good <i>et al.</i>, 2023), but the effectiveness of HRM practices in managing KH varies depending on workplace conditions (Oubrich <i>et al.</i>, 2021). The presence or absence of rewards influences KH, with financial rewards increasing it and non-financial rewards decreasing it (Zhang and Min, 2021; Stenius <i>et al.</i>, 2016; Shrivastava <i>et al.</i>, 2021). A positive knowledge culture affects KH negatively (Chatterjee <i>et al.</i>, 2021; Serenko and Bontis, 2016), but its effectiveness against specific types of KH varies (Connelly <i>et al.</i>, 2012). Feedback for knowledge-sharing prevents withholding (Anaza and Nowlin, 2017), while the knowledge-sharing climate does not significantly impact counterproductive knowledge behaviour (Shirahada and Zhang, 2022). Although Jafari-Sadeghi <i>et al.</i> (2022) discover that a competitive work environment may not significantly contribute to KH in specific contexts, internal competition typically raises KH (Shirahada and Zhang, 2022; Sofyan <i>et al.</i>, 2023b; Caputo <i>et al.</i>, 2021; Chaker <i>et al.</i>, 2021; Butt, 2021; Butt and Ahmad, 2019; Kumar and Varkkey, 2018; Anaza and Nowlin, 2017). Functional bias (Shrivastava <i>et al.</i>, 2021) and perceived organisational injustice (Jahanzeb <i>et al.</i>, 2021; Abubakar <i>et al.</i>, 2019) can trigger KH. Organisational design can mitigate KH only when organisational justice is properly developed (Oubrich <i>et al.</i>, 2021). Supportive environments can mitigate KH (Pereira and Mohiya, 2021; Tan <i>et al.</i>, 2022), but their impact may vary depending on cultural orientation (Alnaimi and Rjoub, 2021).</p>
A5. Miscellaneous	<p>Technological turbulence and employees' AI and robotics awareness can influence KH (Arias-Pérez and Vélez-Jaramillo, 2022), while high information and communication technology (ICT) use is linked to increased KH due to reduced empathy (Zhang and Ji, 2023). Different social media usage patterns affect KH differently (Ma <i>et al.</i>, 2020). Politeness in requests (Xia <i>et al.</i>, 2022), counter-knowledge (Cegarra-Navarro <i>et al.</i>, 2022), social inclusion (Che <i>et al.</i>, 2022), and the adoption of blockchain technology (Chang <i>et al.</i>, 2020) also play roles in KH behaviours.</p>

Appendix 2. Consequences of KH

Level	Main findings
B1. Individual-level	<i>B1.1</i> KH negatively affects in-role performance (Akhtar <i>et al.</i> , 2022; Syed <i>et al.</i> , 2021; Moin <i>et al.</i> , 2024; Garg <i>et al.</i> , 2021; Chaker <i>et al.</i> , 2021; Singh, 2019), though playing dumb might positively impact job performance (Khoreva and Wechtler, 2020). KH also reduces organisational citizenship behaviour (Kaur and Kang, 2023; Burmeister <i>et al.</i> , 2019), employee identification (Abdelmotalieb <i>et al.</i> , 2022), creativity (Feng <i>et al.</i> , 2022; Akhtar <i>et al.</i> , 2022; Chatterjee <i>et al.</i> , 2021; Syed <i>et al.</i> , 2021; Zhu <i>et al.</i> , 2019; Jahanzeb <i>et al.</i> , 2019; Černe <i>et al.</i> , 2017), and hampers innovation (Chen <i>et al.</i> , 2022; Guo, M. <i>et al.</i> , 2022; Donate <i>et al.</i> , 2022; Arain <i>et al.</i> , 2020b; Černe <i>et al.</i> , 2017). It can lead to workplace deviance and silence (Bari <i>et al.</i> , 2020; Singh, 2019). However, Khoreva and Wechtler (2020) found that evasive KH can enhance short-term innovation performance as knowledge becomes more valuable and relevant to individual employees.
B1.1 Employee work behaviour and performance	
B1.2 Employment outcomes	<i>B1.2</i> KH has been linked to increased turnover intentions (Zhang and Min, 2022a; Sheidaee <i>et al.</i> , 2022; Syed <i>et al.</i> , 2021; Offergelt <i>et al.</i> , 2019) and promotability (De Clercq <i>et al.</i> , 2022b). Studying the dimensions of KH in isolation, Offergelt <i>et al.</i> (2019) did not find a similar pattern for rationalised hiding.
B1.3 Employee attitudinal and emotional outcomes	<i>B1.3</i> KH generally undermines well-being and thriving (Agarwal <i>et al.</i> , 2022b; Jiang <i>et al.</i> , 2019). However, playing dumb can lower end-of-work psychological strain, reducing stress immediately (Venz and Nesher Shoshan, 2022). Evasive hiding and playing dumb are negatively related to job satisfaction and empowerment, while rationalised hiding positively affects empowerment (Offergelt <i>et al.</i> , 2019).
B2. Interpersonal	Rationalized KH does not harm relationships or future knowledge withholding, while evasive hiding and playing dumb negatively affect relationships, with the former encouraging future knowledge withholding (Connelly and Zweig, 2015).
B3. Team-level	KH diminishes team creativity (Peng <i>et al.</i> , 2019; Fong <i>et al.</i> , 2018; Bogilović <i>et al.</i> , 2017), innovation (Zhang and Min, 2022b), project performance (Zhang, Z. <i>et al.</i> , 2022; Chatterjee <i>et al.</i> , 2021; Zhang and Min, 2019), team stability (Ma <i>et al.</i> , 2022) and viability (Wang <i>et al.</i> , 2018). When a leader hides knowledge, it harms team citizenship (Arain <i>et al.</i> , 2020a).
B4. Organization-level	KH can negatively impact firm performance (Haar <i>et al.</i> , 2022; Chatterjee <i>et al.</i> , 2021), but strategic KH might benefit certain contexts (Xiong <i>et al.</i> , 2021). The relationship between KH and innovation varies, with both negative (Haar <i>et al.</i> , 2022) and U-shaped relationship (Duan <i>et al.</i> , 2022) impacts noted in different studies.

Appendix 3. Boundary conditions of KH

Level	C1. Boundary conditions influencing KH	C2. Boundary conditions influencing the consequences of KH
Individual-level	<p><i>C1.1</i> Personality traits such as narcissistic rivalry (De Clercq <i>et al.</i>, 2022a), self-esteem (Agarwal <i>et al.</i>, 2022a), benevolence (Jahanzeb <i>et al.</i>, 2021), neuroticism (Arshad and Ismail, 2018), fear of negative evaluation (Syed <i>et al.</i>, 2021), and competitiveness (Peng <i>et al.</i>, 2021) influence KH in response to negative workplace behaviours, with high entitlement and low self-control exacerbating KH in incivility (Venz and Mohr, 2023).</p> <p><i>C1.2</i> Emotional and psychological states like self-efficacy (Han <i>et al.</i>, 2022), harmony enhancement (De Clercq <i>et al.</i>, 2022b), psychological safety (Lin <i>et al.</i>, 2020), and psychological capital (Muhammad and Sarwar, 2021) affect KH, with ego depletion intensifying KH in overqualified individuals (Yeşiltaş <i>et al.</i>, 2023).</p> <p><i>C1.3</i> Values and beliefs such as negative reciprocity (Jahanzeb <i>et al.</i>, 2019; Moin <i>et al.</i>, 2024), trust (Nadeem <i>et al.</i>, 2021), justice orientation (Usman <i>et al.</i>, 2024), and organisational commitment (Koay and Lim, 2022) self-enhancement and job involvement (Agarwal <i>et al.</i>, 2022b), modify how leadership styles relate to KH. In some works, negative reciprocity beliefs and moral disengagement increase evasive hiding and playing dumb but not rationalised hiding (Ayub <i>et al.</i>, 2021; Zhao <i>et al.</i>, 2016). Perceptions of threat controllability and proximity do not affect job insecurity's relationship with KH (Shoss <i>et al.</i>, 2023). Hostile attribution bias intensifies the effect of psychological entitlement on KH (Khalid <i>et al.</i>, 2020), while collectivistic values reduce and individualistic values increase KH in task conflicts (Boz Semerci, 2019).</p> <p><i>C1.4</i> High political skills mitigate the effects of negative leadership on KH (Offergelt and Venz, 2023; Kaur and Kang, 2023), but proactivity can increase KH in competitive settings (Sofyan <i>et al.</i>, 2023b). Prosocial motivation decreases KH in low trust (Hernaus and Černe, 2022) and high-time-pressure environments (Škerlavaj <i>et al.</i>, 2018). Intrinsic motivation for social activities and harmonious work passion lower KH, especially with ethical leadership (Good <i>et al.</i>, 2023; Anser <i>et al.</i>, 2021) and perceived overqualification (Khan, J. <i>et al.</i>, 2022). A high need for affiliation strengthens the relationship between negative workplace gossip and KH (Cheng <i>et al.</i>, 2023).</p>	<p>Agreeableness can modify the effect of KH on organizational identification (Abdelmotaleb <i>et al.</i>, 2022), the CEO's trust in the chief technology officer (CTO) can alter how KH impacts product development (Xiong <i>et al.</i>, 2021), and cultural intelligence can reduce KH's adverse effect on creativity (Bogilović <i>et al.</i>, 2017). Also, organizational cynicism (Jiang <i>et al.</i>, 2019) and Zhongyong thinking (Chen <i>et al.</i>, 2022) influence KH's effects on psychological safety and innovative behaviour, respectively.</p>
Interpersonal-level	<p>Co-rumination increases the impact of abusive supervision on KH (Agarwal <i>et al.</i>, 2022a), but positive affectivity reduces it (Kmieciak, 2022). Overqualification may lead to more KH (Li <i>et al.</i>, 2022), as can low interpersonal liking towards different coworkers (Shafique <i>et al.</i>, 2023). Strong leader-member relationships can increase KH in response to exploitative leadership (Feng <i>et al.</i>, 2022), while weaker relationships amplify the effect of a supervisor's bottom-line mentality on promoting KH (Chen <i>et al.</i>, 2022). Relative leader-member exchange can also influence certain KH types (Zhao <i>et al.</i>, 2019).</p>	<p>Employee social status strengthens the negative impact of KH on creativity (Rhee and Choi, 2017).</p>

(Continued)

Appendix 3. (Continued)

Level	C1. Boundary conditions influencing KH	C2. Boundary conditions influencing the consequences of KH
Team-level	<p><i>C1.3a.</i> Task interdependence lessens the negative impact of self-serving leadership on KH (Peng <i>et al.</i>, 2019), while team-based rewards reduce KH's adverse effects on team viability (Wang <i>et al.</i>, 2018). Power and status differences within teams influence KH and performance (Hays <i>et al.</i>, 2022), and team efficacy can either reduce or amplify specific types of KH depending on interpersonal trust (Yuan <i>et al.</i>, 2021). Perceived overqualification and differences in abusive supervision also affect KH in teams (Wu <i>et al.</i>, 2023).</p> <p><i>C1.3b.</i> Climate impacts KH more than personality, regardless of cultural context (Banagou <i>et al.</i>, 2021). High compliance HR systems and market pricing environments increase KH (Batisitič and Poell, 2022), while a mastery climate diminishes the impact of ethical leadership on KH (Men <i>et al.</i>, 2020). Social leader-member exchanges and collective prosocial motivation are key factors (Babič <i>et al.</i>, 2019), and organisational justice moderates territoriality's influence on KH (Huo <i>et al.</i>, 2016). Affect-based trust affects the relationship between territorial feelings and KH, impacting innovation (Guo, M. <i>et al.</i>, 2022), and high trust can lessen the negative effects of project complexity on performance (Zhang, Z. <i>et al.</i>, 2022). A positive team affective tone mitigates the link between negative emotions and KH (Ma and Zhang, 2022), and team collectivism and relational conflict influence the relation between faultlines, gossip and KH (Khan <i>et al.</i>, 2021).</p>	<p>Task interdependence (Fong <i>et al.</i>, 2018), team stability (Zhang and Min, 2019), and climate (Černe <i>et al.</i>, 2014, 2017) can influence KH's impact on team learning, project performance, and creativity, respectively. The negative relationship between KH and creativity in a high-performance climate becomes more pronounced (Černe <i>et al.</i>, 2014).</p>
Organisational-level	<p><i>C1.4a</i> Procedural justice (Wang <i>et al.</i>, 2022) and organisational politics (Arain <i>et al.</i>, 2022a) significantly influence KH, with competitive climates exacerbating KH under work overload (Sofyan <i>et al.</i>, 2023a). Forgiving climates (Yao <i>et al.</i>, 2020a) and organisational justice (Khan <i>et al.</i>, 2022) can reduce the adverse effects of gossip and bullying on KH, respectively. The impact of abusive supervision on KH varies with different workplace climates (Feng and Wang, 2019), and lower psychological ownership within the organisation weakens the link between KH and territoriality (Peng, 2013). Environmental dynamism reduces the negative effects of evasive KH on customer interactions (Chaker <i>et al.</i>, 2021).</p> <p><i>C1.4b</i> Evasive KH is linked with pushover managers (Chaker <i>et al.</i>, 2021), while transformational, ethical and benevolent leadership styles moderate KH in the face of work incivility and job insecurity (Anand <i>et al.</i>, 2023; Chhabra and Pandey, 2023; Nguyen <i>et al.</i>, 2022). The absence of leader rewards influences the relationship between job autonomy and KH (Peng <i>et al.</i>, 2022).</p> <p><i>C1.4c</i> Job complexity can lessen the impact of unethical leadership on KH (Qin <i>et al.</i>, 2023), and task interdependence influences the relationship between rewards and KH (Zhang and Min, 2021; Hernaes <i>et al.</i>, 2019). High job engagement moderates the impact of social media use on KH (Ma <i>et al.</i>, 2020), while competitive goal interdependence strengthens the negative effects of ICT use on empathy and KH (Zhang and Ji, 2023). Job mobility (Guo, L. <i>et al.</i>, 2022) and feedback methods (Zhu <i>et al.</i>, 2019) are also crucial in shaping KH and its outcomes.</p>	<p>Internal knowledge flow can moderate the relationship between KH and innovation quality (Duan <i>et al.</i>, 2022), and leader-follower value congruence can intensify the effects of leader KH on feedback avoidance, creativity and job performance (Akhtar <i>et al.</i>, 2022).</p>

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