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The role of nature of knowledge and knowledge creating processes in knowledge hiding: Reframing knowledge hiding

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ABSTRACT

Knowledge hiding research has traditionally focused on the ways in which knowledge is hidden in the context of interactions between employees. This study advances knowledge hiding research by highlighting the benefits of moving away from the dyadic level of analysis to a multilevel analysis across individuals, groups, and organizations. We also elaborate how knowledge hiding is influenced both by the nature of knowledge and by the modes of knowledge creation in organizations. We propose a theoretical framework that juxtaposes the nature of knowledge – tacit vs. explicit and component vs. architectural – against the four modes – socialization, externalization, combination, and internalization – of the knowledge creating process in organizations. The framework developed in our study also enables us to identify four distinct root causes of knowledge hiding in organizations – functional bias, misaligned incentives, dysfunctional resource allocations, and value incongruence.

1. Introduction

Knowledge sharing, defined as a conscious attempt by an employee to make knowledge available to others in their organization (Ipe, 2003), is said to drive organizational performance and engender innovation and creativity (Černe, Nerstad, Dysvik, & Škerlavaj, 2014; Hadjimichael & Tsoukas, 2019; Nonaka, 1994). Conversely, knowledge hiding, defined as "an intentional attempt by an individual to withhold or conceal knowledge that has been requested by another person" (Connelly, Zweig, Webster, & Trougakos, 2012, p. 65), has been linked to lower levels of trust, innovation, creativity, and individual performance (Černe, Nerstad, Dysvik, & Škerlavaj, 2014; Connelly et al., 2012; Connelly, Černe, Dysvik, & Škerlavaj, 2019). Despite organizations being avowedly committed to encouraging collaboration and knowledge sharing among employees (Hislop, 2002; Serenko & Bontis, 2016), knowledge hiding continues to be prevalent and have significant implications for organizations. About a decade and a half ago, Fortune 500 companies were estimated to be losing at least $31.5bn to knowledge hiding annually (Babcock, 2004 as cited by Peng, 2013). In addition to financial implications, knowledge hiding has been found to engender feelings of guilt (Burmeister, Gerpott, & Fasbender, 2019) and damage interpersonal relationships in organizations (Connelly et al., 2012; Connelly & Zweig, 2015), making this phenomenon both theoretically interesting and practically relevant.

Despite growing scholarly interest in the antecedents and manifestations of knowledge hiding in organizations (e.g., Chatterjee, Chaudhuri, Thrassou, & Vrontis, 2021; Connelly et al. 2012; Singh, 2019; Xiong, Chang, Scuotto, Shi, & Paoloni, 2021; Yao, Luo & Zhang, 2020), scholars have noted that further research is needed that moves beyond the current focus on knowledge hiding occurring in the context of dyadic interactions between a 'knowledge seeker' and a 'knowledge hider'. In particular, recent calls have been made to focus on the context in which knowledge requests arise (Connelly et al., 2019) and the nature of knowledge requested (Gagné et al. 2019), both of which can influence knowledge hiding behaviors. For example, organizations are likely to treat knowledge requests emanating during a product development stage differently from those emanating during a product recall. Similarly, an R&D manager who readily shares the technical properties of an alloy may be reluctant to share accident-related information.

In this paper, we respond to the above calls by drawing on knowledge management, strategy, and organizational learning literatures to develop a theoretical framework that focuses on the nature of knowledge that gets hidden during the knowledge creating processes in organizations. We argue that the nature of knowledge that gets hidden in

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organizations can be captured by two dimensions: Knowledge State (*tacit* or *explicit*) and Knowledge Form (whether the knowledge exists in a *component* form pertaining to a specific function or in an *architectural form* pertaining to the larger system). We then develop a theoretical framework that juxtaposes the nature of the knowledge that gets hidden against Nonaka's (1994) SECI model that illustrates the four modes of knowledge creation in organizations – socialization, externalization, combination, and internalization.

By reframing knowledge hiding in the above manner, we make three contributions to the literature. First, we broaden the concept of knowledge hiding by revising its boundary conditions to move beyond the current emphasis on the dyadic interaction between a knowledge seeker and a knowledge hider (e.g., Connelly et al., 2012; Connelly & Zweig, 2015; Xiong et al., 2021) and draw attention to the role of the nature of knowledge and of the context in which knowledge requests occur. Second, we develop a theoretical framework that identifies four distinct reasons why knowledge gets hidden during the knowledge creation process in organizations – *functional bias*, *misaligned incentives*, *dysfunctional resource allocation*, and *value incongruence*. We argue that these can be seen as the root causes of knowledge hiding in each of the different modes of knowledge creation. In turn, each of these root causes underpins a group of antecedents that have been identified by prior studies and which can be seen as proximate causes of knowledge hiding in organizations. Finally, our focus on *what* knowledge gets hidden (as opposed to *how* it gets hidden) offers new insights on *why* knowledge gets hidden, thereby allowing organizations to eschew a one size fits all approach and counter knowledge hiding by designing interventions that are contingent on the specific root cause of knowledge hiding they face.

2. Revisiting the boundary conditions of knowledge hiding

In their seminal paper, Connelly et al. (2012) identify three knowledge hiding dimensions: *evasive hiding,* the tendency to provide partial or misleading information and make false promises about one's intent to share information in the future; *rationalised hiding,* the tendency to justify why the knowledge requested cannot be provided; and *playing dumb*, the tendency to feign ignorance. Research on the antecedents of knowledge hiding behaviors, however, has generally tended to collapse these three dimensions and treat knowledge hiding as a unidimensional construct. This is especially true of the research that focuses on individual level antecedents. For example, employees with high levels of proving goal orientation (that is, those employees who wish to achieve higher performance than others) are more likely to indulge in knowledge hiding behaviors of all types (Rhee & Choi, 2017), as are those with traits associated with the dark triad of personality – Machiavellianism, narcissism, and psychopathy (Pan, Zhang, Teo & Lim, 2018). In contrast, traits such as agreeableness, empathy, helpfulness, and concern for others associated with prosocial motivation are negatively related with knowledge hiding behaviors (Škerlavaj, Connelly, Černe, & Dysvik, 2018). Thus, this research suggests that some individuals may be generally hard-wired to hide knowledge.

Research that has focused on interpersonal- and organizational-level antecedents of knowledge hiding has suggested that, in several contexts, employees may be susceptible to displaying some form of knowledge hiding behaviors, independent of their individual inclinations. For example, the nature of organizational climate in which social exchanges take place (Anaza & Nowlin, 2017; Connelly et al., 2012; Černe et al., 2014), perceived organizational politics (Malik, et al. 2019), organizational cynicism and psychological safety (Jiang, Hu, Wang, & Jiang, 2019), job insecurity and lack of confidence (Jha and Varkkey, 2018), norms around collaboration (Xiong et al., 2021), interpersonal work conflict (Venz & Shoshan, in press), the signals sent by leaders to their subordinates (Arain, Bhatti, Ashraf, & Fang, 2020; Offergelt et al., 2019), the quality of leader-member exchanges (Zhao, Liu, Li & Yu, 2019), and whether the performance feedback focuses on group or individual performance (Zhu, Chen, Wang, Jin, & Wang, 2019) have all been linked to knowledge hiding behaviors (also see Connelly et al., 2019).

Research has also explored the role of territoriality in the context of knowledge hiding (Peng, 2013; Singh, 2019). The notion of territoriality captures the tendency of employees to be possessive about the knowledge that they are called upon to share. If territoriality is high employees can be expected to hide their knowledge, especially if the request to share it emanates from those with whom they have had prior negative interactions. To the extent that territoriality is a consequence of workplace practices that engender individualism at the expense of organizational ownership, it could be counteracted by designing jobs and tasks which foster collaboration among employees through task interdependence. However, while task interdependence could mitigate the negative effects of knowledge hiding on team performance (Fong, Men, Luo, & Jia, 2018; Singh, 2019), it could also unwittingly foster knowledge hiding in the presence of external regulation that monitors employees and tries to enforce collaboration (Gagné et al., 2019). To add further complexity to the findings in the area, Ford, Myrden, and Jones (2015) have found that employees may refrain from knowledge sharing because of the costs associated with communicating with others. Similarly, knowledge hiding may be a response to stressors such as interpersonal conflict (Venz & Shoshan, in press).

Taken together, our review of the literature reveals that the antecedents of knowledge hiding range across macro-, meso- and micro-levels of analysis and interact with one another across levels. It also suggests that researchers attempting to better understand why knowledge hiding occurs would need to account for the fact that the same individuals in different contexts, and, indeed, on different days, may display different knowledge hiding behaviors (also see Venz & Shoshan, in press). Therefore, opportunities for elaborations exist on two fronts. Firstly, evidence on the multilevel antecedents of knowledge hiding needs to be accounted for by an integrative framework that establishes linkages between antecedents at different levels of analysis (i.e., individual, interpersonal, organizational etc.). This has been recently pointed out by Xiong and colleagues (2021, p. 800) who noted that "no study has employed a comprehensive theoretical framework to examine the (factors that lead to) knowledge hiding." Secondly, given that the antecedents implicated are from across levels, including societal and cultural levels, opportunities exist to revisit the boundary conditions of knowledge hiding that is currently conceptualised as a dyadic level construct.

The seminal article by Connelly and colleagues (2012) did "examine knowledge hiding as a reaction to…the characteristics of the knowledge itself" (p.33). However, since then scholars have paid scant attention to the characteristics of the knowledge that tends to get hidden as they seem to have mostly focused on *how* knowledge gets hidden (i.e., on whether employees evade, rationalise, or play dumb). Apart from the seminal article and a recent article by Chatterjee et al. (2021), both of which posit that the complexity of the knowledge being requested can trigger knowledge hiding given the effort and time involved in sharing complex knowledge, few other scholarly works have focused on the characteristics of the knowledge that gets hidden. A notable exception is a study by Hernaus, Cerne, Connelly, Vokic and Škerlavaj (2019) that found academics tend to hide tacit knowledge more than they do explicit knowledge as the former is easier to hide. The integrative framework we put forth in this study will explore the role that the nature of knowledge requested plays in the context of knowledge hiding. However, before presenting our integrative framework, we revisit the boundary conditions of the knowledge hiding construct. We argue that doing so will enable us to not only account for the existing empirical evidence on the various antecedents of knowledge hiding, but also to capture the influence that factors existing outside of the dyadic interaction between knowledge seeker and knowledge hider play in influencing knowledge hiding in organizations.

The seminal definition of the knowledge hiding construct (Connelly et al, 2012) emphasizes two aspects: (i) that there must be an intent to

hide knowledge, and (ii) that knowledge hiding always occurs in response to a request from an individual. In other words, it is a phenomenon that appears to be typically confined to dyadic interactions. The empirical evidence on the antecedents of knowledge hiding discussed above, however, suggests that it would be beneficial to broaden the boundaries of the construct to better account for the influence of meso and macro factors that can pay a role in its occurrence. We argue that the effects of knowledge being hoarded, hidden, or not shared, whether deliberately or otherwise, is the same to the entity that needs the knowledge independent of the intent of who possesses the knowledge. Consider for instance an employee who is unable to find the time to respond to a knowledge request; this person has no intention to hide knowledge (Ford, Myrden, & Jones, 2015). Similarly, a person who chooses to withhold knowledge in response to an interpersonal conflict (Venz & Shoshan, in press) may not have the principal intention to hide knowledge. Arguably, their intention would likely be to exact revenge through whatever opportunity they can get. Nonetheless, their actions would be tantamount to knowledge hiding. Further, knowledge hiding could be seen as being akin to bullying (Connelly et al. 2012) and the literature explains that the intent of the perpetrator of bullying is not considered important; instead, it is the perception of the target being bullied that is the key consideration (Einarsen, Hoel, Zapf & Cooper 2020).

The above discussion of the antecedents of knowledge hiding suggests that in certain contexts (e.g., in competitive or politicised organizations) knowledge gets hidden not only at the dyadic level but also among and between teams and organizational sub-units (Xiong et al., 2021). Consider the example of a disgruntled employee who smells a gas leak in their office building and chooses not to do anything about it because they want to harm their organization. Their inaction leads to an explosion and physical harm. Note that, as per the extant definition, the failure on the part of the employee to act will not be considered a case of knowledge hiding because (a) the incident did not involve the employee withholding any information that was specifically requested; and (b) the employee's act was directed towards the organization and not toward another individual. We believe that relaxing the current focus on knowledge hiding as a dyadic phenomenon can potentially enhance the applicability of the construct and contribute to both consolidating existing knowledge and catalysing future work.

Imagine if, in the above example, all employees had earlier been sent a letter by an official in the Occupation Health and Safety (OHS) department to report safety hazards, including gas leaks. As per the extant definition, the employee's inaction would then be deemed knowledge hiding because the requirement for a dyadic interaction would have been met. But a cursory reflection reveals that when the official from OHS requested for those hazard-related alerts, it was the organization, not the individual *per se*, who had made the request. Usually, when individuals approach other colleagues for information, they do so on behalf of their work units or organizations. After all, organizations and teams act through their individual members (Nonaka, 1994). Consider another example of an activist from an NGO whose deforestation-related information request gets stonewalled by an official in the Ministry of Environment. The stonewalling may entail a dyadic interaction, but it is a case in which the entire society is harmed due to evasive hiding by its government. There is thus a case to expand the boundary of the knowledge hiding definition to include interactions across levels, including inter-organizational interactions.

We have argued that the employee who withheld knowledge about the gas leak, even in the absence of any request from OHS, could be deemed to have hidden their knowledge. It does not matter whether the entity concerned was specifically requested to share their knowledge. All instances where knowledge is withheld by an entity despite its knowing that sharing such knowledge could avert a crisis or solve a problem constitute examples of knowledge hiding. Thus, an entity's intention comes into play only when knowledge has not been specifically requested, as was the case in the initial gas-leak example. However, an entity does not hide knowledge if it declines to respond to knowledge requests for legitimate reasons. For example, a Coca Cola Company official declining information requests that could compromise the company's trade secret (i.e., its famous formula) is not a case of an entity indulging in *rationalised hiding* as the logic put forth in the seminal paper by Connelly et al. (2012) would have one conclude. Similarly, it would not be an example of *evasive hiding*, if a CEO while responding to a query from a financial reporter about bonuses to individual executives were to release only consolidated information, provided the country or company in question considered pay secrecy norms legal or acceptable.

Withholding information for legitimate business reasons, as in the trade secret or pay secrecy examples, seems fundamentally different from hiding information as described in the gas leak example. As such, instances wherein knowledge is withheld due to legitimate reasons should not be treated as instances of knowledge hiding. To summarise, we have made a case that the knowledge hiding construct should apply only to cases where there are no legitimate reasons to decline a knowledge request. We have also argued that the intention of the entities involved should be ignored if a specific and legitimate knowledge request has been made. Otherwise, even in the absence of a knowledge sharing request (as in the initial gas leak example), an intentional act to withhold potentially useful knowledge should be construed as an act of knowledge hiding. Additionally, and importantly, the discussion stemming from the gas leak example implies that knowledge hiding need not be confined to the dyadic level. Accordingly, we propose the following modified definition of knowledge hiding: *Knowledge hiding occurs when an entity withholds knowledge that has been legitimately requested by another entity or when, in the absence of a knowledge request, it intentionally withholds potentially useful knowledge.* This would facilitate studying micro-, meso- and macro-level influences while excluding instances where the entities involved may have moral, ethical, or legal constraints that prevent them from responding to knowledge requests.

Finally, we note that although a footnote to the seminal definition clarifies that knowledge "…encompasses the information, ideas, and expertise relevant for tasks performed by organizational members…" (Connelly et al., 2012, p. 65), most empirical works on knowledge hiding have tended to operationalise knowledge only as an 'explicit' object specifically requested for by another colleague. However, as the knowledge management and organizational learning literature imply, surfacing and sharing of explicit knowledge is perhaps not as critical to organizations as is surfacing and sharing tacit knowledge (Hadjimichael & Tsoukas, 2019; Leonard & Sensiper, 1998).

3. Understanding the nature of hidden organizational knowledge

In this section, we discuss two typologies of knowledge that are relevant in the context of knowledge hiding. Knowledge can be seen as having two dimensions or existing in two states: (i) tacit – the knowledge that we draw from when in action that is difficult to articulate and consciously access (e.g., when making a sales pitch); and (ii) explicit – the knowledge that can be codified and articulated and accessed consciously (e.g., customer retention data) (Nonaka, 1994; Pereira & Mohiya, 2021; Xiong et al., 2021). Notwithstanding this useful distinction between the two states of knowledge, we concur with the claim that, "while tacit knowledge can be possessed by itself, explicit knowledge must rely on being tacitly understood and applied. Hence all knowledge is either tacit or rooted in tacit knowledge. A wholly explicit knowledge is unthinkable" (Polanyi, 1966a, p.7 as cited by Hadjimichael, & Tsoukas, 2019). Knowledge hiding in the organizational context would mean one of two things: either employees are not sharing the explicit knowledge that they hold within them (e.g., a store manager refusing to divulge inventory control metrics to their peers) or efforts to convert tacit knowledge held by employees into explicit knowledge are not producing the desired results (e.g., experienced scientists are disengaged when mentoring interns or they are withholding their insights

during product development).

Recollect that specific knowledge requests, in the main, pertain to explicit knowledge (Connelly et al., 2012). As mentioned earlier, the extant literature on the antecedents of knowledge hiding recognises that tacit knowledge is complex, and employees need more effort and time to surface it. Hence it is more prone to getting hidden (Chatterjee, et al., 2021; Connelly et al., 2012; Hernaus et al., 2019). Arguably, tacit knowledge that is withheld in the absence of specific requests can be more detrimental to organizations than withheld explicit knowledge for, in the case of the former, an organization may not even realize that it is lacking available knowledge that could dramatically improve outcomes. In this context, Polanyi's (1966b) assertion that we invariably know more than what we can tell is particularly relevant. This also implies that organizations must necessarily rely on their employees to volunteer their tacit expertise as they cannot be forced to do so (see Gagné et al., 2019). It could well be that some organizational climates foster employee creativity (Černe, et al., 2014; Chatterjee et al., 2021) mainly because tacit knowledge tends to be volunteered and applied more readily in such climates.

Another knowledge typology that can be used in conjunction with the tacit and explicit typology is the one developed by Henderson and Clark (1990) to understand the nature of organizational knowledge in a product development context. This typology identified knowledge as being either *component knowledge* or *architectural knowledge*. Matusik and Hill (1998) later argued that this typology could be used to capture organizational knowledge more generally. They explained that component knowledge refers to knowledge about a distinct sub-routine or discrete aspect of a firm's operations, such as the one pertaining to specialist functions held by individuals or teams (e.g., billing or payroll). Component knowledge is relatively transparent and acontextual. It is usually available in the public domain and tends to be primarily explicit, and when it is not, it lends itself to being made explicit relatively easily (Tallman, Jenkins, Henry & Pinch, 2004). Architectural knowledge, in contrast, relates to knowledge about organization-wide operations. It pertains to how various components within an organization are integrated to produce new knowledge. Therefore, architectural knowledge tends to be idiosyncratic and embedded within organizations. It is, in the main, tacit and does not lend itself to be being easily converted into explicit knowledge (Tallman et al., 2004).

It is however important to note that both component and architectural knowledge contain elements of tacit and explicit knowledge to varying degrees. It might be useful to think of knowledge dimensions as being analogous to the different states that water can exist in, with tacit knowledge being like the amorphous water vapor state and explicit knowledge being like solid ice. Just as water can be converted into its different states, so can knowledge. We hold that knowledge hiding occurs during the knowledge conversion processes that firms must continually execute to create knowledge (Nonaka, 1994) in order to sustain their operations and develop new products or services. In the subsequent sections we discuss how examining the nature of knowledge that is hidden in the context of these knowledge creating processes might generate novel insights on the knowledge hiding phenomenon.

4. The role of the nature of knowledge and knowledge creation process

According to the knowledge-based view, firms exist to create, transfer, and apply knowledge (Grant, 1996; Nonaka, 1994; Spender, 1996). Further, firms may be described as repositories of knowledge stocks and flows (Dierickx & Cool, 1989). Knowledge stocks are the sum of skills, wisdom, and expertise possessed by a firm at a point in time. Knowledge flows, instead, refer to streams of new knowledge that are continually obtained either internally or externally, transferred, or integrated to enrich, expand, renew, and modify existing knowledge stocks. Integrating insights from the organizational learning, strategy and human capital literatures, Kang, Morris, and Snell (2007) posit that firms rely on component and architectural knowledge for exploration and exploitation. As the terms suggest, exploration pertains to firms developing and launching new products and services through seeking and applying new knowledge to create new value propositions. Conversely, exploitation is about deepening the existing knowledge stocks to grow revenue streams from existing products and/or services to sustain current operations. While exploitation too involves knowledge creation, the knowledge created pertains to incremental innovation and continuous improvements as opposed to new product launches and disruptive transformation, which is the domain of exploration. Firms thus need to maintain a balance between exploration and exploitation to survive and prosper (March, 1991).

As Kang, Morris, and Snell (2007) explain, common (or shared) architectural knowledge helps employees understand how their respective areas of expertise come together to produce the final whole. The areas of expertise do not necessarily have to interact or overlap with each other, but the experts do need to appreciate that the larger system could place conflicting demands on the various components. Thus, the process of developing common or shared architectural knowledge entails experts focusing on their respective areas while they learn how to create synergies to maximise outputs of the system as a whole. Therefore, common architectural knowledge is said to facilitate exploitation. For exploration, employees need to share component knowledge with one another to enable collaboration. That is, they need to understand relevant aspects of domains of expertise other than their own to collaborate and successfully launch new products or services (e.g., a kitchen appliance developed without any inputs about consumer habits from the marketing department may prove to be a failure). Common component knowledge facilitates exploration because it entails employees absorbing knowledge from a wide range of colleagues (Kang, Morris, & Snell, 2007). After all, creativity, that is central to innovation, has been linked to exposure to a myriad of ideas though social exchanges (Černe, et al., 2014).

In sum, exploration is about enhancing the breadth of organizational knowledge through experts sharing their component knowledge with each other to innovate and generate new knowledge. In contrast, exploitation is about deepening existing organizational knowledge through employees sharing their architectural knowledge with each other as they go about applying their component knowledge in their area of expertise. It is thus vital that the employees be able and willing to share both component and architectural knowledge to create new knowledge in organizations. We posit that organizations with high levels of knowledge hiding would struggle to successfully engage in and strike a balance between exploration and exploitation that is necessary for long-term survival (March, 1991). The argument implies that knowledge hiding during knowledge creating processes can manifest itself in the form of under-exploration, under-exploitation, or both.

We now turn to Nonaka and Takeuchi's (1995) model of knowledge creation to trace how tacit and explicit knowledge get converted into one another via four different modes –Socialization – Externalization – Combination – Internalization – as organizations attempt to create new knowledge by processing component and architectural knowledge. As will become clear, the quality of knowledge created, and hence the quality of the new product or service developed, is largely contingent on the ability and willingness of employees to share their knowledge with each other. Instances of knowledge hiding during knowledge creating processes are analogous to cases of underutilizing and wasting raw materials during manufacturing. We will later argue that the SECI model can help identify why knowledge gets hidden in each of the four modes of knowledge creation.

The SECI model can be understood by deconstructing the process that was undertaken by the Japanese electronics company, Matsushita (now known as Panasonic) to manufacture a home bread-making machine (Nonaka, 2007). In the wake of initial failures, one of Matsushita's software engineers, Tanaka decided to shadow a renowned local baker and observe his dough-kneading technique. In this *Socialization* mode,

aspects of the baker's tacit knowledge got absorbed by Tanaka as part of her tacit knowledge. Next, Tanaka shared her learnings with a group of experts from different functional areas. In this *Externalisation* mode, the baker's tacit knowledge was made explicit for the first time. All the functional experts then tried to apply what they had learned to distil principles that could inform product design. This *Combination* mode entailed individuals from different areas combining their explicit knowledge with those of others to develop a knowledge system. This made the combined explicit knowledge not only more explicit but also multifunctional and residing at a higher level of complexity. In the final *Internalisation* mode, the manufacturing team gained an intuitive understanding of what it meant to manufacture a working model. Their explicit knowledge thus got converted into tacit knowledge, but again it was at higher level of complexity as they experienced how the different components came together to make a bread-making machine.

The cycle of product innovation described above gets repeated every time an organization decides to design and launch a new product or a service (Nonaka, 1994). So, in the organizational context, tacit knowledge gets continually converted into explicit knowledge and vice versa, albeit at different complexity levels. It would thus not be appropriate to capture these explicit-tacit knowledge conversions along a continuum. The conversions reside in what may be visualized as a spiral that involves more and more people as the quality of knowledge gets enhanced through continual cross-pollination of ideas and knowledge sharing (Nonaka, 1994; Nonaka & Takeuchi, 1995). The SECI model suggests that it is imperative for organizations to maintain knowledge flows through the knowledge creating spiral. Knowledge hiding during the process can impede such flows and detract from the quality of knowledge that ultimately gets applied to innovate products and services.

The above discussion suggests that knowledge hiding in organizations could be captured by juxtaposing the SECI model of knowledge creation against a two-by-two matrix with one of the axes depicting the state of knowledge withheld (tacit-explicit) and the other depicting the form of knowledge withheld (component – architectural). The horizontal and vertical axis in the matrix, in this instance, rise along the plane of the three-dimensional knowledge spiral as shown in Fig. 1. The resulting knowledge hiding matrix implies that, in an organizational context, every bit of knowledge is in part tacit and explicit albeit to varying degrees. Issues arise in the knowledge creation process whenever the necessary bit is withheld at any stage in the value creation spiral. For example, the lower left quadrant in the matrix indicates that the Tacit Component bit (T-Comp) is being withheld. The degree of complexity of the tacit-explicit element rises as the spiral rises across the four modes.

To return to the SECI model, the initial impetus for the development of the home baking machine came from the baker and the software engineer willingly sharing their tacit specialist knowledge (i.e., component knowledge) with each other. Had this not occurred the company might have never learned from the intuitive dough kneading technique that the baker had perfected over years of practice. Extrapolating from this example, we argue that T-Comp knowledge would be more likely to be withheld in organizations where employees lack opportunities to 'socialize' or freely exchange their component knowledge with each other. As Kang and Snell (2009) observe, a tendency among specialists to work in their respective silos is more suited for deepening the knowledge base, rather than widening it. The latter is a necessary condition for creativity to flourish. Thus, we identify *functional bias* as a root cause (or a second level antecedent) of T-Comp knowledge hiding. The tendency of functional specialists to work independently can be counteracted by creating opportunities for project-based collaboration and creating a 'growth mindset' (Dweck, 2006). For instance, the current CEO of Microsoft created opportunities for overcoming functional silos by generating opportunities for enhancing functional vision through training seminars, rotating individuals across functions and product lines, and greater focus on collaboration. Otherwise, the consequence of such knowledge hiding would be a dearth of innovative ideas for new products or services.

The top left quadrant depicts elements of Explicit Component (X-Comp) knowledge being withheld. This is the stage where, having absorbed knowledge from the baker, the software engineer had

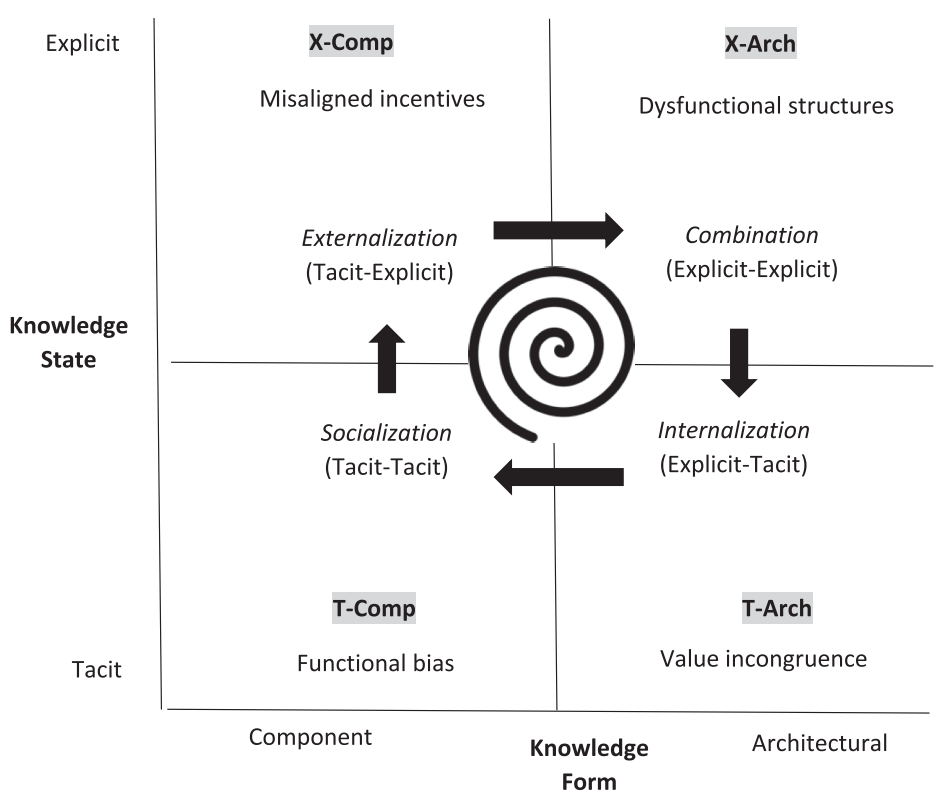

Fig. 1. The Knowledge Hiding Matrix.

externalised it for the benefit of other functional experts in the organization. The functional experts in this stage are expected to build on each other's ideas and articulate how their functional area might alleviate or impose constraints on the emergent product idea (see Jassawalla, & Sashittal, 1999). One can imagine how, for instance, a chemical engineer withholding knowledge about viscosity of liquids could have adversely affected the quality of dough kneading in the bread-making machine example. Component knowledge tends to be primarily explicit and ordinarily specialists can be expected to readily share their expert knowledge. The tendency to hide X-Comp could thus be a case of *misaligned incentives*. This tendency could be counteracted by designing and introducing appropriate incentives that encourage individual to collaborate. As Kang, Morris and Snell (2007) note, "individual incentives may stimulate employees' motives to build varied relationships for exploratory learning (Edmondson, 1999), while discouraging social loafing that is considered an inherent problem in group-based incentives." X-Comp knowledge being withheld would result in sub-optimal new product design.

In a similar manner, the top right quadrant depicts Explicit Architectural (X-Arch) knowledge being withheld. In the SECI model discussed above, this is the stage where all functional areas combine their knowledge to develop a prototype of the bread-making machine. This stage would involve resource allocation decisions and close co-operation from across functions. Delays at this stage are likely to indicate that some executives who have explicit architectural knowledge are withholding it owing to dysfunctional power dynamics. A classic example in this situation is the well-publicized failure of the Daimler-Chrysler merger (Morosini & Radler, 1999), where the perceived synergies that were meant to occur through the sharing of platform technology (i.e., by the Germans) and market insights on accessing distributors and customers (i.e., by the Americans) did not fully occur due to the rivalry between the American and German management teams. Thus, organizational resources that ought to be readily accessible, were not shared. Although the merger was positioned as a 'merger of equals', the absence of a coherent and coordinated organizational entity was evidenced in two separate companies operating within one company. One can posit that such a state of affairs would be attributable to informal *dysfunctional structures*. Delays in decision-making and resource allocation would be the norm in this quadrant.

Finally, the lower right quadrant is the area where generalists and specialists must both work together to start manufacturing and delivering the product or service to the clients. Tacit Architectural (T-Arch) knowledge withheld in this quadrant is likely to be because of *value incongruence*. The phenomenon tends to occur in large organizations that generate a lot of resources through exploitation. As Christensen and Raynor (2013) found, incumbent industry leaders tend to excel at exploitation, but their value systems often prevent them from launching disruptive products and services. The value system in this context refers to the size of the market that the business values. Put differently, large organizations, saddled by their default processes, are unable to mobilize the tacit architectural knowledge at the relatively smaller scale needed to acquire an intuitive understanding of successfully manufacturing and launching the new product in question. Quality control and pricing issues, the latter owing to bloated cost structures, are a likely consequence of withholding knowledge in this quadrant. As can be seen, the knowledge hiding matrix can generate fertile areas of research and bring to the fore higher-level conceptual antecedents of knowledge hiding. The proposed framework also has important implications for practice as it can generate informed prescriptions based on the nature of knowledge that is hidden.

5. Discussion and conclusion

The theoretical framework developed in this study has several implications for theory and practice that hold promise to further advance research on knowledge hiding in organizations. In the broadest sense, our study has hinted at the benefits of shifting the focus from *how* knowledge gets hidden at the dyadic level to *what* knowledge gets hidden and the need to build theory that can explain knowledge hiding behaviors across levels of analysis. While out study has focused on contextual factors related to the nature of the knowledge being hidden (Pereira & Mohiya, 2021; Xiong et al., 2021) and the mode of organizational knowledge creation (Nonaka, 1994), opportunities exist to further flesh out interrelations between different antecedents of knowledge hiding behaviors by individuals, teams, and organizations. For example, while our framework has suggested a role for team dynamics in this context, this would need to be further explored by future studies.

The four root causes of knowledge hiding that emerge through juxtaposing the nature of knowledge that is hidden against the four modes of the knowledge creating process also suggest testable hypotheses pertaining to each of the four quadrants in the knowledge hiding matrix (refer back to Fig. 1). For example, in the context of the lower left quadrant, one could hypothesize that knowledge hiding during *socialization* will be negatively related to the quality and quantum of innovative ideas generated. Similarly, the top left quadrant suggests that experts who feel more secure will be less inclined to hide their knowledge in the *externalization* phase. Researchers may also test the effect of distinct root causes on the specific knowledge hiding behaviors identified by Connelly et al. (2012). For example, one could posit that specialists cannot afford to play dumb and hide X-Comp knowledge. However, they may evade requests for T-Comp knowledge. If such behaviors were more prevalent in organizations with functional silos, it would mean indirect support for the claim that functional bias leads to T-Comp knowledge hiding.

Opportunities also exist for scholars to operationalise the extent of knowledge hiding through social network analysis (see, for example, Martínez-Torres, 2014). To do so, however, they would need to develop measures for the four elements of the nature of knowledge in order to test the basic premise of the knowledge hiding matrix developed in this study, namely that different knowledge tends to get hidden during different modes of knowledge creation. Documented specialist knowledge could be classified as X-Comp knowledge. Similarly, organizational charts, process flow diagrams, and so forth could be classified X-Arch knowledge. Proxy measures such as employees' experience and formal qualifications may need to be factored in while measuring T-Comp and T-Arch knowledge. The more complex elements of T-Arch knowledge may reside within senior executive teams and the more experienced generalists (Kang, Morris, & Snell, 2007). We also note that the four structural antecedents — *functional bias, misaligned incentives, dysfunctional structures, and value incongruence* — that were described as playing a key role in each knowledge hiding mode are posited to be able to conceptually subsume the antecedents identified by knowledge hiding scholars that are proximal to hiding behaviors at the dyadic level (see Table 1).

Conceptually, the first order antecedents can be linked to the more abstract structural antecedents. For instance, distrust and territoriality, could be theorised as stemming from a functional bias which could lead to a dearth of innovative ideas. Similarly, misaligned incentives can prompt specialists to go against their nature and hide T-Comp knowledge. In this context, the nature of LMX (cf. Sonpar, Walsh, Pazzaglia, Eng, & Dastmalchian, 2018), signals by leaders who condone or encourage knowledge hiding, lack of psychological safety, performance feedback encouraging certain types of behaviors could be seen as factors incentivizing the hiding of X-Comp knowledge that could lead to sub-optimal product/service design owing to the lack of requisite expert inputs. We believe that qualitative studies that take into account perspectives of leaders and/or bystanders might be particularly relevant and timely to unravel such behaviors. With respect to X-Arch knowledge hiding, dysfunctional structures can account for lack of interdependent structures. Further, since dysfunctional structures can influence resource allocation, reporting lines, and dyadic relationships, such

Table 1
Knowledge Hiding – Causes, Consequences and Prevention.

Organizational phenomenon	Nature of Knowledge Hidden				Remarks
	T-Comp	*X-Comp*	*X-Arch*	*T-Arch*	
Proximate Cause (First level antecedents)	Distrust (+ve); territoriality (+ve);	Psychological safety (- ve); job insecurity (+ve), performance feedback (+ve/-ve); LMX and leadership signals (+ve/-ve).	Org climate (+ve/-ve); task interdependence (-ve)	Yet to be generated*	Extant evidence (direction of relationship in parentheses) * Antecedents of Tacit architectural knowledge hiding are yet to receive scholarly attention.
Root Cause (Second level antecedent)	Functional bias	Misaligned incentives	Dysfunctional structures	Value incongruence	Conceptual domain.
Consequence	Dearth of innovative ideas	Sub-optimal product or service design	Delays in decision making	Quality and pricing issues	
Preventive measures	Multiskilling	Individualized incentives for specialists	Leadership change and restructuring	Autonomy	

structures can account for a large part of the organizational climate in general. As shown in Table 1, a key consequence of dysfunctional structures tends to be poor decision making as political considerations overwhelm other considerations (Buchanan & Badham, 2020).

The first order antecedents that have been accounted for by the second order antecedents do not include personality related antecedents (e.g., under confidence, prosocial, proving goal orientation, and the dark triad). This is because conceptually, personality traits would play a role in all four modes. Nonetheless, second order antecedents could be expected to mitigate personality traits (see Schneider, Smith, Taylor, & Fleenor, 1998). Notice also, that Table 1 does not contain any first order antecedent of T-Arch knowledge. This is because knowledge hiding scholars have thus far exclusively focused on tacit knowledge transfer within dyads. The evidence from the innovation literature on how incumbent industry leaders get disrupted by new entrants (Christensen & Raynor, 2013) does suggest that value incongruence between the existing exploitation-oriented operations and the one demanded by the new exploratory technology can prevent industry leaders from acquiring the T-Arch knowledge needed to disrupt their own operations. The disruption literature suggests granting autonomy to the sub-unit in question to address the value incongruence problem.

As shown in Table 1, the proposed reframing generates prescriptions for practice as well. These prescriptions flow from the conceptual link between the first and second order antecedents, the knowledge hiding phenomenon and its consequence. At the broadest level, our theoretical framework suggests that organizations would benefit from making interventions that are contingent on the knowledge hidden and when it is hidden (i.e., during which of the four SECI modes). For example, multiskilling would mean ensuring that specialists get exposure to interfaces between their own speciality and those of others, thus mitigating their functional bias to an extent during socialization. At times it can be difficult to tease apart consequences and antecedents. For instance, distrust can engender knowledge hiding but it can also be a consequence of knowledge hiding owing to reciprocal loops (Singh, 2019). The second order antecedents can help organizations address this chicken-and-egg dilemma by identifying the root cause of the knowledge hiding they face. Addressing functional bias may offer a more durable solution to distrust among specialists. The line-of-sight between the preventive measures and the relevant root cause (i.e., the second order antecedent) applicable in the other modes of knowledge creation is shown in Table 1.

Our paper also has several implications for practice. First, managers need to understand how both the nature of knowledge and knowledge creation processes can influence what knowledge gets hidden within organizations and why. Thus, they would need to use targeted initiatives to minimize knowledge hiding based on contextual factors in addition to focusing on the influence of personality of individuals in engendering such behaviors. Second, and in addition to the role played by personality and/or intention, managers should be alert to how their organizations might inadvertently tolerate or enable knowledge hiding through functional silos, misaligned incentives, dysfunctional structures, and incongruence in values. Admittedly, this may require a shift towards focusing on the influence of organizational culture and leadership frames in catalyzing certain behaviors within organizations. Third, and given the importance of collaboration and a need for inter-functional alignment, managers would be well advised to be alert to internal rivalries and coalitions within organizations. For example, Sherif et al.'s (1961) seminal study on intergroup conflict through the Robber's Cave experiments revealed that the inevitability of intergroup hostility due to competition for power, resources and control could only be overcome through superordinate goals that promote collaboration and shared success. Finally, our framework would help them identify the consequences of knowledge hiding (e.g., delays in decision-making) and often serve as a starting point to both understand why this is happening and to introduce some preventive measures to address their root cause.

In conclusion, our reframing of the knowledge hiding phenomena was premised on a focus on what constitutes knowledge. Instead of focusing on how knowledge is hidden, we focused on the nature of knowledge that gets hidden. This change in focus drew attention to the state in which knowledge exists (tacit-explicit) and the form in which it is used (component-architect). In the proposed reframing, the knowledge that gets hidden during the knowledge creating process became the phenomenon of central interest and it, in turn, predicted specific antecedents and consequences. We have argued that the knowledge creating context could bring to the fore structural reasons that could explain why knowledge gets hidden by organizations, teams, and individuals. The emergence of structural antecedents that could be applied across levels of analysis was consistent with the expanded boundary condition of the knowledge hiding construct from the dyadic level to groups and organizational levels. The proposed framework promises to open new avenues of research for knowledge hiding scholars. It also suggests a way of parsimoniously accounting for the empirical evidence on the antecedents of knowledge hiding. The knowledge hiding matrix helps diagnose why knowledge gets withheld, thus suggesting theory-driven prescriptions to counter the knowledge-hiding phenomenon. We hope that future studies would further explore the boundaries of the knowledge hiding construct and focus more on the nature of knowledge to make advances in the area.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

Anaza, N. A., & Nowlin, E. L. (2017). What's mine is mine: A study of salesperson knowledge withholding and hoarding behaviour. *Industrial Marketing Management, 64*, 14–24.

Arain, G. A., Bhatti, Z. A., Ashraf, N., & Fang, Y.-H. (2020). Top-down knowledge hiding in organizations: An empirical study of the consequences of supervisor knowledge hiding among local and foreign workers in the Middle East. *Journal of Business Ethics, 164*(3), 611–625.

Babcock, P. (2004). Shedding light on knowledge management. *HR Magazine, 49*(5), 46–50.

Buchanan, D., & Badham, R. (2020). *Power, politics, and organizational change*. Sage.

Burmeister, A., Gerpott, F. H., & Fasbender, U. (2019). Consequences of knowledge hiding: The differential compensatory effects of guilt and shame. *Journal of Occupational and Organizational Psychology, 92*(2), 281–304.

Černe, M., Nerstad, C. G. L., Dysvik, A., & Škerlavaj, M. (2014). What goes around comes around: Knowledge hiding, perceived motivational climate, and creativity. *Academy of Management Journal, 57*(1), 172–192.

Chatterjee, S., Chaudhuri, R., Thrassou, A., & Vrontis, D. (2021). Antecedents and consequences of knowledge hiding: The moderating role of knowledge hiders and knowledge seekers in organizations. *Journal of Business Research, 128*, 303–313.

Christensen, C., & Raynor, M. (2013). *The innovator's solution: Creating and sustaining successful growth*. Cambridge, MA: HBS Press.

Connelly, C. E., & Zweig, D. (2015). How perpetrators and targets construe knowledge hiding in organizations. *European Journal of Work and Organizational Psychology, 24*(3), 479–489.

Connelly, C. E., Černe, M., Dysvik, A., & Škerlavaj, M. (2019). Understanding knowledge hiding in organizations. *Journal of Organizational Behavior, 40*(7), 779–782.

Connelly, C. E., Zweig, D., Webster, J., & Trougakos, J. P. (2012). Knowledge hiding in organizations. *Journal of Organizational Behavior, 33*(1), 64–88.

Dierickx, I., & Cool, K. (1989). Asset stock accumulation and sustainability of competitive advantage. *Management Science, 35*(12), 1504–1511.

Dweck, C. (2006). *Mindset: The new psychology of success*. NY: Random House.

Edmondson, A. (1999). Psychological safety and learning behavior in network teams. *Administrative Science Quarterly, 44*, 350–383.

Einarsen, S. V., Hoel, H., Zapf, D., & Cooper, C. L. (2020). The concept of bullying and harassment at work: The European tradition. In S. V. Einarsen, H. Hoel, D. Zapf, & C. L. Cooper (Eds.), *Bullying and Harassment in the Workplace: Theory, Research and Practice* (3rd ed, pp. 3–53). London: CRC Press.

Fong, P. S. W., Men, C., Luo, J., & Jia, R. (2018). Knowledge hiding and team creativity: The contingent role of task interdependence. *Management Decision, 56*(2), 329–343.

Ford, D., Myrden, S. E., & Jones, T. D. (2015). Understanding "disengagement from knowledge sharing": Engagement theory versus adaptive cost theory. *Journal of Knowledge Management, 19*(3), 476–496.

Gagné, M., Tian, A. W., Soo, C., Zhang, B.o., Ho, K. S. B., & Hosszu, K. (2019). Different motivations for knowledge sharing and hiding: The role of motivating work design. *Journal of Organizational Behavior, 40*(7), 783–799.

Grant, R. M. (1996). Toward a knowledge-based theory of the firm. *Strategic Management Journal, 17*(S2), 109–122.

Hadjimichael, D., & Tsoukas, H. (2019). Toward a better understanding of tacit knowledge in organizations: Taking stock and moving forward. *Academy of Management Annals, 13*(2), 672–703.

Henderson, R. M., & Clark, K. B. (1990). Architectural innovation: The reconfiguration of existing product technologies and the failure of established firms. *Administrative Science Quarterly, 35*(1), 9. https://doi.org/10.2307/2393549.

Hernaus, T., Cerne, M., Connelly, C., Vokic, N. P., & Škerlavaj, M. (2019). Evasive knowledge hiding in academia: When competitive individuals are asked to collaborate. *Journal of Knowledge Management, 23*(4), 597–618.

Hislop, D. (2002). Mission impossible? Communicating and sharing knowledge via information technology. *Journal of Information Technology, 17*(3), 165–177.

Ipe, M. (2003). Knowledge sharing in organizations: A conceptual framework. *HRM Development Review, 2*(4), 337–359.

Jassawalla, A. R., & Sashittal, H. C. (1999). Building collaborative cross-functional new product teams. *Academy of Management Perspectives, 13*(3), 50–63.

Jha, J. K., & Varkkey, B. (2018). Are you a cistern or a channel? Exploring factors triggering knowledge-hiding behavior at the workplace: Evidence from the Indian R&D professionals. *Journal of Knowledge Management, 22*(4), 824–849.

Jiang, Z., Hu, X., Wang, Z., & Jiang, X. (2019). Knowledge hiding as a barrier to thriving: The mediating role of psychological safety and moderating role of organizational cynicism. *Journal of Organizational Behavior, 40*(7), 800–818.

Kang, S. C., & Snell, S. A. (2009). Intellectual capital architectures and ambidextrous learning: A framework for human resource management. *Journal of Management Studies, 46*(1), 65–92.

Kang, S.-C., Morris, S. S., & Snell, S. A. (2007). Relational archetypes, organizational learning, and value creation: Extending the human resource architecture. *Academy of Management Review, 32*(1), 236–256.

Leonard, D., & Sensiper, S. (1998). The role of tacit knowledge in group innovation. *California Management Review, 40*(3), 112–132.

Malik, O. F., Shahzad, A., Raziq, M. M., Khan, M. M., Yusaf, S., & Khan, A. (2019). Perceptions of organizational politics, knowledge hiding, and employee creativity: The moderating role of professional commitment. *Personality and Individual Differences, 142*, 232–237.

March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science, 2*(1), 71–87.

Martínez-Torres, M. R. (2014). Analysis of open innovation communities from the perspective of social network analysis. *Technology Analysis & Strategic Management, 26*(4), 435–451.

Matusik, S. F., & Hill, C. W. L. (1998). The utilization of contingent work, knowledge creation, and competitive advantage. *Academy of Management Review, 23*(4), 680–697.

Morosini, P., & Radler, G. (1999). *Daimler-Chrysler: The post-merger integration phase*. IMD.

Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization Science, 5*(1), 14–37.

Nonaka, I. (2007). The Knowledge-creating Company. *Harvard Business Review, 85*(Jul-Aug), 162–171 (original article published: 1991).

Nonaka, I., & Takeuchi, H. (1995). *The Knowledge-creating Company: How Japanese companies create the Dynamics of Innovation*. Oxford University Press.

Offergelt, F., Spörrle, M., Moser, K., & Shaw, J. D. (2019). Leader-signaled knowledge hiding: Effects on employees' job attitudes and empowerment. *Journal of Organizational Behavior, 40*(7), 819–833.

Pan, W., Zhang, Q., Teo, T. S. H., & Lim, V. K. G. (2018). The dark triad and knowledge hiding. *International Journal of Information Management, 42*, 36–48.

Peng, H.e. (2013). Why and when do people hide knowledge? *Journal of Knowledge Management, 17*(3), 398–415.

Pereira, V., & Mohiya, M. (2021). Share or hide? Investigating positive and negative employee intentions and organizational support in the context of knowledge sharing and hiding. *Journal of Business Research, 129*, 368–381.

Polanyi, M. (1966a). The logic of tacit inference. Philosophy: *The Journal of the Royal Institute of. Philosophy, 41*(155), 1–18.

Polanyi, M. (1966b). *The Tacit Dimension*. Chicago: University of Chicago Press.

Rhee, Y. W., & Choi, J. N. (2017). Knowledge management behavior and individual creativity: Goal orientations as antecedents and in-group social status as moderating contingency. *Journal of Organizational Behavior, 38*(6), 813–832.

Schneider, B., Smith, D. B., Taylor, S., & Fleenor, J. (1998). Personality and organizations: A test of the homogeneity of personality hypothesis. *Journal of Applied Psychology, 83*(3), 462–470.

Serenko, A., & Bontis, N. (2016). Understanding counterproductive knowledge behavior: Antecedents and consequences of intra-organizational knowledge hiding. *Journal of knowledge management., 20*(6), 1199–1224.

Sherif, M., Harvey, O. J., White, B. J., Hood, W. R., & Sherif, C. W. (1961). *Intergroup conflict and cooperation: The Robbers Cave experiment*. Norman: University of Oklahoma Book Exchange.

Singh, S. K. (2019). Territoriality, task performance, and workplace deviance: Empirical evidence on role of knowledge hiding. *Journal of Business Research, 97*, 10–19.

Škerlavaj, M., Connelly, C. E., Cerne, M., & Dysvik, A. (2018). Tell me if you can: Time pressure, prosocial motivation, perspective taking, and knowledge hiding. *Journal of Knowledge Management, 22*(7), 1489–1509.

Sonpar, K., Walsh, I., Pazzaglia, F., Eng, M., & Dastmalchian, A. (2018). Picking the measuring stick: The role of leaders in social comparisons. *Journal of Management Studies, 55*(4), 677–702.

Spender, J.-C. (1996). Making knowledge the basis of a dynamic theory of the firm. *Strategic Management Journal, Winter Special Issue, 17*, 45–62.

Tallman, S., Jenkins, M., Henry, N., & Pinch, S. (2004). Knowledge, clusters, and competitive advantage. *Academy of Management Review, 29*(2), 258–271.

Venz, L., & Shoshan, H. N. (2021). Be Smart, Play Dumb? A Transactional Perspective on Day-Specific Knowledge Hiding, Interpersonal Conflict, and Psychological Strain. *Human Relations*. https://doi.org/10.1177/0018726721990438 (in press).

Xiong, C., Chang, V., Scuotto, V., Shi, Y., & Paoloni, N. (2021). The social-psychological approach in understanding knowledge hiding within international R&D teams: An inductive analysis. *Journal of Business Research, 128*, 799–811.

Yao, Z., Luo, J., & Zhang, X. (2020). Gossip is a fearful thing: the impact of negative workplace gossip on knowledge hiding. *Journal of Knowledge Management, 24*(7), 1755–1777.

Zhao, H., Liu, W., Li, J., & Yu, X. (2019). Leader–member exchange, organizational identification, and knowledge hiding: The moderating role of relative leader–member exchange. *Journal of Organizational Behavior, 40*(7), 834–848.

Zhu, Y., Chen, T., Wang, M.o., Jin, Y., & Wang, Y. (2019). Rivals or allies: How performance-prove goal orientation influences knowledge hiding. *Journal of Organizational Behavior, 40*(7), 849–868.