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ORIGINAL ARTICLE



Knowledge sharing, hiding and hoarding: how are they related?

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ABSTRACT

This article consolidates the notions of Knowledge Hiding (KHi) and Knowledge Hoarding (KHo) and their relationship with Knowledge Collection (KC) and Knowledge Donation (KD). Following a systematic literature review involving content analysis, seventeen characteristics were identified. KHi is related to KC because, when someone hides and does not share the knowledge that somebody else requested, its collection will be impeded. KHo is related to KD, because when people hoard some unrequested knowledge, they avoid sharing what somebody else could take advantage of, even though they may be unaware of that fact. Thus, a new framework that articulates the inherent characteristics of KHi, KHo, KC and KD is proposed. From this new perspective, there is an expectation that future research could deepen the understanding of the incentives and obstacles to knowledge flow, and how their interaction will benefit or harm the performance of individuals and organisations.

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1. Introduction

Considered the most important Knowledge Management process (Alavi & Leidner, 2001; Senthil Velmurugan et al., 2010), Knowledge Sharing (KS) increases the collective value of intangible assets (Davenport & Prusak, 1998), by improving organisational response time, productivity, learning and innovative capacity (Karkoulian et al., 2010). It predicts contributions among individuals (Witherspoon et al., 2013), being understood as the degree of tacit and explicit knowledge exchange (Huang, 2009), whose flows are in constant flux and change (Fahey & Prusak, 1998) and include the creation, transfer and integration of distributed knowledge (Cabrera & Cabrera, 2005). It is also acknowledged that KS is related to fundamental organisational objectives: learning and innovative capacity (Karkoulian et al., 2010; Lin, 2007), new technologies (J. N. Lee, 2001), cost reduction (Andrew Huang et al., 2010), best practices (L. L. Lee, 2000), improved response time, productivity and learning capacity (Karkoulian et al., 2010), competitive advantage (Wang & Noe, 2010) and firm performance (Wang et al., 2012).

The demand and supply of knowledge are prerequisites for its sharing (Ardichvili et al., 2003). As a relationship between at least two parties (Hendriks, 1999), KS is defined as “the process where individuals mutually exchange their (implicit and explicit) knowledge and jointly create new knowledge” (Hooff & Ridder, 2004, p. 118). It occurs in social environments where different aspects of social capital encourage individuals to communicate their knowledge through

formal and informal channels of human interaction (Goksel et al., 2017).

Two underlying processes are represented in the KS concept: 1) Knowledge Donation (KD), an unrequested communication of knowledge, that takes place when an individual actively tells someone else about his/her knowledge, and 2) Knowledge Collection (KC), when the individual, seeking specific knowledge, actively consults someone else about his/her knowledge, thus motivating that person to share what was requested (Hooff & Ridder, 2004). KD and KC, being inherently tied to personal intentions (Tohidinia & Mosakhani, 2010), are components of the KS process, influencing a firm's performance through its absorptive capacity (Nodari et al., 2016).

The KS field still faces practical and theoretical challenges – for example, the management of undesired individual behaviours, such as Knowledge Hiding (KHi) and Knowledge Hoarding (KHo), which are two separate and independent concepts within the scope of KS (Kang, 2016). The processes of knowledge communication and reception, based on the transmission of intellectual capital (Nodari et al., 2016), could be prevented or restricted by knowledge retention. Although sharing practices should be ubiquitous in a knowledge-intensive collaborative environment, they do not always occur in organisational environments (Aljuwaiber, 2016), as people may be inclined to conceal what they know (Connelly et al., 2012).

The knowledge held and managed at the individual level is often beyond the control of the organisation (De Geofroy & Evans, 2017), because ensuring people

share their knowledge is not always possible (Kelloway & Barling, 2000). Indeed, the reluctance of employees to share knowledge with co-workers is not an unusual event in the organisational environment (Mettler & Winter, 2016; Webster et al., 2008). Despite the negative consequences that stem from the obstruction of KS, and regardless of organisational efforts to foster a broad sharing culture, people still resist engaging in KS practices (Connelly et al., 2012). As a consequence of such knowledge withholding, the spread of innovation will be restricted (Kang, 2016).

This situation has motivated scholars to analyse how the flow of knowledge is regulated (Mesner-Andolšek & Andolšek, 2015) through various concepts and definitions related to knowledge concealment, which is still considered an under-researched topic in the KS field (Holten et al., 2016). While prior research has established well-defined individual definitions and concepts within this subject area, it is still unclear how impediments to the flow of knowledge are related to KS and its underlying processes of KC and KD.

Previous studies have shown that undesired workplace behaviours, such as KHi or KHo (Connelly et al., 2012; Evans et al., 2015; Serenko & Bontis, 2016; Webster et al., 2008) will reduce the flow of knowledge, and thus weaken interpersonal and organisational performance (Evans et al., 2015). Although Connelly et al. (2012) have argued that sharing and concealment are not opposing concepts, there has been no significant progress beyond this understanding, nor any successful efforts to identify possible underlying relationships between these behaviours. Despite the apparent antagonism, it is certainly possible that the supply and retention of knowledge could exist simultaneously in social interactions.

While acknowledging that knowledge flow can be leveraged and constrained in the organisational context, the main objective of this study is to consolidate the notions of KHi and KHo and their relationships with KC and KD. Thus, this research is framed by the following questions: What are the main characteristics of KD, KC, KHo, KHi? How are these four concepts related?

Accordingly, adopting a positivist paradigm (Hirschheim, 1985) and drawing on Webster and Watson (2002) assumptions about developing a review of concepts, this article presents the results of a systematic literature review. The review is synthesised and concept-centric rather than author-centric (Watson, 2015), being based on the guidelines established by Wolfswinkel et al. (2013). The outcome is a new schema that articulates the inherent characteristics of KHi, KHo, KC and KD and that provide insights into potential conceptual links.

2. Theoretical background

Knowledge Hiding and Knowledge Hoarding are considered undesirable behaviours that hinder Knowledge

Sharing in the organisational environment (Qureshi & Evans, 2015). KHi is “an intentional attempt by an individual to withhold or conceal knowledge that has been requested by another person” (Connelly et al., 2012, p. 65). By contrast, KHo is “an individual’s deliberate and strategic concealment of knowledge and information or the fact that they may possess relevant knowledge or information” (Evans et al., 2015, p. 2).

According to Connelly et al. (2012), knowledge concealment is manifested through three different behaviours: evasive, rationalised, and “playing dumb”. The supply of incorrect knowledge or the deceptive promise to provide the requested knowledge in the future characterises the first type of KHi. The provision of a rational explanation for the non-sharing of knowledge characterises the second type of KHi. Finally, “playing dumb” KHi occurs when the individual falsely claims to ignore what was requested.

Anaza and Nowlin (2017) argue knowledge accumulation and retention could result from difficulties or impediments to Knowledge Sharing and may represent an interruption of information processing. As an opportunistic behaviour, KHo should remain concealed from colleagues because its recognition might well lead to feelings of distrust and stimulate reciprocal action (Černe et al., 2014). Once perceived, hoarding induces the withdrawal of social support and respect, causing social sanctions and negative effects on individual job performance (Dyer & Chu, 2011). In the organisational context, resistance to sharing unrequested knowledge is seen as a kind of dysfunctional behaviour (Trusson et al., 2017). Moreover, it will create and foster a distrust loop between the knowledge hider and knowledge seeker (Černe et al., 2014).

KHi and KHo are specific ways to retain and conceal knowledge that can result in underperformance (Connelly et al., 2012; Evans et al., 2015; Webster et al., 2008). While they are not necessarily in themselves Counterproductive Workplace Behaviours (CWBs), KHi and KHo could motivate such behaviours (Holten et al., 2016). A distinction must be made between these two categories of behaviour, as individuals may occasionally engage in KHi or KHo to protect or benefit themselves or their co-worker(s), while CWBs, by definition, result in detrimental effects or outcomes.

Counterproductive Workplace Behaviours are defined as voluntary employee behaviours that violate pre-established norms and rules in the organisational context, threaten co-workers individually, or the entire organisation (Robinson & Bennett, 1995). CWBs are derived from bad feelings, reflecting a previous negative emotional state, often arising from past malicious experiences (threats, fights, abuses, rejections), which make the individual prone to hostile intentions (Dodge, 1985; Broom, 1998).

Knowledge Sharing Hostility (Husted & Michailova, 2002), Social Loafing (Chidambaram & Tung, 2005), Knowledge Sharing Disengagement (Ford, 2008) and Partial Knowledge Sharing (Ford & Staples, 2010) are examples of CWBs.

Although KHi and KHo share important conceptual links and overlapping definitions (Serenko & Bontis, 2016), they have particular characteristics that distinguish them from each other. The former is more dysfunctional (Trusson et al., 2017), while the latter entails a less intentional form of concealment (Holten et al., 2016), because it does not seem to be motivated by an intention to disguise some requested knowledge (Webster et al., 2008). KHo refers to the concealment of unrequested knowledge, while KHi involves explicitly requested knowledge. The degree of intentionality and the request criterion are the main elements differentiating the two concepts (Serenko & Bontis, 2016). Furthermore, KHi and KHo are not considered the opposite of KS, because they have different antecedents (Connelly et al., 2012). In contrast to withholding knowledge by adopting hiding or hoarding initiatives, non-sharing may occur due to a lack of awareness among individuals regarding organisational demands or individual necessities.

People choose what knowledge to share, hide or hoard according to their interests, despite punishments, structured interactions, and social norms designed to stimulate KS practices (Connelly et al., 2012; Evans et al., 2015; Hislop, 2002; Steinel et al., 2010). Individuals could be hostile to voluntarily sharing what they know with co-workers (Husted & Michailova, 2002). They will resist helping others without receiving personal benefits (Tsui & Wang, 2008) and only engage in the sharing process when it suits their own interests (Mettler & Winter, 2016) or by reason of “anticipated gains in reputation and reciprocal benefits” (Rode, 2016, p. 1).

Often, there is no alignment between employee self-interest and organisational needs (Ross, 1973) and the pursuit of personal goals may even be unhelpful for the organisation (Evans et al., 2015). Those who retain knowledge are often looking to retain or acquire power, authority, influence or some kind of preferential treatment or favouritism (Muqadas et al., 2017). Such behaviour will thus negatively influence KS practices among co-workers.

According to Husted and Michailova (2002), several factors motivate members of an organisation to hoard their knowledge: protection of individual competence, conservation of time, fear of hosting knowledge parasites, avoidance of exposure, aversion to uncertainty, and compliance to hierarchy and formal power. At the same time, the ownership and control of knowledge constitute bargaining power due to the dependence of co-workers that require knowledge from specific

knowledge holders (Conger & Kanungo, 1988; Inkpen & Beamish, 1997).

People who hold required knowledge are important in the organisational context, and use their bargaining power to trade this hoarded knowledge for other resources or advantages which could be desirable to achieve work objectives and increase job performance (Evans et al., 2015). The importance of knowledge determines its sharedness, motivating the strategic behaviour of deciding whether to reveal or withhold what would benefit others (Steinel et al., 2010).

The interruption of knowledge flow can cause organisations to waste labour power and engage in the duplication of existing knowledge because employees believe they must independently acquire knowledge that is already available among co-workers (Serenko & Bontis, 2016). This failure to share knowledge could be derived from individual characteristics, such as a selfish attitude (Steinel et al., 2010) or contextual factors, such as a lack of time, appropriate channels for communication and unforeseen circumstances (Huo et al., 2016). At the same time, the accumulation of knowledge can result from impediments to sharing rather than personal intent, representing an interruption of information processing (Anaza & Nowlin, 2017).

Albeit destructive from an organisational perspective, knowledge retention is an intrinsically individual decision (Husted & Michailova, 2002). “The protection of individual competitive advantages is one such reason” (Husted et al., 2012, p. 756). Though it may be rational for individuals to engage in the pursuit of their own interests, it also undermines the firm’s objectives regarding KS, information flow, and organisational learning (Argote et al., 2003), and will create obstacles to knowledge management and the enhancement of collective performance (Faraj & Sproull, 2000).

3. Method

To achieve the research goal, a systematic literature review was conducted according to the steps proposed by Wolfswinkel et al. (2013, p. 47): “step 1 – define the criteria for inclusion/exclusion; identify the fields of research; determine the appropriate sources; decide on the specific search terms; step 2 – search articles; step 3 – refine the sample; step 4 – analyse using open, axial and selective coding; step 5 – represent and structure the content and structure the article”.

In step 1, the inclusion criteria were: 1) articles published until April 2018, when the data were collected; 2) scientific and peer reviewed articles; and 3) English language. The exclusion criteria were: 1) articles published in a language other than English; and 2) documents other than articles published in scientific journals.

Articles were selected from two databases, not limited to a particular research area: *Web of Science* and *Scopus*. These databases are generally considered credible among the scientific community, and are commonly used by researchers from a wide range of fields.

The articles were selected in a non-probabilistic and intentional way (Flick, 1998). The study is qualitative and exploratory in nature (Malhotra & Birks, 2007; Myers, 2013). Thus, in step 2, the articles that presented the search words “Knowledge Hiding” or “Knowledge Hoarding” in the title, abstract, or keywords were selected for further analysis: 41 documents from Web of Science and 50 from Scopus. After eliminating repeated papers in the step 3, a total of 57 articles were listed for the next stage. Figure 1 illustrates the distribution of these publications over time according to both databases, showing the predominance of papers published from 2013 to 2018 (considering only the first 4 months of the latter year). Hence, this bibliographic survey points to a growing interest in this theme.

In step 4, the selected papers were subjected to the Content Analysis technique, following the open and axial coding procedures according to Gibbs (2009). All 57 articles were examined in an attempt to assemble the meanings and definitions of KHi and KHo identified by each author, thus revealing any distinguishing trait, quality, or property, regardless of whether they were consistent or contradictory. These characteristics were identified in the fragments of texts where the

authors presented the concept, as an abstract idea or a general notion about the studied phenomena. The fragments that provided any kind of statement, explanation, or elucidation regarding KHi or KHo were highlighted and copied to a spreadsheet.

In step 5, according to these criteria, 97 fragments of text containing conceptual definitions were extracted from the sources and organised in a spreadsheet. The extracted data were conceptually organised in an attempt to ensure a degree of coherence by integrating attributes (Randolph, 2009).

No pre-defined codes were used, rather the content was freely codified, thus yielding the underlying characteristics of KHi and KHo. These emerged from the analysis of each fragment of text, when the most relevant idea was identified and linked to a nomenclature that contributes to the conceptual definition of the phenomena.

Each code juxtaposes ideas with the same semantic representation, that is imbued with an equivalent meaning. Similar or equivalent classifications were grouped in order to produce characteristics with a higher degree of abstraction, sharing the smallest number of equivalent meanings with other characteristics. Hence, the features that emerge from the coding are associated with one or both phenomena, considering the claims made in the previous literature. The reliability of the outcome from the analysis was enhanced, according to Krippendorff (1994), because the codification was carried out by two authors, and

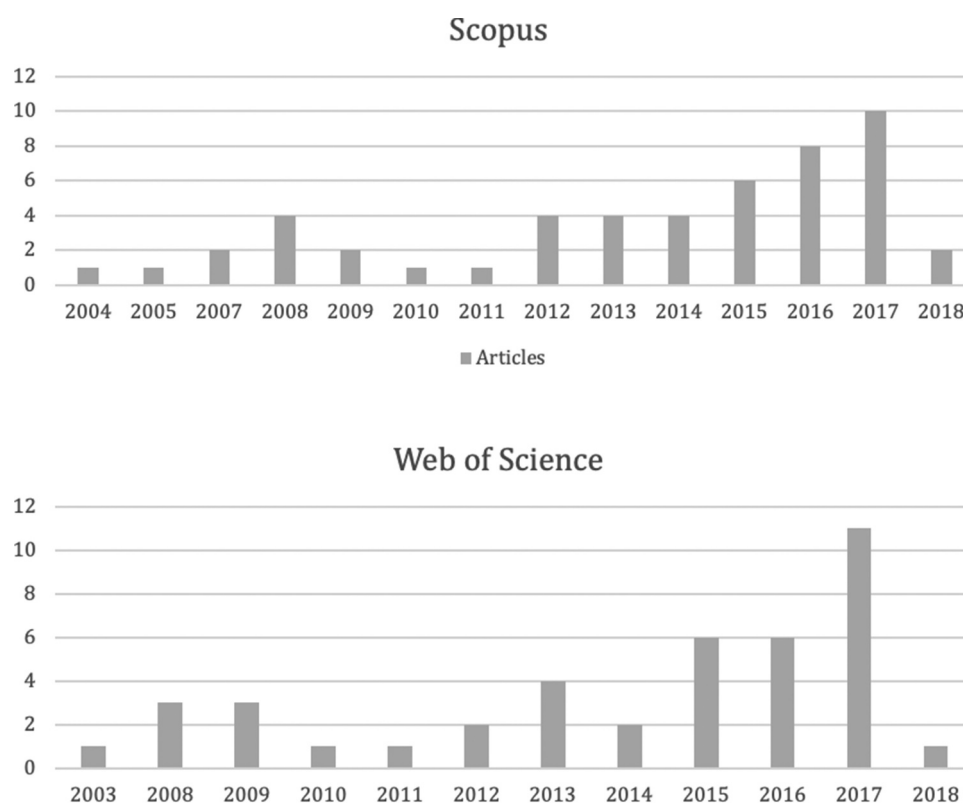


Figure 1. Articles published by year in both databases.

consensus was sought through discussion. The result of the review is presented in the next section.

4. Analysis

As a result of the analysis, 37 characteristics were initially identified for Knowledge Hiding and Knowledge Hoarding. These features were then refined and grouped into 17 characteristics that were divided among three tables, as presented below.

Table 1 shows the relationship between the codified characteristics and their authors for both concepts. The second shows the connections specifically related to KHi, while the third focuses on KHo. The sources that assign the respective underlying characteristic to the concepts studied in this paper are listed in columns labelled *Knowledge Hiding* and *Knowledge Hoarding*.

According to Table 1, concealing (characteristic 1) and withholding (characteristic 5) were repeatedly referenced in the definitions of KHi and KHo. The former refers to the intentional prevention of knowledge being shared, while the latter refers to an act of non-sharing or simple retention of what is known. In the context of KHi, concealing and withholding presuppose a non-sharing initiative (characteristic 3) and infer a higher degree of purposiveness.

Based on the features presented in Table 2, a dyadic relationship (characteristic 6) can be said to exist when a pair of individuals interact, and one of them seeks to suppress some knowledge that has been requested (characteristic 10) by the other (Bogilović et al., 2017;

Černe et al., 2017, 2014; Connelly & Zweig, 2015; Connelly et al., 2012; Fang, 2017; De Geofroy & Evans, 2017; Holten et al., 2016; Huo et al., 2016; Peng, 2013; Qureshi & Evans, 2015; Rhee & Choi, 2017; Serenko & Bontis, 2016; Zhao et al., 2016).

Knowledge Hiding and Knowledge Hoarding are not inevitably negative behaviours, such as aggression, social undermining or incivility, which are examples of Counterproductive Workplace Behaviours (Pearson et al., 2005). In that sense, acknowledging that people could hide knowledge without the intention to necessarily cause harm (characteristic 8), and considering that hoarding implies less intention to conceal and may have a self-benefit goal, neither one can be strictly defined as negative behaviours in the organisational context.

The study by Serenko and Bontis (2016) into the knowledge held by individuals presents the notion of ownership (characteristic 9), in which there is a conviction or belief regarding the exclusivity of rights over what is perceived to be personal property. According to this perspective, knowledge acquires the attributes of a territory (characteristic 11) that is maintained and protected by whoever owns and controls it. In that sense, hiding can preserve the special status of the individual who possesses knowledge that is valuable to and requested others, as he/she may be concerned that the disclosure of that knowledge might undermine their position (Fang, 2017).

Considering the characteristics of the KHo presented in Table 3, concealing is less intentional

Table 1. Underlying concepts of knowledge hiding and knowledge hoarding.

Characteristic	Knowledge Hiding	Knowledge Hoarding
(1) Concealing	(Bogilović et al., 2017; Černe et al., 2017; Černe et al., 2014; Connelly & Zweig, 2015; Connelly et al., 2012; De Geofroy & Evans, 2017; Fang, 2017; Huo et al., 2016; Peng, 2013; Qureshi & Evans, 2015; Rhee & Choi, 2017; Serenko & Bontis, 2016; Zhao et al., 2016)	(Evans et al., 2015; Serenko & Bontis, 2016; Zhao & Xia, 2017)
(2) Deliberate	(Connelly et al., 2012)	(Evans et al., 2015; Zhao & Xia, 2017)
(3) Not sharing	(Huo et al., 2016)	(Anaza & Nowlin, 2017; Ford et al., 2015)
(4) Protection	(Fang, 2017)	(Ford et al., 2015)
(5) Withholding	(Bogilović et al., 2017; Černe et al., 2017; Černe et al., 2014; Connelly & Zweig, 2015; Connelly et al., 2012; De Geofroy & Evans, 2017; Fang, 2017; Holten et al., 2016; Huo et al., 2016; Peng, 2013; Qureshi & Evans, 2015; Rhee & Choi, 2017; Serenko & Bontis, 2016; Zhao et al., 2016)	(Evans et al., 2015)

Table 2. Underlying concepts of knowledge hiding.

Characteristic	Knowledge Hiding
(6) Dyadic Relationship	(Connelly et al., 2012; Holten et al., 2016)
(7) Intentional	(Bogilović et al., 2017; Černe et al., 2017; Černe et al., 2014; Connelly & Zweig, 2015; Connelly et al., 2012; De Geofroy & Evans, 2017; Fang, 2017; Huo et al., 2016; Qureshi & Evans, 2015; Rhee & Choi, 2017; Serenko & Bontis, 2016; Zhao et al., 2016)
(8) Not (necessarily) intended to harm	(Connelly & Zweig, 2015; Connelly et al., 2012; Huo et al., 2016; Zhao et al., 2016)
(9) Ownership	(Serenko & Bontis, 2016)
(10) Requested	(Bogilović et al., 2017; Černe et al., 2017; Černe et al., 2014; Connelly & Zweig, 2015; Connelly et al., 2012; De Geofroy & Evans, 2017; Fang, 2017; Holten et al., 2016; Huo et al., 2016; Labafi, 2017; Qureshi & Evans, 2015; Rhee & Choi, 2017; Serenko & Bontis, 2016; Zhao et al., 2016; Zhao & Xia, 2017)
(11) Territoriality	(Serenko & Bontis, 2016)

Table 3. Underlying concepts of knowledge hoarding.

Characteristic	Knowledge Hoarding
(12) Accumulation	(Anaza & Nowlin, 2017; Connelly et al., 2012; De Geofroy & Evans, 2017; Qureshi & Evans, 2015; Serenko & Bontis, 2016; Zhao et al., 2016; Zhao & Xia, 2017)
(13) Less intentional form of concealment	(Anaza & Nowlin, 2017; Holten et al., 2016; Trusson et al., 2017)
(14) Not (necessarily) Requested	(Anaza & Nowlin, 2017; Connelly et al., 2012; De Geofroy & Evans, 2017; Holten et al., 2016; Qureshi & Evans, 2015; Zhao et al., 2016; Zhao & Xia, 2017)
(15) Power	(Khan & Khan, 2015; Muqadas et al., 2017; Trusson et al., 2017)
(16) Status Quo	(Khan & Khan, 2015)
(17) Strategic	(Evans et al., 2015; Zhao & Xia, 2017)

(characteristic 13) or purposeful as stated by Trusson et al. (2017), Holten et al. (2016), Anaza and Nowlin (2017), Evans et al. (2015), and Zhao and Xia (2017), beside being a deliberate or conscious act (characteristic 2), concealing is a strategic (characteristic 17) personal behaviour aimed at achieving specific goals, equivalent to having a planned and calculated objective. The intention could be to achieve power (characteristic 15), ensure protection (characteristic 4), maintain the status quo (characteristic 16), or obtain some kind of influence or benefits, such as a career promotion (Fang, 2017; Ford et al., 2015; Khan & Khan, 2015; Muqadas et al., 2017; Trusson et al., 2017).

One of the most important characteristics of KHo is the notion of accumulation (characteristic 12) and, as shown in Table 3, it is broadly cited across the reviewed articles. Connelly et al. (2012) refer to it as an act of acquiring an increasing quantity of knowledge. Qureshi and Evans (2015) link it with the notion of culture, which denotes a customary behaviour of accumulating and retaining knowledge that is not shared. The perspective presented by Serenko and Bontis (2016) highlights the deliberate nature of knowledge accumulation, when it is done consciously and intentionally.

Previous research has claimed that knowledge which is hoarded, even though relevant for individual, group or organisational performance, is not necessarily requested knowledge (characteristic 14) (Anaza & Nowlin, 2017; Connelly et al., 2012; De Geofroy & Evans, 2017; Holten et al., 2016; Qureshi & Evans, 2015; Zhao et al., 2016; Zhao & Xia, 2017). Furthermore, “it is knowledge that has not been requested by another individual” (Webster et al., 2008, p. 3). Thus, the condition of requisition is an indispensable premise, fundamentally present in the concept of KHi (Bogilović et al., 2017; Černe et al., 2017, 2014; Connelly & Zweig, 2015; Connelly et al., 2012; Fang, 2017; De Geofroy & Evans, 2017; Holten et al., 2016; Huo et al., 2016; Labafi, 2017; Qureshi & Evans, 2015; Rhee & Choi, 2017; Serenko & Bontis, 2016; Zhao et al., 2016; Zhao & Xia, 2017). The request criterion is not as important for the understanding of KHo behaviour as it is for KHi.

However, some authors believe KHo is strategic, and thus intentional as shown in characteristic number 7 in Table 2. That is because the knowledge holder is presumed to be attempting to ensure his/her power or protect the knowledge as an intangible asset (Evans et al., 2015; Fang, 2017; Ford et al., 2015; Khan & Khan, 2015; Muqadas et al., 2017; Trusson et al., 2017; Zhao & Xia, 2017). With more or less intentionality than is present in cases of KHi behaviour, the retention of unrequested knowledge (Webster et al., 2008) involves a different set of desired expected outcomes: on the one hand, to ensure personal protection or self-interest (Ford et al., 2015; Muqadas et al., 2017); on the other hand, to achieve some degree of political power and social influence among co-workers (Evans et al., 2015).

In a dyadic relationship, KHi presupposes a prior and explicit requisition of knowledge (Connelly et al., 2012), whereas KHo is independent of any previous request (Evans et al., 2015), and indeed there is no requisition (Webster et al., 2008). Additionally, KHo entails a lower degree of intentionality compared to KHi, since knowledge retention does not necessarily result from a previous social interaction among co-workers. Individuals do not always choose to communicate what they know (Ford et al., 2015), but instead retain and accumulate knowledge that could contribute to their personal and organisational performance.

Based on this analysis, it is possible to claim that the notion of a Knowledge Request (KR) differentiates KHi from KHo. The presence or the absence of a KR will define which type of knowledge withholding will occur. Although non-sharing will be a common outcome for both phenomena, KR determines the knowledge owner's decision to hide or hoard knowledge that should be shared.

5. The proposed framework

Assuming Knowledge Request to be a fundamental element that differentiates Knowledge Hiding and Knowledge Hoarding, it is possible to establish a relationship between these two undesired behaviours and Knowledge Sharing's underlying processes, specifically the concepts of Knowledge Collection and Knowledge Donation. When somebody asks to learn something, there is an explicit request for knowledge. At that moment, an individual hides what they know (Connelly et al., 2012), impeding KC despite the fact that consulting behaviour is often employed to encourage an individual to share what they know (Hooff & Ridder, 2004). When KHi happens after a KR, the outcome is a non-sharing behaviour, in which the requested knowledge is deliberately concealed.

It is common for people to have knowledge that could be important, useful or necessary for

a co-worker. It is also common for those who would benefit from this knowledge to be unaware of its utility, leading them to refrain from inquiring about knowledge that would improve their performance. Thus, KHo can be said to occur when unrequested knowledge is retained (Evans et al., 2015). The outcome is a non-sharing behaviour wherein the owner accumulates knowledge but does not disclose it.

The characteristics that have emerged from this review of literature on KHi and KHo lead one to consider the logical relationship between these undesirable behaviours and KS. While the degree of intentionality can be seen as a variable that can help determine whether the individual is hiding or hoarding, KR represents a crucial feature that distinguishes the two phenomena. When explicitly requested, knowledge can be shared or hidden. On the other hand, if not requested, it could be shared or hoarded.

Following this reasoning, when unrequested knowledge is hoarded instead of voluntarily shared, there is a non-donation act. For various reasons, an individual who possesses valuable knowledge may not supply it to somebody that could take advantage of it, even if they are unaware of that possibility. The absence of voluntary knowledge donation defines KHo, and an evident association between KHo and KD becomes apparent. In parallel, when knowledge is hidden instead of shared after an explicit request, there is a non-collection act. An attempt to persuade an individual to engage in KS will be impeded, revealing an association between KHi and KC. The collection initiative will not result in the sharing of what was requested.

Figure 2 presents these conceptual relationships in a framework that connects *sharing* and *requesting* as

variables that determine when hiding occurs and when hoarding occurs. There is an underlying assumption that the individual, group or organisation have some relevant knowledge which could or should be shared.

According to this proposed schema that articulates the inherent characteristics of KHi, KHo, KC, KD, individual number 1 owns some important or relevant knowledge that could benefit individual number 2. This knowledge could be requested or not, considering that the individual who needs the knowledge does not necessarily know who could supply it. Thus, in quadrant A, individual 2 requests some knowledge from individual 1 and does not receive the requested knowledge because, instead of sharing, individual 1 intentionally hides what they know, preventing KC. Quadrant B, by contrast, shows that individual 2 does not request any knowledge, although individual 1 possesses some knowledge that could benefit them. Instead of voluntarily sharing what they know, individual 1 prefers to hoard the knowledge, and this behaviour is represented by the dotted arrow in Figure 2. As a result, individual 1 prevents KD.

Quadrants C and D present the phenomena of KC and KD. In quadrant C, individual 2 asks for knowledge and individual 1 shares what was requested, making the KC process effective. Finally, in quadrant D, individual 1, acknowledging that his or her knowledge could benefit individual 2, voluntarily shares it, even though individual 2 had not requested the knowledge that was shared. In this case, individual 1's initiative makes KD effective.

This perspective about KS, KHo and KHi advances the model presented by Connelly et al. (2012, p. 66), where those behaviours related to

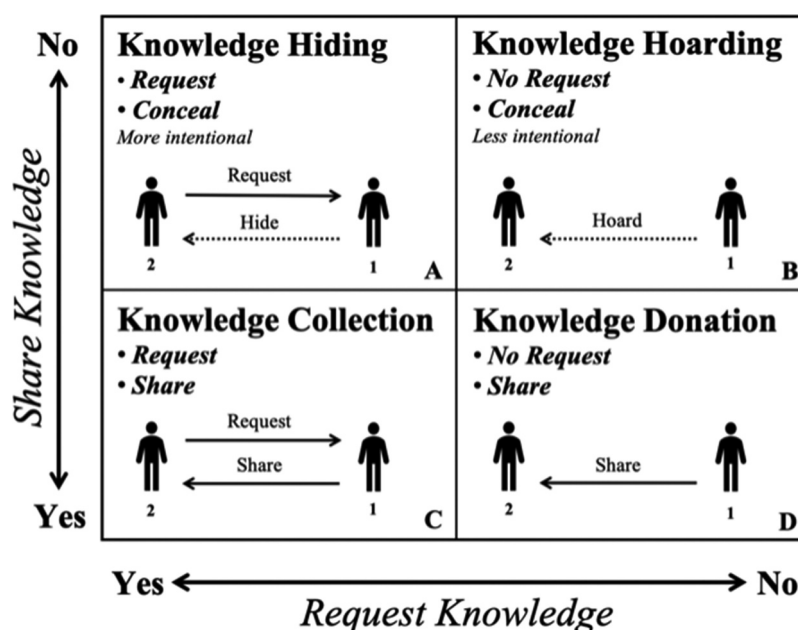


Figure 2. Knowledge hiding, hoarding, collection and donation framework.

knowledge flow are disconnected. By contrast, the proposed framework establishes conceptual links and delimits four behavioural scenarios illustrated in quadrant form (A, B, C and D). Each quadrant presents particular attributes, characterising the circumstances when knowledge is either shared or withheld in the context of social interactions. According to distinct and transitory situations that remain under-investigated, individual experiences can fit into a given quadrant that portrays predefined and aforementioned behaviours. Thus, a set of social aspects and workplace characteristics could influence someone's decision to share or withhold their knowledge from co-workers.

6. Future research directions

Based on the proposed framework, future research should consider Knowledge Collection, Knowledge Donation, Knowledge Hiding and Knowledge Hoarding to occur concurrently in the organisational context. These phenomena rely on under-explored factors that determine whether requested or unrequested knowledge will be shared. For example, personal motivations, different kinds of social interactions, hierarchy configurations, job types, project stages, methodological strategies, types of knowledge and workplace characteristics are some aspects that should be taken into account. This recommendation arises due to a notable gap in understanding regarding which social and contextual factors lead people to adopt the attitudes described in the four quadrants shown in Figure 2.

Scholars could then start exploring the antecedents, processes, outcomes and environments that should provide greater insights into the interconnectedness of KC, KD, KHi and KHo as human behaviours. Thus, further investigation is required to determine the motivations for sharing and non-sharing of knowledge from two perspectives: 1) level (individual, group and organisational), and 2) motivation type (intrinsic and extrinsic). Processes that encompass types of knowledge (tacit versus explicit, technological versus managerial), information technology (customised packages of tools to promote KC/KD and inhibit KHi/KHo), and social practices (initiatives to leverage one specific sharing or non-sharing behaviour) should also be considered. When making investments, organisations seek to enhance productivity and performance, for which knowledge is one of the most important prerequisites. Achieving those outcomes is critical in a competitive environment, where individuals and organisations are focused on developing capabilities and potentialities.

Finally, it is crucial to evaluate some environmental characteristics, such as project attributes (worker activity/role, project stage, methodology adopted), organisational attributes (hierarchy configurations,

culture, geographical distribution), organisation size (small, medium or large), inter-organisational relationship scope (within and among teams, departments or subsidiaries), inter-organisational relationship types (with competitors, partners or suppliers), and knowledge-intensive teams versus traditional teams. Figure 3 illustrates some recommendations regarding future research directions.

Several theories can assist the study of knowledge flow in the organisational context, by offering greater insights into the KC, KD, KHi and KHo phenomena. Social Capital Theory (SCT), for instance, explains the quality and level of the Knowledge Sharing process (Van Dijk et al., 2016). According to Nahapiet and Ghoshal (1998), social capital has three distinct dimensions: structural (connection patterns between actors), cognitive (shared representations, interpretations, and systems of meanings), and relational (types of personal relationships). These dimensions of social capital might motivate either desired or undesired KS behaviours among co-workers, thus promoting or hindering knowledge flow (Nahapiet & Ghoshal, 1998). Therefore, the characteristics of the social network will influence people's behaviour concerning the demand and supply of knowledge (Ardichvili et al., 2003).

The theory of Absorptive Capacity (Cohen & Levinthal, 1990) is another example of scholarship that could be usefully applied when investigating KC, KD, KHi and KHo. An effective use of shared knowledge will only occur when the recipient has sufficient knowledge to identify value in what is being shared, alongside the capacity to assimilate, transform and apply the shared knowledge in a given situation (Zahra & George, 2002). In a hypothetical situation, knowledge will not be shared when the recipient cannot understand and make use of that knowledge. For specific contextual reasons, knowledge will be concealed (KHi) or retained (KHo) because the receptor lacks sufficient absorptive capacity. The protection of sensitive or strategic knowledge from a market competitor or a desire to avoid wasting time and effort in a KD initiative could be examples that motivate non-sharing behaviour.

New studies should also consider two underlying assumptions: after a Knowledge Request, individuals could share and initiate Knowledge Collection or conceal their knowledge through KHi. On the other hand, when there is no KR, the knowledge owner could voluntarily share through Knowledge Donation, or strategically retain what they know through KHo.

Two other conceptual aspects must be taken into account: first, KHi does not represent the absence of KS due to conceptual differences and distinct motivations (Connelly et al., 2012). Second, KHo can have a paradoxical relationship to KS (Evans et al., 2015), as mechanisms designed to enable and encourage

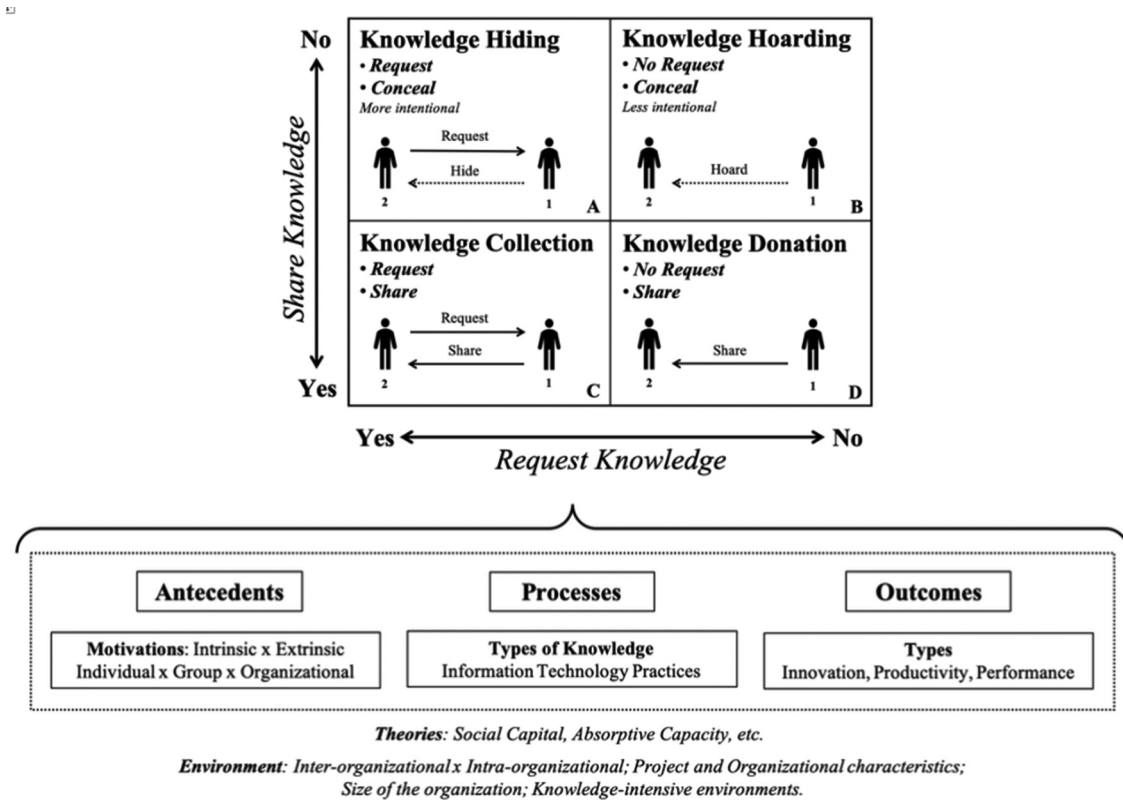


Figure 3. Approach for future research.

sharing practices could motivate people to be selective in what they share for strategic reasons.

Although KC and KD are usually classified as positive and desirable social behaviours, as opposed to KHi and KHo, in certain circumstances, KC, KD, KHi and KHo may be simultaneously positive or negative for organisations. Sharing is not always desirable, just as retention is not invariably undesirable (Connelly et al., 2012). On the one hand, the sharing of sensitive knowledge could be harmful when feelings, confidentiality, privacy, intellectual property, competitive advantages and other individual or group interests are not preserved. On the other hand, withholding knowledge may occasionally be employed as a means of protecting and benefiting people and their interests, resulting in positive rather than detrimental outcomes. Thus, scholars could investigate when each of these behaviours provides benefits or harm considering individual, team and organisational perspectives.

These gaps in our current understanding suggest exploratory research will be crucial to further develop this field of knowledge. A collection of empirical data related to knowledge workers would help determine whether and how personal, social and organisational variables might be related to sharing and non-sharing behaviours in social interactions. Future research about the social characteristics of knowledge-intensive environments should consider the causes and consequences of obstructions to knowledge flow, acknowledging that

KHi, KHo, KC and KD are crucial behavioural constructs in this area. Beyond their academic contributions, further exploration of these phenomena has the potential to optimise knowledge exchanges and, as a consequence, team and organisational performance.

7. Conclusions

Undesired behaviours in the context of knowledge flow among co-workers can undermine Knowledge Sharing initiatives, and consequently harm interpersonal and organisational performance. Knowledge Hiding and Knowledge Hoarding are social phenomena that hinder the flow of knowledge in social interactions. With or without a Knowledge Request, and a certain undetermined degree of intentionality, knowledge is concealed and retained by people who know something that is useful or necessary for the performance of others.

In the workplace environment, knowledge will be shared, hidden or hoarded among co-workers. After a KR, an individual could share knowledge that would benefit the requester. However, they could intentionally hide that knowledge and prevent Knowledge Collection from occurring. By contrast, in a situation where knowledge is not requested, the owner could voluntarily share that knowledge, to the benefit of co-workers or the organisation. Alternatively, they could

choose to ignore that possibility and retain what they know, preventing Knowledge Donation.

The manifestation of KHi denotes non-collection of the requested knowledge, revealing an association between that phenomenon and KC. Alternatively, KHo will prevent KD and the voluntary supply of knowledge, which explains the second association presented in this work. Hence, by articulating the characteristics of these sharing and non-sharing behaviours, it was possible to identify conceptual relationships among KHi, KHo, KC and KD that broaden our understanding of these phenomena.

Based on this new perspective, here a framework is proposed that illustrates how KHi, KHo, KC and KD are related considering the presence or absence of KS and KR among co-workers. Each quadrant presents particular attributes, characterising the circumstances in which knowledge is shared or not shared. Personal and contextual factors are likely to significantly influence engagement in KS, KHi or KHo behaviours and, therefore, need to be investigated, particularly in social interactions within and among knowledge-intensive teams. Future research could provide the academic community with a more profound understanding of the causes and consequences related to knowledge flow in social interactions within and among knowledge-intensive teams, thus ensuring access to the means to better manage the factors that benefit or harm individual, group and organisational performance.

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Disclosure statement

No potential conflict of interest was reported by the authors.

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