

## **The Social-Psychological Approach in Understanding Knowledge Hiding within International R&D Teams: An Inductive Analysis**

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## **Abstract**

Knowledge hiding is widely considered a counter-productive workplace behavior that can hinder the employees' creativity and have a negative impact on performance. Although companies are prone to encourage knowledge sharing practices, employees are inclined to hide their knowledge – tacit and explicit. Often this happens in research and development (R&D) process where team members may distrust each other or intentionally are not hostile in sharing knowledge. The phenomenon of knowledge hiding has increased the interest in researchers who have explored it in different views, there has been little research into the antecedents of knowledge hiding and the social factors that trigger the relate behavior. In this vein, the current study seeks to analyze antecedents and social factors through the lens of the theory of planned behavior as the guiding theory in an in-depth qualitative research. Specifically, knowledge hiders' attitudes, subjective norms and their perceived behavioral control over the knowledge hiding along with the cultural dimensions of 15 international R&D teams are investigated. Although exploratory, the study reveals the fact that cultivating an environment of collaboration and knowledge sharing is beneficial as it removes the organizational foundation of knowledge hiding, which is more likely to result in increased innovation within the whole organization. A comprehensive theoretical framework of knowledge hiding is proposed, and its implications on theory and practice are discussed with the aim of nudging further explorations on the topic.

## **Keywords:**

Knowledge hiding; Theory of planned behavior; Social influence; International R&D teams; Individualism-collectivism

## 1. Introduction

According to scholars including Kelloway and Barling (2000), companies are prone to stimulate knowledge sharing practices among employees. Knowledge is considered the key of an organizational success with a particular focus to the international R&D teams' activities (Ambos and Schlegelmilch, 2004). Indeed, knowledge enhances creativity as well as efficiency in producing innovative outcomes (Dong et al., 2017). Companies, thus, introduce rewarding programs to increase knowledge sharing, for example, of best practices. Despite that, there is still a reluctance in sharing knowledge between R&D team members (Connelly et al., 2012; see also Swap et al., 2001; Bock et al., 2005). This reluctance is a knowledge hiding practice which is defined as the willingness to conceal information another individual asked for (Connelly et al., 2012). This definition indicates a dyadic relationship between a knowledge seeker and a knowledge hider. A knowledge hider may exhibit any of three different forms of behavior: *playing dumb* (i.e. where knowledge hider pretends not to know the knowledge of interest), *rationalized hiding* (i.e. where the knowledge hider is offering reasons for not providing the requested knowledge) and *evasive hiding* (i.e. where the knowledge hider offers involuntarily incomplete information). The latter behavior emphasizes that knowledge hiding is not always a negative behavior within an organizational context, and it may lead to positive outcomes such as the protection of confidentiality or the interest of the third party (Takala & Urpilainen, 1991; Saxe, 1991). Other research has showed the negative impact of knowledge hiding on employees' creativity and established a link between a lower level of R&D outcomes within organizations (Bogilović, Černe, & Škerlavaj, 2017; Malik et al., 2018).

Knowledge hiding is recognized to be a research area to be more explored. Studies on this phenomenon have explored the dyadic relationship in hiding knowledge within an organization (Connelly et al., 2012), the effect of time pressure on knowledge hiding (Škerlavaj, et al., 2018), the influence of territoriality on knowledge hiding (Singh, 2019), and the tendency to hold unique information among team members (Xiao, Zhang, & Basadur, 2016). This has induced research that different individual personalities can influence working team projects and provoke

conflicts (Tekleab, & Quigley, 2014). However, knowledge can be hidden when people feel a psychological ownership of that knowledge (Peng, 2013) that can generate knowledge hoarding (Webster et al., 2008) and so degenerate in negative organizational behaviors such as counterproductive work behaviors (CWB), aggression, social undermining, incivility, and deception (Pearson & Porath, 2005; Penney & Spector, 2005; Černe et al., 2014).

Some researchers have also explored the psychological factors which lead to a knowledge hiding behavior (Kumar Jha & Varkkey, 2018; Malik et al., 2018; Pan et al., 2018), offering a solid foundation for future inquiries. Overall, knowledge hiding is triggered by both various personal (i.e. personality traits), organizational (i.e. organizational politics and knowledge-sharing climate) and social factors (i.e. reciprocal norms). However, several limitations and research gaps within the extant literature regarding knowledge hiding are identified. First, to the best of our knowledge, no study has employed a comprehensive theoretical framework to examine the knowledge hiding. A comprehensive understanding of the mechanisms of how these factors lead to knowledge hiding intentions is needed. Existing studies have not fully explored the social factors contributing to knowledge hiding. Identifying these factors could enable managers to effectively reduce the knowledge hiding intentions within their organizations. In addition, as the impact of subjective norms tend to vary in different cultural settings (Smith, 2015), the impact of culture on knowledge hiding intentions is under-researched and so need to be further examined. On this basis, we explore antecedents and social factors on the lens of the theory of planned behavior (Ajzen, 1991) as the guiding theory in an in-depth qualitative research. Specifically, knowledge hidiers' attitudes, subjective norms and their perceived behavioral control over the knowledge hiding along with the cultural dimensions of 15 international R&D teams are investigated.

Although it is an exploratory study, the current article, thus, contributes to the knowledge hiding literature by proposing a comprehensive theoretical framework of understanding knowledge hiding within the international R&D context. Furthermore, since it is argued by scholars that

the personal or individual barriers to knowledge sharing behavior is the most difficult to overcome from a management perspective, and this is due to the fact that personal knowledge and the access to it is not controlled by organizations (Geofroy & Evans, 2007), the research also offer valid recommendation to managers as well from a practical perspective.

## **2. Literature review**

A limited number of studies have identified the antecedents of knowledge hiding behaviors. These factors include the perceived interpersonal distrust, the complexity of the requested knowledge, the task-relatedness of the knowledge and the knowledge sharing climate within the team/organization (Connelly et al., 2012). In a later study, time pressure, prosocial motivation and perspective taking were also found to be influential to knowledge hidings (Škerlavaj et al., 2018). In a recent qualitative study into the factors lead to knowledge hidings, competitive work environment, perceived career insecurity, lack of reciprocation and lack of confidence in own knowledge were identified using a sample of 19 R&D professionals from Indian pharmaceutical firms (Kumar Jha & Varkkey, 2018). Examining the impact of knowledge hiding on employee creativity, researchers show a positive relationship between perceived organizational politics and knowledge hiding, moderated by employees' professional commitments (Malik et al., 2018). Knowledge hiding can induce an emotional exhaustion and deviant behavior and so lower productivity (Mulki Jaramillo, & Locander, 2006) which also calls for organizational deviance (Hsieh and Wang, 2016). This is connected to the matter of transactional psychological contracts where short-term, economic values are sought and people are most likely to ignore the knowledge request from coworkers (Pan et al., 2018).

Effective knowledge transfer is of particular importance for R&D teams, as the growth of these teams or organizations is largely dependent on the innovation outcomes of their professionals who relies intensively on various knowledge (Černe et al., 2014). Scholars have studied extensively on the management strategies in encouraging knowledge sharing behaviors such as

providing management support (Cabrera & Cabrera, 2005) and cultivating the culture of knowledge sharing (Serenko & Bontis, 2016). However, considering the fact that not all employees have an initial knowledge sharing intention and knowledge hiding and sharing are intrinsically two different behaviors, a further examination of R&D team members' knowledge hiding intentions is imperative. In addition to this, the impact of culture on knowledge hiding intentions of R&D team members from different countries are unexplored.

Knowledge hiding started to gain scholarly attentions from the 2012 when Connelly et al (2012) coined the term and defined it as the intentional concealing of particular knowledge from a person to another person. In fact, a diverse range of theoretical views are offered. For example, at the individual level, scholars argued that employees with higher emotional intelligence may demonstrate knowledge hiding behaviors less frequently (Geofroy and Evans, 2007). This is supported by the argument that employees or R&D team members with higher emotional intelligence would be more committed to the organizational achievement, teamwork and trust-building with other members within the same team or organisation. These personal characteristics, which are often regarded as a result of higher emotional intelligence, are argued to reduce their intentions in conducting knowledge hiding (Hoegl and Proserpio, 2004).

Another personal level antecedents of knowledge hiding is the bond of an individual who develops it with a piece of specific knowledge, especially when the knowledge is gained at the cost of huge efforts. In other words, a person who has exerted considerable effort to develop (specific?) knowledge, may be less likely to share it. This is explained by the theory of psychological ownership, which refers to the perception of ownership on a specific tangible or intangible object (Pierce, Kostova, & Dirks, 2001). Psychological ownership theory has been employed in explaining a wide range of human social behaviors such as workplace behaviors (Peng, 2013) and consumers' digital piracy behaviors (Sinclair and Tinson, 2017).

According to Connelly et al. (2012), knowledge hiding has three main forms, namely rationalized hiding where a justification for the hider's failure in providing the requested knowledge is provided, evasive hiding where the hider offers incomplete information, and playing dumb where the hider acts as if he/she is unaware of the knowledge requested. Using a construal lens, Connelly and Zweig (2015) further studied how the knowledge seeker perceived different forms of knowledge hidings of the knowledge hider. More specifically, from the view of the knowledge seekers, the evasive hiding and playing dumb would be harmful to the relation between the knowledge hider and seeker, while rationalized hiding would not, and it may improve their relation instead. Among all these three forms of knowledge hiding, evasive hiding would lead to the most severe negative implications as the knowledge seeker may engage in retaliation in the future while playing dumb would motivate the seeker to stay away from the knowledge hider (Connelly and Zweig, 2015). As concluded by Xiao and Cooke (2018), who provided a detailed review on knowledge hiding research to date, the consequences brought by knowledge hidings are not always negative. In some situations, such as rationalized hiding, it may bring positive effects to the relation between knowledge seeker and hider. However, the boundary conditions of eliciting the positive impact of knowledge hiding remains unclear (Xiao and Cooke, 2018).

### ***2.1 Knowledge Hiding in international R&D teams***

R&D team members might develop a bond with the knowledge. He or she is more likely to perceive this piece of knowledge as personal intellectual property with lower intentions to share with others when requested. For R&D team members, knowledge is highly likely to be seen as the core competitiveness of an individual within a team, and sharing specific knowledge with team members might threaten an individual's growth, promotion or importance (Huo et al., 2016). To alleviate the potential threats, an individual with high-level perception of psychological ownership of his or her knowledge might be less willing to share knowledge with others, as this would enable them to maintain a certain level of control and self-efficacy on their knowledge.

The distrust between the knowledge hider and knowledge seeker is argued to be one of the crucial interpersonal factors that lead to knowledge hiding with international R&D teams (Bogilović et al., 2017; Connelly et al., 2012; Hurtado-Torres, Aragon-Correa, & Ortiz-de-Mandojana, 2018; Iwasa and Odagiri, 2004). Knowledge hidiers may withhold specific knowledge from knowledge seekers when distrust exist between them, and the hider may perceive the seeker to be suspectable in terms of the purpose of requesting knowledge from the hider. The distrust relationship could be observed between team members or co-workers, and it could also be found in a supervisor-supervisee dyad (Černe et al., 2014). Beside distrust, previous negative workplace experiences may also trigger knowledge hiding, and it would increase the possibility of future knowledge hidings as the seeker may develop a negative reciprocity norm based on the experience of failing to request a specific knowledge from a hider. From a social exchange perspective, knowledge hiding would occur when the hider perceive that the reward of sharing this piece of requested knowlledge is less than the cost or the risk of doing it.

Knowledge hiding is also argued to be triggered by numerous organizational-level antecedents such as orgnizational climate and organizational practice (Connelly et al., 2012; Peng 2013; Ferraris, Santoro, & Dezi, 2017; Kim, Min, & Cha, 1999; Eisenbeiß and Boerner, 2010). For instance, in a R&D team or an organization where knowledge sharing is encouraged with various strategies, knowledge hiding might be regarded as a socially unacceptable behavior, and the team members and employees may be more likely to share specific knowledge when requested (Connelly et al., 2012). To investigate how organizational level factors affect knowledge hiding, Malik et al. (2018) have examined the impact of organizational politics, which often lead to counterproductive workplace behaviors, on knowledge hiding. Their research findings indicates that employees who perceive a higher level of organizational politics would have higher intentions to conduct knowledge hiding. This relationship, according to their research, could be moderated by individual's professional commitmment. More importantly,



they have found that R&D team members' perceived politics would have a direct negative impact on their creativity, which is crucial for R&D teams to produce creative outcomes.

Knowledge hiding, as being one counter-productive workplace behavior, might bring undesired or negative influences on R&D team members and the team or the organization as a whole (Bogilović et al., 2017). At the individual level, knowledge hiding has been confirmed to have negative impact on individual creativity for both the knowledge hider and the knowledge seeker. This is primarily due to the fact that employees who hide their knowledge because they regard sharing specific knowledge with others may bring negative effects as knowledge seekers may identify his or her weaknesses from the disclosure of information (Černe et al., 2014). This defensive view toward knowledge would impose a negative impact on R&D team members' creativity (Baas, De Dreu, & Nijstad, 2008). Previous research has also argued that the reduced knowledge sharing behavior in a knowledge intensive team or organization may prevent team members from absorbing different perspectives on an idea and lessen his or her ability to generate creative ideas (Černe et al., 2014). Another explanation of the negative impact of knowledge hiding on employee creativity could be demonstrated through the reciprocal distrust loop proposed by (Černe et al., 2014). In their framework, when the knowledge seeker successfully recognizes the knowledge hiding, he or she may develop a feeling of distrust in terms of the knowledge hider, which leads to the knowledge seeker's reciprocate knowledge hiding. This reciprocate knowledge hiding would reduce the creativity of the initial knowledge hider, as this reduces the informational input in regarding to his or her potential creative ideas.

In sum, existing research focusing on exploring the antecedents of knowledge hiding have identified individual and organizational-level factors that may trigger this specific behavior which is harmful to the creativity of the R&D teams and organizations. However, the social level of factors leading to knowledge hiding behavior remain largely unexplored. The current research would not only explore the personal and organizational level factors of knowledge

hiding, but also factors at the social level. Therefore, the first two research question of the current paper is:

*RQ1: What are the factors, especially those at the social level, leading to knowledge hiding intentions within international R&D teams?*

*RQ2: How do these factors lead to knowledge hiding intentions within R&D teams?*

## ***2.2 An overarching theoretical framework: theory of planned behavior***

Knowledge hiding, as being one of the social behaviors in the workplace, has been explained by scholars primarily using theoretical frameworks including the social exchange theory and the psychological ownership theory (Pierce, Kostova, & Dirks, 2001). The use of these theoretical frameworks has laid a solid foundation for understanding the antecedents of the knowledge hiding. However, to reach a more comprehensive understanding of the behavior in which factors from the individual, organizational and social levels, an overarching behavioral theory could be employed.

The theory of planned behavior (TPB) by Ajzen (1991) , has been greatly used in research on various kinds of human behaviors across different disciplines (see Branley and Covey 2018; Fleming et al. 2017; Mital et al. 2017; Starfelt Sutton and White 2016). TPB is based on the assumption that the antecedents of human behavioral intentions are the results of an individual's behavioral, normative and control beliefs toward a specific behavior. According to the theory, an individual's actual behavior could be predicted by his or her behavioral intentions, and the behavioral intentions are jointly determined by the individual's approaches toward the behavior, perceived subjective norms and perceived behavioral control of the definite behavior (Ajzen,1991).

Recent developments concerning TPB includes the important theoretical expansion of its normative influence part. Subjective norms, which are used to capture an individual's perceived social approval or pressure of conducting a specific behavior, is further expanded into two aspects, specifically descriptive and injunctive norms (Cialdini, Reno, & Kallgren, 1990). Descriptive norms, which are the perceptions of individuals on what most other do in terms of a behavior, provide the unique informational value for the decision-makers. Injunctive norms, which are the perceptions of individuals on what others expect them to do, consists of a form of explicit request from an individual's social referents (Eriksson, Strimling, & Coultas, 2015). The distinct differences in the motivational sources of injunctive and descriptive norms have stimulated a large amount of studies investigating the relative effectiveness and the functioning mechanisms of these two types of norms in affecting our behaviors (i.e. Lac and Donaldson 2018; Melnyk et al. 2011, 2013).

According to TPB, an individual's knowledge hiding intentions are jointly determined by his or her attitudes, subjective norms and perceived behavioral control toward knowledge behavior. More specifically, if an individual is holding more favorable attitudes toward knowledge hiding, perceives greater social approval or less social pressure and is more confident in successfully conducting the behavior, he or she would be more likely to engage in actual knowledge hiding. TPB, as being a comprehensive theory that is capable of explaining and predicting various human social behaviors, could provide the potential theoretical framework in reaching a holistic understanding of the knowledge behavior with R&D teams. However, the constitution of R&D team member's attitudes, subjective norms and perceived behavioral control toward knowledge hiding remains largely unknown to scholars as well as practitioners. Having this knowledge would enable managers of the R&D team, the HR professionals and the top management team of an organization to design and implement effective corporate strategies and practices to reduce the frequency of knowledge hiding within their teams or organizations.

### **3. Research Design and Methodology**

Due to the exploratory nature of the current individual-level study, a qualitative approach would be employed to answer the research questions from a constructivism point of view (Creswell & Clark, 2018). The use of qualitative approach could enable researchers to reach a more detailed understanding of a human social behavior, as it helps in valuing the voices from different R&D team members and employees (Maxwell & Raybold, 2015). Since the aim of the current study is to explore the nuanced details in what constitute an individual's attitude, subjective norms and perceived behavioral control toward knowledge hiding, the use of a qualitative approach would be suitable for the project in answering this "what" question, as it would reveal the in-depth insights from analyzing the qualitative data (Harrison, 2013). Therefore, in order to retrieve valid and rich qualitative data in answering our research questions, semi-structured in-depth interviews (Arsel, 2017) are conducted with R&D team members from international locations to collect qualitative data, which are analyzed through an inductive approach with the qualitative data analysis package NVivo.

### ***3.1 Sampling technique and respondents***

The interview sample was recruited through a two-stage strategy (i.e. purposive sampling and snow-balling). First, a purposive sampling approach (Curtis, Gesler, Smith, & Washburn, 2000) was adopted and we recruited the international R&D team members from different sectors based on the main criteria that they should have knowledge hiding experience within their team or organization. This sampling method, rather than random sampling as used in quantitative studies, allows us to reach the interview participants with relevant experiences, and the interviews conducted with them could reveal important insights of knowledge hiding. Then, in the second stage, we apply for the snowball sampling where the interviewees suggested other additional respondents who have experienced a knowledge hiding situation. In total, we have conducted 15 interviews, with 9 in the form of face-to-face and another 6 through skype. A number of 15 interviews is considered a good level to reach a theoretical saturation where no new theoretical insights could be identified through the interview data (Guest, Bunce, &

Johnson, 2006), which means that the additional interviews would not contribute further in terms of the overall story (Corbin & Strauss, 2008).

In order to alleviate the effect brought by the sensitivity of the research topic (i.e. knowledge hiding), to all interviewees were not only briefly introduced the research context, but also were also explained the guarantee of the anonymity and confidentiality of the interview data. The latter was a crucial aspect because of some interviewees might concern that the interview would impose a negative impact on their jobs. The interviews lasted for an average of 40 minutes were recorded and transcribed by one of the Authors who also took notes during the interviews. Each interviewee was paid with an Amazon voucher at the end of each interview for their time and effort. The initial interview protocol was developed based on the comprehensive understanding of the antecedents of knowledge hiding and tested by a small-scale pilot test to improve the wording and reducing the ambiguity of the interview themes. The interview was conducted and the interview protocol was developed in a recursive manner: as the interviews were carried out, the interview protocol was updated according to the feedback from interviewees and was then used in the subsequent interviews to gain further and a more focused theoretical insight (Arsel, 2017).

Among all the interviewees, 9 of them are male. The interviewees were aged between 25-42 years old, with an average age of 31 years old and an average 3.8 years of R&D-related experience. They are currently working in the R&D team or department across various industries including higher education and research, financial technologies, artificial intelligence, manufacturing, automobile (blockchain related), and media industry. Our respondents come from different countries including China, U.K., U.S.A., India, Korea and France. The basic information of the interviewees is showed in Table 1.

(Please insert Table 1 *Descriptive Information of Interview Participants* about here)

### ***3.2 Coding strategy and reliability***

All the interview transcripts were analyzed with the help of the Qualitative Data Analysis Package NVivo 12. The coding of the interview transcripts was based on the theoretical framework of TPB (i.e. attitudes toward the behavior, subjective norms and perceived behavioral control) in addition to the strategy of open-coding where the emerging themes could be identified through the inductive analytical process. This coding strategy, used in the theory-guided qualitative research concerning human behaviors at the individual level, was adopted (Spiggle, 1994). To enhance the reliability of the coding output, two of the authors coded the interview transcripts separately. Then the coding results were carefully compared and the discrepancies in the coding results provided by the two coders were discussed with an independent faculty member specializing in knowledge management and organizational behavior who was not involved in the research team.

As the aim of the current study is to identify what constitutes knowledge hiders' attitudes, subjective norms and perceived behavioral control toward knowledge hiding, the coding process involved two stages. In the first stage of coding, open-coding was carried out and the first-order concepts were identified and named using respondents' original wording or words and phrases that were most effective and appropriate in summarizing participants' ideas (Saldana, 2016). Then, in the second stage of coding, the first-order concepts identified in the first coding stage were categorized into second-order themes which were then categorized into the aggregate dimensions (i.e. attitudes toward the behavior, subjective norms and perceived behavioral control).

## **4. Findings and Interpretations**

Based on the framework of the theory of planned behavior (Ajzen, 1991), the findings on the antecedents of R&D team members' knowledge hiding intentions are structured around attitudes toward knowledge hiding, the subjective norms surrounding knowledge hiding and

knowledge hiders' perceived behavioral control on knowledge hiding. Through the analysis of those three main antecedents of knowledge hiding intentions, a comprehensive understanding of what constitutes them was reached.

#### ***4.1 Knowledge hiders' attitudes toward knowledge hiding***

In order to assess knowledge hiders' attitudes toward knowledge hiding, the respondents were asked about questions on how they feel about the behavior and their knowledge hiding experiences. According to the three-dimensional approach in categorizing different attitudes, an individual's attitudes toward an object constitute of his or her affective evaluations (i.e. the emotions an individual associate with the object), behavioral evaluations (i.e. the evaluations of an object based on the past experiences with an attitudinal object) and cognitive evaluations of the object (i.e. the attributes an individual assigns to an attitudinal object) (Breckler, 1984). Through the analysis of the interview transcript, we found all the three dimensions of attitudes and the details within each dimension. The findings on knowledge hiders' attitudes toward knowledge hiding is illustrated in Table 2 in an inductive manner.

According to R1 (Female, 26), knowledge hiding gives her a sense of superiority with the team or an organization, as she believes that if she has a certain piece of knowledge that others' do not know, her supervisor would think highly of her and regard her as an outstanding team member. Therefore, the affective evaluations an individual associate with hiding his or her knowledge is the sense of superiority it brings. It involves a form of comparison between the individual and the other members of the same team. According to R1, the supervisor's recognition of her knowledge that is hidden from another team member may amplifies this sense of superiority, as the knowledge hider is thought highly of by the supervisor, and this may bring positive impact on an individual's future career prospects. Previous studies have identified the competitive work environment as one of the driving factors that lead to knowledge hiding, and being recognized by one's supervisor is the main strategy of securing one's position with an R&D team or organization (Kumar Jha & Varkkey, 2018).

One interesting point raised by R10 (Male, 33) is that knowledge hiding is helpful in achieving self-satisfaction. This is primarily due to the settings of working in an R&D team where collective goals of the team are valued much higher than the individual needs of the team members. According to him, one of the reasons to hide knowledge from a team member is that hiding this specific piece of knowledge would make him an important part of the team, as this piece of knowledge is important to the whole team and nobody else knows it. Working in a team sometimes means that the achievements of a team as a whole is more important than the individual achievement. Some team members may feel being less-valued in the team-setting, as the boundaries between individual contributions and the team's achievements could be ambiguous. In other words, it is often extremely difficult to identify which part of the team achievements is contributed by a specific team member. If this is the case, the team members who have a higher need for self-recognition or self-satisfaction would cultivate a higher intention to hide certain knowledge and would only contribute the knowledge when the boundaries are less ambiguous and the individual contribution to the team achievements is easier to recognize.

Another aspect of the behavioral evaluations of knowledge hiding experience is the belief that knowledge hiding could save one's time. Based on the statements of R7 (Male, 32), knowledge hiding is regarded as one workplace behavior to avoid wasting time. This may be caused by the knowledge-intensive character of R&D teams where each individual team member may possess different set of professional skills and knowledge. It might be time-consuming for one R&D team member to explain his or her specific knowledge clearly to another team member. This argument confirms the research finding of a previous study on the relationship between R&D team members' perceived time pressure and knowledge hiding. In their research, Škerlavaj et al (2018) have found a significant and positive relationship between perceived time pressure and knowledge hiding. This behavioral evaluation on knowledge hiding might be a result of the time-consuming experiences in responding to others' knowledge requests.



As for the respondents' cognitive evaluations of the knowledge hiding, they have assigned both positive and negative attributes to the behavior. For example, at the individual level, knowledge hiding is seen as a beneficial behavior, as it could save an individual's time (R2) and help in developing his or her confidence and professional skills (R8). At the team level, knowledge hiding may be regarded as beneficial as well. For instance, according to R10 (Male, 33) who is a senior manager within an R&D-driven organization specializing in Blockchain technologies, he would intentionally hide certain pieces of knowledge from newly admitted staffs to the team, as this would help cultivate their ability to retrieve relevant information and avoid making them dependent on the knowledge of superiors. Knowledge hiding in the stage and process of new staff training may contribute to their creativities, which is beneficial to the R&D team as a whole.

Besides the benefits of knowledge hiding, either to the individuals or to the team as a whole, knowledge hidiers are also aware of the potential risks it brings. A large portion of the respondents admitted that they are aware of the negative consequences it brings to the creativity of the team (i.e. R14), and even if they are aware of them, they still conduct knowledge hiding within the R&D teams or organizations. The reason for this might be the comparison an individual team member makes between the personal risks of knowledge hiding and the risks of knowledge hiding at the team level. An individual might concern that if he or she respond to another team member's knowledge request, the knowledge seeker would be in a more favorable organizational position which would worsen the career prospects of the hider.

(Please insert Table 2 *Knowledge hidiers' attitudes toward knowledge hiding* about here)

One important finding emerged from the open-coding procedure is that perceived organizational culture concerning the fair competition may affect the way the R&D team members perceive knowledge hiding. In a previous study, Malik et al. (2018) has identified the significant relationship between the perceived organizational politics (i.e. the unfairness within

a team or organization) and an individual's knowledge hiding. More specifically, if the employee perceives the competition within the team and the organization is fair, transparent and open, he or she may not worry too much about the risks of the knowledge sharing behavior. As a result, he or she would be less likely to hide knowledge from co-workers, as this would have minimum impact on his or her promotion opportunities or organizational standing:

*"Sometimes the competition within the team and organization should go in positive, open, transparent and fair ways. Once this is achieved, risks of knowledge sharing would be low and people's knowledge hiding intentions would be reduced."*

[(R6, Female, 39)]

Employees would consider carefully the risks and benefits of knowledge hiding before making the decision on whether to hide knowledge from team members or co-workers. One respondent has summarized that she would always conduct a cost-benefit analysis before making the decision on whether or not to hide specific knowledge, as it may lead to positive or negative consequences, both predictable and unpredictable. The degree of knowledge hiders' deliberation on the cost and benefits of his or her knowledge hiding may be related to the perceived distrust between the knowledge hider and seeker. This indicates that the perceived benefits and risks at the individual level might be an important antecedent of the knowledge hiding of the R&D team members:

*"I would always perform a cost-benefit analysis in my mind and then decide whether or not to give someone the requested knowledge. If the costs or risks is much greater than the benefits, I would probably hide from him or her. I can't control the way he would use of piece of knowledge from me, and this might lead to awful results. So, (in general) I would prefer to hide from such requests."*

[(R9, Female, 25)]

#### ***4.2 Subjective norms surrounding knowledge hiding***

In a recent review on knowledge hiding research conducted by Xiao and Cooke (2018), they call for scholarly attention on the “societal differences that may affect interpersonal interactions and individual behaviors.” In the current study, we take the perspective of social norms to examine the in-depth details of how an individual’s knowledge hiding intention is affected by the social context (i.e. others’ behaviors and societal expectations). Based on the conceptual expansion of subjective norms into descriptive norms and injunctive norms by Cialdini et al. (1990), the findings and interpretations on the perceived social norms around knowledge hiding is structured in two main dimensions (i.e. descriptive and injunctive norms). Based on the statements provided by the respondents, we concluded two kinds of descriptive norms: knowledge hiding is common and knowledge hiding is understandable. From an international perspective, the impact of culture on knowledge hiding intentions were also identified. The example insights and coding procedure are detailed in Table 3 below.

(Please insert Table 3 *Knowledge hidiers' subjective norms surrounding knowledge hiding* about here)

The rich data on the descriptive norms around knowledge hiding reflects the commonness of the behavior in R&D teams. According to R3, knowledge hiding could be frequently observed, and it could be seen as a strategy to protect privacy (i.e. research outcomes), especially in a knowledge-intensive work environment. According to Cialdini, Reno, & Kallgren (1990), descriptive norms are the perceptions on what others do, and they provide an informational value to the decision-maker concerning the common and acceptable practice in terms of the behavior of interest. If an individual perceives that a behavior is normal and common, he or she would be more likely to conduct this behavior. Therefore, the wide spread of knowledge hiding may increase the frequency of knowledge hiding in the workplace. Several of our respondents also stated that knowledge hiding is not only common in their workplaces, but it is also an acceptable or understandable behavior. For example, R5 (Female, 25) showed his empathy on other knowledge hidiers and stated the knowledge might be important to hidiers and he might do the same thing in a similar situation.

According to another respondent, the perception or the acceptance of knowledge hiding in a team setting is dependent on the characteristics of the knowledge itself. In other words, if the knowledge being hidden by the knowledge hider is not related to the task or not important for the collective goals, then these knowledge hidings could be accepted. Previous researches have also identified the significant effect of task-related characteristics on knowledge hiding. For example, using psychological ownership theory, task dependence was confirmed as a moderator between the perceived knowledge value and the perceived territoriality of the knowledge which would increase knowledge hiding intentions (Huo et al., 2016). Task dependence refer to the degree to which the tasks within a team is connected. If the task dependence is high, an individual would need more informational input from team members to successfully complete a task of his or her own. Therefore, the knowledge hiding would be unacceptable if the knowledge being requested by the seeker has a higher task dependence (i.e. important for completing the tasks). Task dependence, as one of the task-related characteristics of knowledge, might be influencing the way knowledge hiding is perceived by the R&D team members:

*"I have observed some knowledge hidings, and I think they are quite normal. The knowledge they hide does not affect the team as a whole, as the knowledge is not required for the team development. IF this is the case, then the knowledge hiding becomes tolerable, as it would not affect others' job."*

[(R8, Male, 33)]

It is interesting to note that, besides organizational culture and task dependence, the level of job position within a R&D team or organization would also affect the way an employee thinks about knowledge hiding. While several of our respondents (i.e. staffs with junior positions in the R&D team) regard knowledge hiding is acceptable and common, for senior managers of an

R&D team (i.e. R10), subordinates' knowledge hiding may have informational value regarding their involvement in the work or their work attitudes:

*"I have seen a lot of knowledge hiding among our junior staffs and I have had discussions with senior managers on this topic. We concluded that if an employee conducts knowledge hiding, his or her job performance evaluations would be downgraded as this might reflect a passive work attitude."*

[(R10, Male, 33)]

Besides descriptive norms surrounding knowledge hiding, injunctive norms, which functions with a different motivational source at the societal level, could also affect R&D team members' knowledge hiding intentions. According to Cialdini, Reno, & Kallgren (1990), injunctive norms refer to the perceived social pressure of conducting a specific behavior. Rather than providing the informational value to the individuals in support of the decision-making process, injunctive norms involve an explicit request from the social referents concerning the acceptable practice toward a behavior. Based on the analysis of the transcripts, we concluded that there are three kinds of injunctive norms concerning knowledge hiding with the R&D setting: knowledge hiding is a personal choice, knowledge hiding is imperative and knowledge sharing is imperative.

Social norms are the perceptions of the appropriateness of conducting a specific social behavior, and it is the mechanism of how our behavioral decisions are affected by the people around us and those who are important to us. When discussing the perceived social influence on knowledge hiding decisions, the knowledge hidiers stated that the decision should be made by themselves, which means that the impact of others is limited. Also, it seems that the relationship between supervisor and subordinate could affect subordinate's knowledge hiding intentions. More specifically, if the relationship is not good or distrust exists between the supervisor and subordinate, the subordinate is more likely to engage in knowledge hiding (R2). According to

R11 (Female, 31), it is not our responsibility to respond to others' knowledge requests, especially when the knowledge is not essential for the teamwork:

*"It is not a simple right or wrong question, and everyone should be able to choose whether or not to hide knowledge from someone. If the knowledge is not necessary for the smooth operation of the team, then we are not responsible for telling others what we know, especially for some knowledge in a specialized area or field."*

[(R11, Female, 31)]

Knowledge hiding is regarded as an unacceptable workplace behavior by some of the respondents. These respondents usually attach a great importance to the benefits of sharing knowledge with team members. For example, according to R12 (Male, 37), responding to others' knowledge requests could boost the development of the team as a whole. From a perspective of helping others, he stated that if we could respond to others' request, it would demonstrate our area of expertise so that when someone need further help in this area, he or she would know where to go to. Therefore, in his mind, knowledge hiding is unacceptable as it would hinder the development of the team.

Moreover, another respondent stated that it was the organizational culture on knowledge sharing made him think that knowledge hiding is unacceptable. In his organization, knowledge sharing activities are common and encouraged by the management team. It seems that the encouraging management practices as well as the organizational culture on knowledge sharing are useful in eliciting injunctive norms of R&D team members against knowledge hiding, which in turn would reduce the behavior. R15 (Male, 35), who is a general manager of a smart manufacturing R&D team, confirmed this idea and shared his thoughts on creating knowledge sharing culture within the R&D team:

*“I would always encourage my team members to share whatever knowledge they know to their fellow team members. Each week, we would hold a meeting together, and one of the team members needs to give a presentation on whatever topic he chose to share. According to own experiences, giving them (i.e. the team members) the flexibility and autonomy on knowledge sharing activities would have a great positive impact on creating a knowledge sharing culture in a company or a team. The encouragements from the managers are also important, and the whole team, including the managers, would benefit from this kind of knowledge-sharing activities.”*

[(R15, Male, 35)]

On the contrary, some respondents regarded knowledge hiding as imperative to achieve success within an R&D team or any other organizations. Their arguments are reached through the perspective of seeing knowledge as an important resource in terms of personal development. One interesting and insightful point of view was demonstrated by R9 (Female, 25), a female researcher in a consulting firm. According to her statements, knowledge hiding is without doubt a necessity of almost all the organizations, as it helps us to secure and differentiate our job positions. It is the information asymmetry that creates the different job requirements for each position in an organization, and if there is no knowledge hiding, someone else would take up your position when he or she is equipped with all the explicit and tacit knowledge required for the job right from you.

Another interesting finding is that the way R&D team members are affected by others seems to be correlated with the culture of the country where the team locates. To assess the degree to which the respondents' knowledge hiding decisions are affected by their team members and supervisors, they were asked questions such as “Do you think your knowledge hiding decisions would be affected by your co-workers? Why?” According R4 (Male, 25) and R9 (Female, 25), whether or not to conduct knowledge hiding should be a personal choice, and this behavior would not be affected by others around them. It is interesting to find that respondents with these

statements come from countries that individualism is regarded as dominating (Wagner & Moch, 1986). R4 is from an R&D team based in the U.K. and R9 comes from an R&D team in the U.S.A. Another respondent who had given a similar response comes from France:

*“It is obviously clear for most of the team members that knowledge sharing among team members is good for the team as whole. I would say that this decision on whether or not to hide knowledge from a co-worker has nothing to do with other team members. This is solely a personal decision, and no one is going to blame on you if you do hide some knowledge.”*

[(R12, Male, 37)]

The R&D team members from countries where the culture was regarded as dominated by collectivism have reported different viewpoints on this issue. In their mind, knowledge hiding might be considered as inappropriate as they have observed others' knowledge sharing behaviors and perceived little approval of conducting knowledge hiding in the R&D team. For instance, an R&D team member from China has stated that:

*“I believe that our behaviors would be affected by the people around us, and that's why I am trying my best to stimulate a knowledge sharing culture within my team. If I see somebody in the R&D team is willing to share his or her knowledge with me or other colleagues, I would probably do the same as I wish to learn from him, and it seems to be a good thing for our team as a whole. In managing my team, I would ask my team members to actively share their knowledge with co-workers, as I have benefited a lot from the knowledge other share with me during my career, and it really gives me a bad feeling when I hide something from my team members.”*

[(R15, Male, 35)]

Based on these findings, it could be concluded that the culture of the country where the R&D team locates might have an impact on how the R&D team members' knowledge hiding



decisions are affected by their social referents (i.e. colleagues, supervisors, etc.). To be more specific, R&D team members from individualistic cultures might make their knowledge hiding decisions based on their own values and attitudes, but for those from collectivistic cultures, their knowledge hiding decisions might be more likely to be affected by their referents. Therefore, the culture of the countries where the R&D locates might moderate the impact injunctive and descriptive norms have on R&D team members' knowledge hiding decisions.

#### ***4.3 Knowledge hidiers' perceived behavioral control on knowledge hiding***

According to Ajzen (1991), besides attitudes toward knowledge hiding and subjective norms about it, perceived behavioral control could affect the individual willing to employ a knowledge hiding practice. Perceived behavioral control is the perceived confidence in successfully conducting the behavior of interest. From the interview and the analysis of the data, we have identified the impeding as well as facilitating factors that lead to different level of behavioral control toward knowledge hiding. The example insights and coding procedure are detailed in Table 4 below.

(Please insert Table 4 *Knowledge hidiers' subjective norms surrounding knowledge hiding* about here)

As for the impeding factors in terms of the behavioral control toward knowledge hiding, the major concerns are that it may be identified by some smart team member at the time of request (R13), or it may be identified by a team member at a later time (R8). The facilitating factors leading to higher behavioral control toward knowledge hiding come from the differentiated area of expertise and the different length of experience of working in the field. According to R12 (Male, 37), knowledge hiding is easily done especially when the knowledge seekers is from another area of expertise and has no or little knowledge on the information needed. As another respondent stated, the confidence in successfully hiding the knowledge could also generate from the comparative longer experience of the knowledge hider.

## 5. Discussion and Propositions

As resulted, knowledge hiding practices can be affected by three dimensions, specifically attitudes toward the behavior, subjective norms and perceived behavioral control.

The R&D team members' attitudes toward knowledge hiding were categorized into three dimensions, namely the affective evaluations, behavioral evaluations and the cognitive evaluations toward the behavior (Breckler, 1984). For affective evaluations, knowledge hiding could bring hidiers with a sense of superiority; for behavioral evaluations, the R&D team members regard knowledge hiding as a strategy to fulfil personal satisfaction and to avoid waste of time; for cognitive evaluations, R&D team members are aware of the benefits and risks of conducting knowledge hiding at both the group and individual level. A cost-benefit analysis is often performed by the knowledge hider when deciding on whether to hide a specific piece of knowledge. Previous studies have utilized theoretical lenses such as psychological ownership theory (Pierce, Kostova, & Dirks, 2001) and social exchange theory (Tsay, Lin, Yoon, & Huang, 2014) to identify the personal factors leading to knowledge hiding, and factors such as distrust, perceived career insecurity, lack of recognition were identified. The current research has contributed to the understanding of knowledge hiding by exploring the factors from a more focused attitudinal perspective. Besides, the current study has also identified the potential interplay between R&D team members' perceived organizational politics and their attitudes toward the behavior. If they perceive that the competition within the R&D team or organization is fair and open, they might perceive that knowledge hiding won't affect their career prospects which would result in a reduced intention to engage in knowledge hiding. Therefore, we propose:

**Proposition 1:** *Knowledge hidiers' attitudes toward knowledge hiding are formed jointly by their affective, behavioral and cognitive evaluations of the behavior, and their perceived organizational culture on fair competition may moderate their evaluations.*

Besides personal factors leading to knowledge hiding, previous studies have also identified organizational-level factors that may affect R&D team members' knowledge hiding. Subjective norms, including both injunctive and descriptive norms, are confirmed as important antecedents of different social behaviors (Cialdini & Goldstein, 2004; Goldstein, Cialdini, & Griskevicius, 2008; Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2018). In the current research, we extended the previous investigations on knowledge hiding by identifying the facilitating factors of knowledge hiding at the societal level. This was achieved by identifying the knowledge hidiers' perceived subjective norms surrounding the behavior. The findings on subjective norms are categorized into two dimensions, namely descriptive norms (i.e. what others do) and injunctive norms (i.e. what others approve). According to the analysis, we found that the knowledge hiding is widely observed by the knowledge hidiers and they regard it as common and understandable if the knowledge being hidden is not required for the smooth operation of the team. Injunctive norm of knowledge hiding was distributed on the dimension anchored by unacceptable and imperative, which indicates that the injunctive norms of knowledge hiding would differ according to different factors of the R&D team such as the leadership styles of the management team and the organizational culture in terms of knowledge sharing. In addition, we identified the impact of culture on how the R&D team members' decisions on knowledge hiding from an international perspective, and it seems that R&D members located in countries where individualism is dominating, they might be more likely to be unaffected by others' behaviors and opinions. Therefore, we propose:

**Proposition 2:** *Knowledge hidiers' intentions to engage in knowledge hiding are influenced by their perceived social norms surrounding the behavior. While knowledge hiding is widely observed by the knowledge hidiers within R&D teams, their perceived appropriateness of conducting the behavior differs, and this may be contributed by their perceived organizational culture of knowledge sharing, the perceived management style of their superiors as well as the culture of the country where the R&D team locates.*

An important element of TPB is the perceived behavioral control, which is added into the theoretical framework to enhance the theory's ability in explaining social behaviors in which an individual does not have full control over the behavior. In previous research, a similar theoretical construct from social cognitive theory (Bandura, 1986), namely self-efficacy, was discussed in the knowledge hiding research. However, previous research discussing self-efficacy has focused on the character of the requested knowledge rather than the hiders' perceived confidence of successfully conducting the behavior (Kumar Jha & Varkkey, 2018). Therefore, the current study has made its unique contribution to the literature by identifying knowledge hiders' control beliefs on the behavior, and impeding factors that would reduce the perceived control as well as the facilitating factors that would increase the perceived control over knowledge hiding are identified and discussed. Based on the above findings and interpretations, we therefore propose:

**Proposition 3:** *The chances of being identified by smart team members at the moment of request and the chances of identified by team members at a later time are the impeding factors to gain control over the knowledge hiding. Meanwhile, knowledge hider's and seeker's different area of expertise and perceived experience in the field are the major factors leading to an increased perceived control over the behavior.*

Based on the above analysis, a comprehensive model of knowledge hiding which includes both the personal, organizational and social-level factors is reached. Figure 1 below illustrates this theoretical framework of knowledge hiding.

(Please Insert Figure 1 *Theoretical Framework of Knowledge Hiding* about here)

## **6. Conclusion and Future Research Directions**

The existing literature has recognized the negative impact of knowledge hiding on R&D teams and organizations, especially on the creative outcomes of the team members and employees.

However, the understanding of the knowledge hiding was incomplete as the societal level factor leading to knowledge hiding have been rarely discussed (Xiao & Cooke, 2018). Therefore, insights on how the knowledge hiding decisions are affected by the people around us are needed, as this would lead to a more comprehensive understanding of the behavior as well as its antecedents. In this study, this was achieved by conducting an exploratory qualitative study using the theory of planned behavior (Ajzen, 1991) as the guiding theory.

### ***6.1 Theoretical Contributions***

The research findings would provide scholars with a comprehensive theoretical framework in examining knowledge hidings within R&D teams. In order to reduce the impeding factors in the workplace that hinders creativity of the team members and employees, the comprehensive theoretical framework as well as the in-depth examination of the nuanced details of the knowledge hiding antecedents are needed. The research outcomes could then be used in developing scales assessing R&D team members' personal, organizational and social factors as well as their intentions to engage in knowledge hiding. The scales could then be used in a survey in further research into other aspects of knowledge hiding. For example, the study gives the details of what constitutes knowledge hiders' attitudes, subjective norms and perceived behavioral control over knowledge hiding.

Besides, the study also identified potential moderators to the framework. Specifically, perceived organizational culture on fair competition would potentially moderate the relationship between attitudes and knowledge hiding intentions; perceived organizational culture on knowledge sharing may moderate the impact of subjective norms on knowledge hiding intentions. Previous studies have also identified the impact of organizational justice as an important driving factor of knowledge hiding (Connelly et al., 2012; Huo et al., 2016). However, the current study not only confirmed this point of view, but also gives detailed information of how organizational factors affect knowledge hiding intentions. Meanwhile, the international perspective taken by the current research helped in generating insights on the

impact of culture on R&D team members' knowledge hiding behaviors. In general, the study provides a comprehensive theoretical framework which would nudge further research on knowledge hiding and its consequences on innovation.

## ***6.2 Managerial Implications***

Managers of R&D teams could benefit from this research to develop strategic and managerial practices aimed at discouraging knowledge hiding within R&D teams considering the negative impact it has on employee creativity. HR professionals could also design and implement specific employee activities accordingly. According to the research findings, changing R&D team members' attitude, subjective norms and perceived behavioral control over knowledge hiding would result in a significant change in their knowledge hiding intentions.

perceived organizational politics or the perceived fairness of competition within the R&D team and organization would impose an impact on how the R&D team members and employees construe knowledge hiding, which in turn would affect their intentions to engage in this behavior. Therefore, it is imperative for the management team within the R&D teams and organizations to create and maintain an environment of fair competition where the decision processes on promotions, punishments and rewards are made open to all the team members and employees. This would have the potential to alleviate their perceived negative consequences of knowledge sharing, which would help in enhancing the knowledge transfer as well as innovation within the team.

Similarly, perceived organizational culture on knowledge sharing have the potential to influence how R&D team members and employees to be affected by others knowledge hiding and their perceived appropriateness of the behavior. Hence, the top management team should adopt strategies in creating and encouraging knowledge sharing culture within the R&D teams, as this would cultivate the injunctive norms against knowledge hiding which would reduce the frequency of the behavior.

From an international perspective, considering the fact that R&D team members located in the countries where individualism is dominating is more likely to be unaffected by descriptive and injunctive social norms, more should be done in addition to cultivating a knowledge-sharing culture within the teams or organizations. For individuals who score high on individualism and have a high intention in conducting knowledge hiding, strategies to activate their collective-level self should be implemented together with strategies promoting knowledge sharing (White & Simpson, 2013).

### ***6.3 Limitations and future research directions***

Although the study provides pioneering insights in the comprehensive theoretical framework of knowledge hiding, it is still exploratory in nature. Future research endeavors on this topic could be to use survey data as well as archival data in empirically testing the theoretical framework proposed by the current study. A quantitative confirmatory study would further enhance the generalizability of the research findings (Creswell & Clark, 2018). For example, besides testing the direct relation between attitudes, subjective norms, perceived behavioral control with knowledge hiding intentions, the moderating effect imposed by the organizational-level factors (i.e. perceived organizational politics, organizational knowledge-sharing culture, and supervisor-supervisee relationships) could also be examined.

Moreover, as stated by Xiao and Cooke (2018), different theoretical approaches should be exploited in knowledge hiding research. The current study only uses the theory of planned behavior as the guiding theory, and this may neglect important theoretical aspects that would be provided by taking another theoretical perspective. Therefore, future research using different theoretical framework other than the theory of planned behavior is encouraged.

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Participant	Age	Gender	Sector	Time worked in the R&D team	Country where the team locates
R1	26	Female	IT/Real Estate	2 years	China
R2	29	Male	Media	3 years	China
R3	27	Male	Research	3 years	UK
R4	25	Male	Research	2 years	UK
R5	25	Female	Finance	2 years	China
R6	39	Female	Higher Education	3 years	India
R7	32	Male	Higher Education	2 years	India
R8	33	Male	Research	5 years	Australia
R9	25	Female	Professional Services	2 years	USA
R10	33	Male	IT/Blockchain	4 years	Korea
R11	31	Female	Professional Services	5 years	USA
R12	37	Male	Higher Education	7 years	France
R13	27	Female	IT	4 years	China
R14	42	Male	IT	8 years	China
R15	35	Male	Smart Manufacturing	5 years	China

Table 5 Descriptive Information of Interview Participants

Example Insights	First-order Concepts	Second-order Themes	Aggregate Dimensions
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<p><i>"It is not 100% right to say that I do not wish to share a specific piece of knowledge, it is the sense of superiority it brings leads to my knowledge hiding toward my team members. One day my supervisor would think highly of me since I know something that nobody else knows. This would make me stand out from the crowd." (R1)</i></p>	<p>Sense of superiority</p>	<p>Affective evaluations</p>	
<p><i>"When you are working in an R&amp;D team or any team-settings, personal achievements would be underestimated because we attach too much importance on the team-level achievements. If I know something that is important to the collective goals and nobody else knows it, this would help in improving my sense of achievement, which ultimately gives me more satisfaction toward myself." (R10)</i></p>	<p>Fulfilling personal satisfaction</p>	<p>Behavioral evaluations</p>	
<p><i>"I hide knowledge from him not because I don't like him. He is only a freshman here in the team and it is way too difficult and time-consuming to explain everything clearly to him." (R7)</i></p>	<p>Avoiding waste of time</p>		
<p><i>"I think knowledge hiding brings more benefits than harm to the individuals, but it would definitely harm the team as a whole." (R1)</i></p>			<p>Attitudes toward knowledge hiding</p>
<p><i>"Sometimes, knowledge hiding is good for myself because it saves my time, and it may improve my standing within the team." (R2)</i></p>	<p>Beneficial at the individual level</p>		
<p><i>"Knowledge hiding helps in building my confidence and develop my own ability in my field. It can help me to go further on the way of personal development." (R8)</i></p>			
<p><i>"When I am training the new staffs of our team, I would intentionally hide some knowledge because this may stimulate their creativity and ability to retrieve information." (R10)</i></p>	<p>Beneficial at the team level</p>	<p>Cognitive evaluations</p>	
<p><i>"I don't want to let anyone to show off in front of our supervisors using the knowledge from me. That's quite risky as your job performance or ability evaluations would be underestimated by the superior." (R1)</i></p>			
<p><i>"Knowledge hiding is necessary, especially in an R&amp;D environment. I have spent so much energy to come up with the new ideas, and these ideas are mine. I don't want others to steal them from me. I don't want my research result to get too much attention before publishing." (R7)</i></p>	<p>Perceived risks</p>		



<p><i>"We all know that knowledge hiding is bad for the team as it stops the useful knowledge to be effectively transferred from one to another. Sometimes, the creative idea is produced when you discuss your own knowledge with others, and others may give you some new perspectives of thinking based on your response." (R14)</i></p>			
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Table 6 Knowledge hiders' attitudes toward knowledge hiding

Example Insights	First-order Concepts	Second-order Themes	Aggregate Dimensions
<i>"It is normal to hide knowledge because they (i.e. other knowledge hiders) may wish the requestors to learn by themselves. It is a common behavior to protect our privacy." (R3)</i>	Knowledge hiding is common	Descriptive norms of knowledge hiding	Subjective norms surrounding knowledge hiding
<i>"I can sometimes sense that someone is hiding the knowledge from me when I requested them, and sometimes it is totally understandable as this knowledge might be regarded as an important resource by him and I might do the same thing." (R5)</i>	knowledge hiding is understandable		
<i>"To make it straight forward, the decision of whether to give others answers should be made by myself, not somebody else. Why should I suppose to share this knowledge with you when I have spent tremendous effort in gaining this piece of knowledge?" (R4)</i>	Knowledge hiding is a personal choice	Injunctive norms of knowledge hiding	
<i>"I don't like my supervisor as he is always pushing us to work overtime. He does not have the power to affect my decisions on whether to hide knowledge, and it is my own choice to make." (R9)</i>			
<i>"We should share the knowledge with our team members if they really need our help, this would help in boosting the development of our team. Sharing knowledge is good for us as it demonstrates your expertise, and when someone needs help in the future, he or she would know who to run to in the team." (R12)</i>	Knowledge hiding is unacceptable		
<i>"My supervisor cares much about our innovative outcomes, so he tries his best to encourage us in sharing knowledge with each other. Everyone in our team is open to share the knowledge, and knowledge hiding is not accepted. Knowledge sharing is a one-plus-one-more-than-two thing." (R4)</i>			

<p>"I think knowledge hiding is quite necessary. Knowledge is an important resource of personal development, and we all want to make the most of our resources. You don't want your value to be reduced by sharing knowledge with someone." (R5)</p>	<p>Knowledge hiding is imperative</p>		
<p>"I think the most important antecedent of knowledge hiding is the information asymmetry. Along with this information asymmetry, we would encounter transaction cost. Due to this transaction cost, knowledge hiding is a necessity so that we can secure our job or position within an organization." (R9)</p>			

Table 7 Knowledge hidiers' subjective norms surrounding knowledge hiding

<p><b>Example Insights</b></p>	<p><b>First-order Concepts</b></p>	<p><b>Second-order Themes</b></p>	<p><b>Aggregate Dimensions</b></p>
<p>"If someone is too smart that your knowledge hiding would be identified by him, I would give him the requested information in the end. It is just too hard to hide anything in front of smart team members." (R13)</p>	<p>Identifiable by smart team members</p>	<p>Impeding factors of control</p>	<p>Perceived behavioral control over knowledge hiding</p>
<p>"It is easy to hide some knowledge at the moment of being requested, but it would be awkward if the knowledge seeker found out that you actually know the answer at a later time." (R8)</p>	<p>Identifiable at a later time</p>		
<p>"It is so easy for me to hide knowledge from my team member, as we are doing different parts of the job." (R4)</p>	<p>Different areas of expertise</p>	<p>Facilitating factors of control</p>	
<p>"I am confident in hiding specific knowledge from the requestor. This could easily be done as the requestor does not hold too much information on the piece of knowledge I am going to hide. But you have to think about the consequences." (R12)</p>			
<p>"I think it is easy to hide some knowledge from my co-worker, as I have much more experiences than her, and she won't recognize that I am hiding the knowledge." (R9)</p>	<p>Longer experience in the field</p>		

Table 8 Knowledge hiders' subjective norms surrounding knowledge hiding

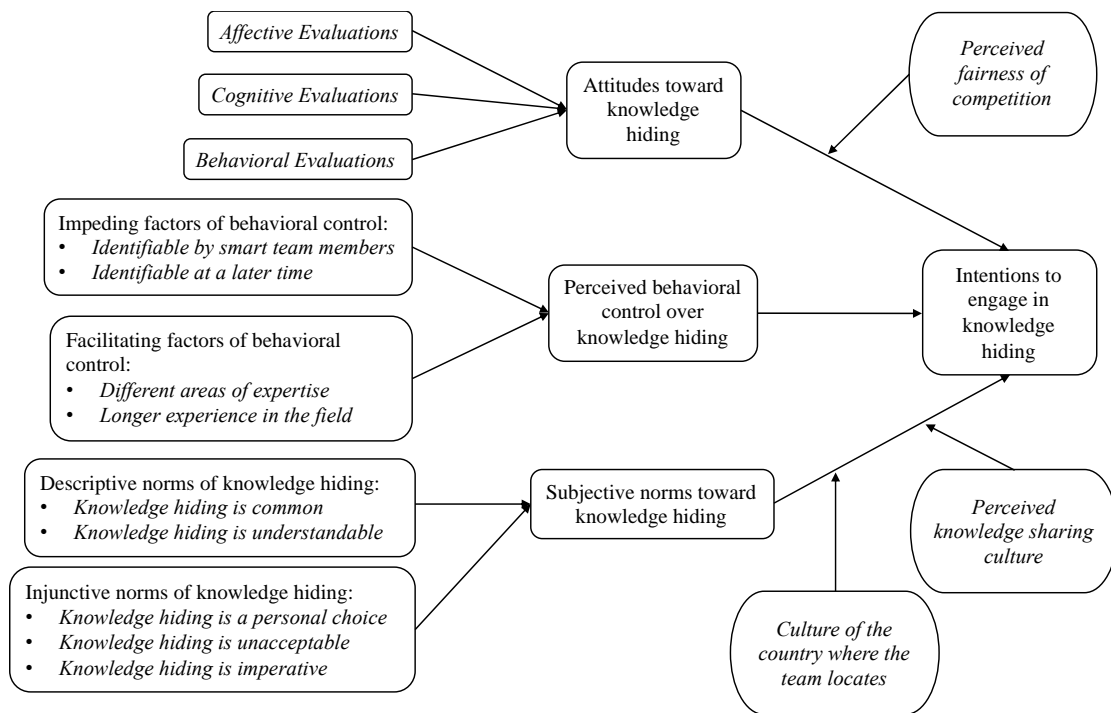


Figure 2 Theoretical Framework of Knowledge Hiding

**Chang Xiong** joined International Business School Suzhou at Xi'an Jiaotong-Liverpool University as a full-time Ph.D. student after completing a Master's degree in Economics from the School of Social Sciences at The University of Manchester in 2015. He is trained to conduct both qualitative and quantitative research within a range of management/marketing topics. During his Ph.D., he has also worked as a Research Assistant at SKEMA Business School Suzhou campus, where he was involved in numerous collaborative research projects with Tongji University and Shanghai University of Finance and Economics. Chang also has experiences in coordinating international academic conferences, and he has successfully co-organized the 2nd and the 3rd International Academic Conference in Chinese Management with the China Management Science Society in 2016 and 2017.

**Victor Chang** is a Full Professor of Data Science and Information Systems at the School of Computing, Engineering and Digital Technologies, Teesside University, Middlesbrough, UK. He was a very active and contributing key member at Research Institute of Big Data Analytics (RIBDA), XJTLU. He's an Honorary Associate Professor at the University of

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**Veronica Scuotto** (PhD, FHEA, MBA, BA-Honour) after working four years at the University of the West of Scotland (UK) and almost a year at the Pôle Universitaire Léonard de Vinci in Paris (France) as an Associate Professor in Entrepreneurship and Innovation, she has recently joined the University of Turin (Italy). She also got the Italian National qualification as Associate Professor in 2018. Her research interests are focused on SMEs, entrepreneurship and digital technologies. Her work has been featured in several peer to peer journals such as the Journal of Organizational Behaviour, Production Planning & Control, Technological Forecasting and Social Change, International Marketing Review, Journal of Knowledge Management, among others. She has authored two books. She is Editorial Assistant of the Journal of Intellectual Capital and an Editorial Board member of the Journal of Knowledge Management. Furthermore, Veronica received two awards as the best Paper of the EuroMed/SIMA track “New Challenges in Open Innovation” in 2016 and the “best-commended paper” in 2017 at the annual EuroMed Academy of Business (EMAB) conference. Additionally, in 2018 she has been recognized by the International Council for Small Business (ICSB) as a global partner of excellence.

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