Impacts of knowledge sharing: a review and directions for future research

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Received 31 July 2018
Revised 8 January 2019
6 March 2019
Accepted 19 March 2019

Abstract

Purpose – Knowledge sharing contributes to the success of an organization in various ways. This paper aims to summarize the findings from past research on knowledge-sharing outcomes in organizations and to suggest promising directions for future research.

Design/methodology/approach – There was a conduction of a systematic literature review that consisted of three main phases: defining a review protocol, conducting the review and reporting the review. The thematic analysis was conducted on 61 studies, based on which a framework for understanding the impacts of knowledge sharing was developed.

Findings – Previous research has investigated knowledge-sharing outcomes at three levels: the individual, team and organization; specific impacts are summarized for each level. The most commonly studied factors affected by knowledge sharing are creativity, learning and performance. Knowledge sharing is also found to have some beyond-convention work-related impacts, such as those on team climate and employees' life satisfaction. Research on the outcomes of knowledge sharing is dominated by quantitative studies, as we found only one qualitative study in this review. Based on the discussion of the results, promising avenues for further research were identified and a research agenda was proposed. More research on differential, psychological and negative impacts, as well as interactional and methodological aspects of knowledge-sharing, is suggested.

Originality/value – To date, no systematic review has been conducted on the impacts of knowledge-sharing. This paper makes an important contribution to knowledge-sharing research, as it consolidates previous research and identifies a number of useful research topics that can be explored to advance the field, as well as to establish the evidence-based importance of knowledge sharing.

Keywords Knowledge management, Knowledge sharing, Knowledge-sharing review, Knowledge-sharing benefits, Knowledge-sharing outcomes, Knowledge-sharing effects, Systematic literature review

Paper type Literature review

1. Introduction

Knowledge sharing is one of the most fundamental activities in organizational operations. The strategic importance of knowledge is highlighted in a knowledge-based view of the firm (Nickerson and Zenger, 2004). Nevertheless, the mere existence of knowledge resources does not guarantee success (Hislop, 2013; Hussein *et al.*, 2016). To develop a sustainable, competitive advantage, organizational employees must share and apply knowledge in

This research has been funded by the Academy of Finland grant 295743 for the project "The Impact of Information Literacy in the Digital Workplace".

Journal of Workplace Learning
Vol. 31 No. 3, 2019
pp. 207-230

1366-5626
DOI 10.1108/JWL-07-2018-0096

practice (Cabrera and Cabrera, 2005; Dalkir, 2017; Nonaka *et al.*, 2000). Previous research has emphasized the benefits of knowledge sharing in the form of cost reduction, short product-development cycles, increased customer satisfaction and improved innovation and performance capabilities (Ozer and Vogel, 2015; Wang and Noe, 2010).

In the past couple of decades, research on different aspects of knowledge sharing has been increasing. One of the most important purposes of knowledge management is to systematically influence knowledge exchange, application and creation, thereby creating value (Kozhakhmet and Nazri, 2017; Li *et al.*, 2009). Consequently, success of knowledge-management policies in an organization hinges on the knowledge sharing between employees and its resulting outcomes (Hislop, 2013). Owing to the complexity of knowledge sharing, which is influenced by many individual, organizational and contextual factors, a major research focus has been on the identification of factors that inhibit or support it (Mahnke *et al.*, 2009). Consequently, one of the criticisms of knowledge-sharing research is that it focuses too much on knowledge-sharing enablers, such as technology, organizational culture and rewards and pays comparatively less attention to the value realization of knowledge sharing (Henttonen *et al.*, 2016).

Since the turn of the decade, interest in knowledge-sharing outcomes has surged. A number of empirical studies have been conducted on the effects of knowledge sharing. This stream of research has played an important role in establishing the value of knowledge management, which skeptics once thought of as no more than a passing fad (Wilson, 2002). Moreover, it has provided concrete evidence of the benefits that individuals and organizations can obtain from their involvement and investment in knowledge sharing. However, much remains to be learned and understood about the value of knowledge sharing in organizations.

The specific purpose of this paper is to summarize the findings from past research on knowledge-sharing outcomes in organizations and to suggest promising directions for future research. This paper contributes to our understanding of knowledge-sharing impacts in several ways. First, the field has been growing and, to the best of our knowledge, no systematic review has been conducted on the impacts of knowledge sharing, to date. In contrast, a number of review papers have been published on precursors of knowledge sharing, providing a strong evidence-based understanding of knowledge-sharing antecedents (Haq and Anwar, 2016; Ipe, 2003; Wang and Noe, 2010). By consolidating previous findings, this review will help in building an evidence-based body of research on knowledge-sharing outcomes. Second, existing research seems fragmented. Knowledge-sharing outcomes have been investigated in fields such as information systems, strategic management, human resource management and psychology. The present review synthesizes the current fragmented literature and provides an organizing framework based on it. Third, as the first review on the theme, it reveals the most researched topics thus far, which will help in avoiding possible repetitions while directing attention to areas of inquiry on which research is most needed.

In this review, knowledge sharing is defined as the exchange of task-related information, advice and expertise to help others and to collaborate with others to carry out daily tasks, solve problems and develop new ideas (Ahmad, 2017). The impact of knowledge sharing refers to work-related implications and changes brought up by knowledge-sharing activities of employees in an organization. We specifically focus on interpersonal knowledge sharing, that is, knowledge sharing between individuals face-to-face or via online communication media, such as Skype and e-mail.

2. Methodology

The present literature review followed the guidelines advanced by Kitchenham (2004). Consequently, the literature review consisted of three main phases: defining a review protocol, conducting the review and reporting the review. The defined review protocol was composed of the following elements:

- inclusion and exclusion criteria;
- search strategy;
- data source;
- study selection;
- data extraction; and
- data analysis and synthesis.

2.1 Inclusion/exclusion criteria

The inclusion and exclusion criteria aim to identify studies that provide direct evidence about the research question (Kitchenham, 2004). In this study, inclusion and exclusion criteria consist of four aspects. First, we include all such studies in our review that investigate the antecedent role of knowledge sharing, whether positive or negative, with regard to other factors in organizations. Second, because research on knowledge sharing is interdisciplinary, the literature review is not limited to a specific discipline. Third, this review paper focuses on interpersonal knowledge sharing, which means the unit of analysis in this paper is the impact of individual-level knowledge sharing. It is not viable to analyze knowledge sharing across teams, departments, subsidiaries, organizations and industries in one review paper. This criterion also excludes studies on knowledge transfer that has been mostly used to describe the "movement of knowledge between different units, divisions, or organizations rather than individuals" (Wang and Noe, 2010, p. 117). Fourth, only empirical studies are included in the literature review. Moreover, editorials and book reviews are excluded, as they do not include original research.

2.2 Search strategy

We used eight search terms – *impact of knowledge sharing*, *benefits of knowledge sharing*, *role of knowledge sharing*, *effects of knowledge sharing*, *influence of knowledge sharing*, *knowledge-sharing consequences*, *knowledge-sharing outcomes* and *knowledge-sharing implications* – to find published papers studying the impacts of knowledge sharing. We also made a more focused search by adding commonly known impacts of knowledge sharing, such as performance, innovation, learning and creativity, to the search terms to retrieve studies that may have been missed in the first round.

2.3 Data source

The search terms were used to collect related studies from EBSCOhost, a database that provides access to publications in a variety of fields. Moreover, it allows using complex search strings and filters, which makes it easy to apply complex selection criteria. Therefore, it is considered a suitable choice for systematic literature reviews (Wang and Noe, 2010). To ensure inclusion of all relevant studies in our literature-review analysis, we also searched for relevant studies in major digital libraries, such as ScienceDirect, Wiley, Springer, Sage and Google Scholar. We did not use any time period restriction and included studies published in English only.

2.4 Study selection

The initial search generated a result of 2,061 articles. We read the title and the abstract of each article. We removed all duplicates, which considerably reduced the sample size. Then, we applied the selection criteria: the study must be empirical, published in a peer-reviewed journal and focused on knowledge sharing within organizations. Consequently, 105 articles were retained. We found 22 other articles after a more focused search on knowledge-sharing impacts as described in the search strategy section (Section 2.2). Overall, we had 127 articles for full text review. After thorough reading of the articles, we removed another 78, mainly because of irrelevance to our topic of interest or lack of quality. Reading the studies and their references, we found 12 more articles relevant to our objective. In the end, our final sample was composed of 61 studies. The literature-selection process is described in Figure 1.

2.5 Data extraction

A data-extraction form was created to retrieve information on demographics, research design and knowledge-sharing impacts. Both authors divided the articles among themselves and read each article one by one. The extracted information was stored in an Excel spreadsheet.

2.6 Data analysis and synthesis

For data synthetization and analysis, we divided the data into two categories. The first category contained information regarding demographic and methodological attributes. It was quantitatively analyzed, producing descriptive results, presented in Section 3.1. The second category contained text extracted directly from previous studies about the nature of the impacts analyzed, explanation of the impacts and key points of the study. As suggested by Zahedi *et al.* (2016), the thematic analysis technique developed by Braun and Clarke (2006), was used to systematically analyze the data in the second category. The six-step process of thematic analysis is outlined below:

(1) *Familiarization with the data*: Initially, familiarization with the data was developed by reading the papers selected for review. To further delve into the data, we used the "repeated reading" approach to search for meanings and patterns (Braun and Clarke, 2006). To remove any ambiguity, the extracted data were connected to the source paper to develop contextual understanding helpful in data interpretation.

(2) *Generating initial codes*: While identifying the key points in the extracted data, appropriate codes were assigned. The coding process was research-question-driven, i.e. we developed codes capturing different aspects of the impacts of knowledge sharing, such as type of impact, nature of impact and level of impact. The studies were elaborative in terms of outlining and defining the knowledge-sharing impacts under investigation, which made it easier to assign relevant codes.

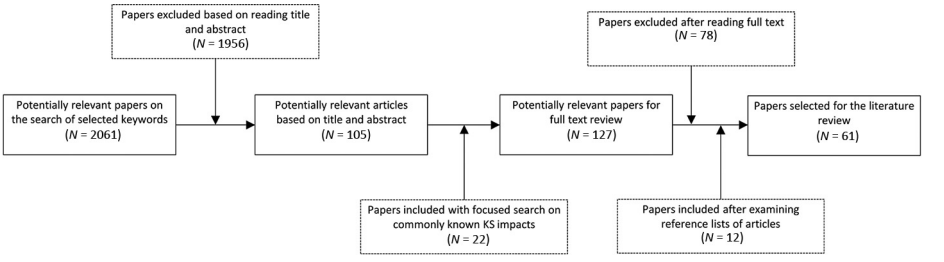

Figure 1.
Study-selection process

(3) *Generating themes*: After the completion of the coding process, all codes were reviewed and collated to generate potential themes relevant to the research question. For example, codes, problem-solving and work efficiency were clustered under theme performance. As suggested by Braun and Clarke (2006), a visual representation of codes, elaborating connections among codes and potential themes was created. Clustering helped to create the main themes.

(4) *Reviewing themes*: All of the themes were defined and common characteristics in the themes were outlined, which led to the development of higher-level themes composed of many sub-themes. For example, the level of impact was a common thread connecting different themes, which led to the development of main themes, for example, individual-level impact, composed of individual performance, individual learning and creativity and individual psychological effects. Overall, this process resulted in the identification of knowledge-sharing impacts explored in previous studies and potential research gaps, needing further investigation.

(5) *Producing the written analysis*: Our analysis reveals knowledge-sharing impacts at the individual, team and organizational levels, as presented in Section 3.2.

3. Findings

3.1 Descriptive findings

The systematic search and analysis of the papers show that the number of empirical studies investigating knowledge-sharing impacts and outcomes has increased over time. Figure 2 depicts the growth in literature on knowledge-sharing impacts. Overall, 76 per cent of the studies were published after 2010, which shows that the impacts of knowledge sharing have attracted the most attention in the past seven years.

The studies were published in peer-reviewed journals in different fields. As shown in Figure 3, most of the studies were published in organizational management (around 50 per cent), followed by knowledge management and psychology. We found one qualitative and 60 quantitative studies. To ensure that the absence of qualitative studies in our sample was not because of our search strategy, we reran our search query, including the terms *interviews*, *qualitative study*, *case study* and *observations*. Nevertheless, we did not find any new relevant studies. We determined the research methodology according to what was stated in the paper.

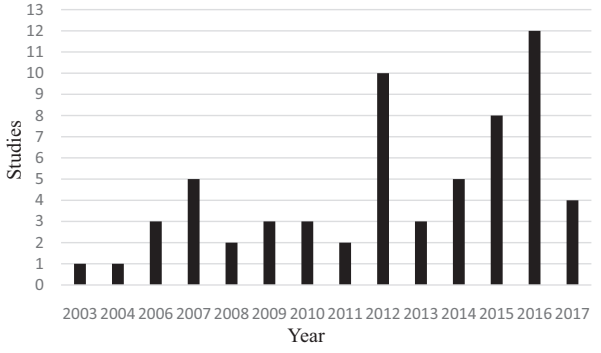

Figure 2.
Growth of the empirical studies on knowledge-sharing impacts in 2002-2017

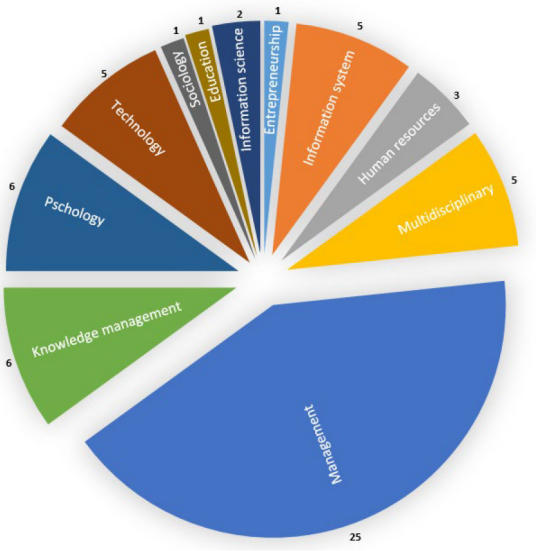

Figure 3.
Distribution of studies based on types of fields

3.2 Impacts of knowledge sharing

This section reports the findings regarding key impacts of knowledge sharing found in empirical research. Table I provides an overview of the key effects of knowledge sharing.

3.2.1 Individual-level impact. At the individual level, knowledge sharing has three types of impact. It influences individual performance, learning and creativity and has psychological effects.

3.2.1.1 Individual performance. The empirical evidence suggests a positive effect of knowledge sharing on employee performance. The most common finding is that the use of collective know-how and expert opinion enabled by knowledge sharing enhances efficiency in task accomplishment, problem-solving and decision-making, which further leads to improved employee performance (Kang *et al.*, 2008; Masa'deh *et al.*, 2016; Reychav and Weisberg, 2009; Zhu, 2016).

Nevertheless, the notion that knowledge sharing enhances performance is not ubiquitous. Previous research shows that many contextual factors can influence performance outcomes of knowledge sharing. For example, an abusive supervision style and lack of management support can reduce the positive impact of knowledge sharing on employee performance (Kim and Yun, 2015; Ozer and Vogel, 2015; Park *et al.*, 2015). Hostile behavior limits self-regulation resources, impairing employees' knowledge absorption and application capacity (Tepper, 2007). Beyond contextual conditions, personal characteristics, such as level of education (Henttonen, 2016), self-efficacy (Kim and Yun, 2015) and personal aspiration – i.e. setting difficult goals for oneself – (Quigley *et al.*, 2007) affect whether, and to what extent, employees experience improvement in performance because of knowledge sharing.

Chow (2012) examined the knowledge sharing–performance relationship in the context of individuals' network position and concluded that the performance benefits of knowledge sharing do not vary with network position of knowledge-sharing participants. This is against expectations, as network theory suggests that central positions are advantageous in

Impact level	Impact type	Key impacts	Nature of impact	Empirical studies (examples)
Individual	Performance	Task-accomplishment efficiency	Positive	Masa'deh, Obeidat, and Tarhini, 2016
		Problem-solving efficiency	Positive	Kang, Kim and Chang, 2008
	Learning and creativity	Innovative work behavior	Positive	Radaelli *et al.*, 2014
		Creative fluency and originality	Positive	Carmeli *et al.*, 2013
		Knowledge creation	Positive	Park *et al.*, 2014
		Realized absorptive capacity	Positive	Kang and Lee, 2017
	Psychological effects	Job satisfaction	Positive	Zhu, 2016
		Life satisfaction	Positive	Jiang and Hu (2016)
		Intention to leave	Negative	Reychav and Weisberg, 2009
Team	Performance	Work efficiency	Positive	Liu *et al.*, 2011
		Sales performance	Positive	Song *et al.*, 2015
		Problem-solving	Positive	Cummings, 2004
	Creativity	Creative solution and novel ideas	Positive	Cheung *et al.*, 2016; Kessel *et al.*, 2012
		Absorptive capacity	Positive	Lee, Lee and Park, 2014
	Climate	Trust	Positive	Alsharo, Gregg & Ramirez, 2017
		Socialization	Positive	Radaelli *et al.*, 2014
		Attitude toward diversity	Positive	Lauring & Selmer, 2011
Organization	Performance	Financial performance (revenue and return on investment)	Positive	Collins & Smith, 2006; Wang & Wang, 2012
		New product performance	Positive	MacCurtain *et al.*, 2010
	Learning and innovation	Ideation capability	Positive	Sáenz *et al.*, 2012
		Organizational absorptive capacity	Positive	Kumar and Che Rose (2012); Liao *et al.*, 2007
		Entrepreneurial orientation and corporate entrepreneurship	Positive	De Clercq *et al.*, 2015; Mustafa *et al.*, 2016
	Business process efficiency	Strategic alignment of business processes	Positive	Pai (2006); Kearns & Lederer, 2003
		Project-management capability	Positive	Lee *et al.*, 2016; Sáenz *et al.*, 2012
		Process improvement (error prevention, process standardization and documentation)	Positive	Law & Ngai, 2008
		Organizational effectiveness	Positive	Noor *et al.*, 2015

Table I.
Key effects of knowledge sharing in empirical studies

terms of time, range, access and referral and, therefore, central individuals should enjoy better performance outcomes than peripheral individuals (Burt, 1992).

3.2.1.2 Individual learning and creativity. When employees engage in knowledge sharing, they elaborate and externalize their knowledge (Ahmad and Widén, 2018). Many studies have found that knowledge sharing enhances *innovative work behavior* (Hu and Zhao, 2016), *knowledge creation* (Hu *et al.*, 2009; Iqbal *et al.*, 2015; Ma *et al.*, 2013; Park *et al.*, 2014), *creative fluency* (frequency of ideas) and *creative originality* (highly original ideas)

(Carmeli *et al.*, 2013), leading to effective learning and creativity (Mura *et al.*, 2016: Zhu, 2016). As engagement in mutual discussion and exchange of ideas improve one's capability to make sense of things, knowledge sharing has also been found to enhance employees' *absorptive capacity* (Kang and Lee, 2017).

Some studies show that reciprocity and individual diversity are extremely critical in the relationship between knowledge sharing and learning and creativity (Radaelli *et al.*, 2014). One-sided knowledge sharing means exiguous discussion and feedback, which is not sufficient for creativity that flourishes with interactive dialogue. Similarly, homogeneity among knowledge-sharing participants is detrimental to learning and creativity. Employees exhibit more creativity when exposed to a range of perspectives and out-of-the-box thinking, enabled by individuals with dissimilar rather than similar backgrounds (Huang *et al.*, 2014). Overall, reciprocity and individual diversity are the only contextual factors whose role in knowledge sharing and learning relationship has been empirically investigated.

3.2.1.3 Individual psychological effects. In our review, only three studies examine the relationship between knowledge sharing and psychological aspects. As a major source of personal professional development, knowledge sharing enhances autonomy, skills utilization and self-fulfillment. Based on a study of R&D engineers, Zhu (2016) indicates that active knowledge sharing improves *job satisfaction* among employees. While drawing on social exchange and social determination theory, Jiang and Hu (2016) showed that knowledge sharing enhances employees' *life satisfaction*, as it fosters quality relationships, buffers work-related stress and ameliorates work–life conflict. Another psychological aspect closely related to work and life satisfaction is *intention to leave*. Reychav and Weisberg (2009) showed that employees' intention to change jobs decreases with tacit and increases with explicit knowledge sharing. Nevertheless, if explicit knowledge sharing is rewarded monetarily, intention to leave the organization diminishes. As compared to tacit, explicit knowledge sharing contributes less to personal development. Therefore, employees engaging in extensive, explicit knowledge sharing find it difficult to recognize learning opportunities and hence consider alternative job options.

3.2.2 Team-level impact. Knowledge sharing also has team-level consequences. Review of the literature shows that knowledge sharing influences team performance, creativity and climate.

3.2.2.1 Team performance. Teams are essential elements of modern organizational work arrangements. Therefore, many studies have analyzed the impact of knowledge sharing on team performance (Henttonen *et al.*, 2013; Huang, 2009; Srivastava *et al.*, 2006). According to Liu *et al.* (2011), knowledge sharing between team members develops a transactive memory system that enhances *work efficiency*. Their study of R&D project teams showed that those teams that engage regularly in knowledge sharing are better equipped to deal with project-related challenges and obstacles and consequently perform better. In the Korean context, a study by Song *et al.* (2015) shows a positive relationship between teams' *sales performance* and knowledge-sharing intensity. Cummings (2004) showed that structural diversity on a team enriches knowledge sharing by exposing the team to different sources of information and know-how, which consequently generates better performance measured in terms of effective *problem-solving*. Nevertheless, Haas and Hansen (2007), in their study on management teams, note that lack of effort to adjust the complexity of knowledge according to the expert status of the individuals involved can reduce the positive impact of knowledge sharing on team performance. As knowledge customization improves understanding, it ensures knowledge application in novel ways (Choi *et al.*, 2010).

3.2.2.2 Team creativity. Teams in organizations perform many heuristic tasks, without readily identifiable paths to task accomplishment (Kessel *et al.*, 2012). Knowledge sharing

among team members has been found to be an important element of team creativity and learning. Previous research shows that knowledge sharing improves teams' *idea generation* and *absorptive capacity*, which spur team creativity. In a longitudinal study, Cheung *et al.* (2016) showed that novel ideas emanate from knowledge sharing because it enables discussion of the feasibility of creative solutions. Furthermore, Lee *et al.* (2014) noted that knowledge sharing between team members builds a mental model of who knows what, known as absorptive capacity, which is a critical component in team creativity.

In previous research, two contextual conditions, project complexity and instability of the environment have been found to play an important role in the knowledge sharing and creativity relationship. A study by Wang *et al.* (2012) shows that for teams operating in dynamic environments, sharing task-centric knowledge, relevant to immediate problems and work-related issues is more important for the development of the team's capability to come up with creative solutions and ideas than sharing human-centric knowledge, relevant to interpersonal issues and team objectives. Overall, empirical research on the impacts of knowledge sharing on team creativity is very limited.

3.2.2.3 Team climate. Knowledge sharing influences social climate in teams. Knowledge sharing is known to induce interaction and reciprocation, providing a platform for team *socialization* (Radaelli *et al.*, 2014) and instilling *trust* among team members (Alsharo *et al.*, 2017). This also has consequences for team climate. The findings of a study by Flinchbaugh *et al.* (2016) confirm that intensive knowledge sharing between team members develops a positive perception of overall team collaboration climate, characterized by enhanced service quality and satisfaction.

Knowledge sharing has also been found to develop a positive attitude toward diversity in heterogeneous teams. In a Danish study, Lauring and Selmer (2011) found that knowledge sharing drives interaction between employees, which promotes openness to linguistic, visual and informational diversity. In other words, knowledge sharing builds a positive *diversity climate* in teams and in departments.

3.2.3 Organizational-level impact. Organizational-level implications of knowledge sharing are the most studied topic in the literature on knowledge-sharing impacts. At the organizational level, knowledge sharing between employees influences organizational performance, learning and business process efficiency.

3.2.3.1 Organizational performance. Many studies have investigated the impact of knowledge sharing on organizational performance (Gomes *et al.*, 2017; MacCurtain *et al.*, 2010, Noor *et al.*, 2015; Oyemomi *et al.*, 2016; Rezaei *et al.*, 2017; Wang and Wang, 2012).

Knowledge sharing improves organizational (financial) performance in terms of profitability, market share, return on investment and sales growth (Collins and Smith, 2006; Gomes *et al.*, 2017; Rezaei *et al.*, 2017). Wang and Wang (2012) confirmed that tacit knowledge sharing enhances both *financial* and operational performance; however, explicit knowledge sharing contributes to financial performance only. Nevertheless, knowledge sharing must be in alignment with internal organizational processes to achieve positive performance outcomes (Oyemomi *et al.*, 2016).

Most knowledge-sharing research has been conducted in the context of middle- and low-level management. Although rarely researched, top-management knowledge sharing is critical for organizational performance. MacCurtain *et al.* (2010) investigated the performance outcomes of knowledge sharing between top-management employees. They showed that an organization's *new product performance* is a direct function of knowledge sharing in top management. As organizational top management has a holistic view of industrial dynamics and organizational capabilities, knowledge sharing in upper

management can result in timely interventions, leading to high organizational performance in the market.

3.2.3.2 Organizational learning and innovation. Previous empirical research shows that knowledge sharing among employees supports organizational *innovation and ideation capability*, *absorptive capacity* and *entrepreneurial orientation (*Kumar and Che Rose (2012).

Lin (2007) showed that knowledge sharing, whether it is being received or provided, is valuable as it erodes knowledge stickiness and sets in motion knowledge combination and reorientation processes and leads to sustained organizational innovativeness. Wang and Wang (2012) further confirm that knowledge sharing enhances not only the quality but also the pace of learning and innovation in organizations.

Knowledge sharing is critical to the development of *organizational absorptive capacity*, as it supports a continuous leveraging of existing knowledge to build innovative new knowledge (Khan *et al.*, 2015; Liao *et al.*, 2007; Iqbal *et al.*, 2015; Yang, 2007. According to Wang *et al.* (2016), knowledge sharing improves organizational learning capability and thus supports knowledge embeddedness in routines and procedures and exploitation of knowledge in relationships with stakeholders.

Knowledge sharing develops *entrepreneurial orientation* in the organization. De Clercq *et al.* (2015) found a positive relationship between knowledge sharing and organizational entrepreneurship in SMEs. Intensive knowledge sharing enables organizations to develop knowledge that can be used to create new ideas, engage in experimentation, compare alternative decisions and build innovations. Mustafa *et al.* (2016) also confirmed a positive relationship between knowledge sharing and organizations' entrepreneurial activities.

3.2.3.3 Business process efficiency. A desired outcome of knowledge sharing is the improvement of internal organizational practices and processes, which are considered essential for long-term organizational survival (Harmon and Trends, 2010). Therefore, previous research has empirically examined the influence of knowledge sharing on *strategic alignment, project management capability* and *process development*.

Pai (2006) found that knowledge sharing not only improves the quality of IT strategic planning processes but also leads to the alignment of information system and business strategies, thus leading to increased efficiency in organizational operations. Kearns and Lederer (2003) also confirmed these findings in a study on knowledge-sharing behavior of chief information officers (CIOs) and chief executive officers (CEOs). Knowledge-sharing activities of CIOs and CEOs create alignment in IT and business planning processes and contribute to the development of process refinement and implementation efficiency.

Knowledge has also been found to improve organizations' project-management competence. For example, in the context of software projects, knowledge sharing reduces cycle time (Lee *et al.*, 2016; Sáenz *et al.*, 2012) and optimizes deployment of information systems (Shao *et al.*, 2012).

Some studies have elaborated on the relationship between knowledge sharing and *business process development* (Chang *et al.*, 2012). Law and Ngai (2008) noted that knowledge sharing supports process standardization, process simplification, coordination of activities and responsiveness in service offerings. Noor *et al.* (2015) investigated knowledge-sharing impact in the NGO context and found that knowledge sharing improves internal effectiveness by instilling clarity in project processes and activities. Overall, knowledge sharing improves business process efficiency in a number of ways.

4. Emerging issues and future research directions

The previous section discussed the impacts of knowledge sharing as investigated in previous research. While identifying the research gaps, the following discussion outlines

emerging issues and future research directions, with a particular focus on interactional, negative, differential, psychological and methodological concerns in knowledge-sharing impact research.

4.1 Knowledge-sharing impacts from the interaction and process perspective

Knowledge sharing is a complex process that encompasses more than the simple communication of knowledge (Ahmad, 2017). The characteristics of individuals, teams and organizations can shape the commitment, conditions and environment of knowledge-sharing processes and, consequently, their outcomes. A few studies have explored the role of external factors in knowledge-sharing outcomes. Nevertheless, the interactive potential of individual, team and organizational characteristics remains to be explored.

4.1.1 Individual dispositions. Dispositional characteristics represent the uniqueness of individuals and explain the way they tend to think and behave (Kalat, 2013). In the performance of work, individual traits are activated as suggested in the trait activation theory (Tett *et al.*, 2013). Because productive knowledge sharing requires some creative conflict and tension (Skilton and Dooley, 2010), variance in individuals' agreeableness traits can influence the quality of knowledge-sharing outcomes, such as creativity, learning and problem-solving. Similarly, activation of highly neurotic traits during complex problem-solving discussions can result in fear and anxiety, lowering individuals' capacity to articulate and comprehend knowledge during knowledge sharing, thereby impeding the achievement of desired outcomes.

Another important individual disposition is sense of coherence. Having a high sense of coherence means an individual can make sense of things around him/her, show strong resilience, focus on the positive aspects of a situation and make appropriate decisions (Antonovsky, 1993; Nielsen *et al.*, 2008), all of which play an integral role in the success of knowledge-sharing interactions and their outcomes. This is an interesting area that has not been investigated before.

The dispositional perspective could be particularly useful in explaining nuances in a direct relationship between knowledge sharing and individual cognitive capacity, suggested in previous studies (Carmeli *et al.*, 2013). For example, employees with positive dispositions will focus on positive aspects and hence will use self-evaluations and cross-validation triggered through knowledge sharing as opportunity for further learning. Nevertheless, the relationship may reverse if knowledge-sharing participants possess highly negative personal dispositions, such as negative effectivity. Therefore, future research should pay close attention to individual dispositional characteristics in the investigation of knowledge-sharing impacts.

4.1.2 Team characteristics. In our literature review, only one study (Wang *et al.*, 2012) investigated the role of team characteristics and team climate stability in knowledge sharing outcomes. Teams, like individuals, possess certain characteristics that are important in the knowledge-sharing-outcome transformation process.

4.1.2.1 Work interdependence. Work interdependence is considered a defining characteristic of teams and has been widely studied in the teamwork literature (Campion *et al.*, 1996; Somech *et al.*, 2009), but not in relation to knowledge sharing outcomes. The performance of teams characterized by high task-interdependence relies on the equal and mutual contribution of team members (Campion *et al.*, 1996), which means that not only the amount but also the diversity of the knowledge being shared will matter for performance outcomes. Moreover, the performance and creativity outcomes of knowledge sharing can vary with teams' work-interdependence levels. Teams with high task-interdependence can better use knowledge sharing, as the achievement of their goals is dependent on the

collection and integration of diverse ideas. This may not be the case in low-task-interdependence teams, in which individuals may not clearly identify the relevance and benefits of the knowledge being shared and hence lean on their own expertise for decision-making or problem-solving. Consequently, knowledge sharing may not result in enhanced creativity.

4.1.2.2 Hierarchal diversity. Hierarchal diversity in teams is also an important characteristic. Strong hierarchical differences can generate congruent behavior and dictate whose opinions are actualized (Cantimur *et al.*, 2016), which means that even extensive knowledge sharing may not necessarily result in the best decisions. When power dynamics come into action, convergence on opinions and assessment of alternative views are nuanced (LePine *et al.*, 1997), thereby influencing knowledge-sharing outcomes. This proposition is plausible in high power distance cultures. Cross-cultural management research shows that in high power distance contexts, subordinates show less strength in defending their arguments and are more accommodative of their superiors' views out of respect (Hofstede *et al.*, 2010). Although previous research has analyzed the role of diversity, for example, structural diversity, in knowledge sharing outcomes (Cummings, 2004), future research should pay attention to hierarchical diversity in teams and how it can influence knowledge-sharing outcomes.

4.1.3 Organizational structural characteristics. More research is needed to help us understand the role of organizational characteristics in knowledge-sharing outcomes. Organizational structure and environmental turbulence can influence knowledge-sharing outcomes. Previous research shows that organizational survival in highly turbulent environments depends on persistent knowledge sharing enabling responsive decision-making (Keszey, 2018). However, organizational structures, in which the decision-making power rests with a few individuals, experience a sharing–acting gap (Zheng *et al.*, 2010), thereby undermining the benefits of knowledge sharing. We already know, as shown by Wang *et al.* (2012), that environmental dynamism influences the outcomes of knowledge sharing. Therefore, the relationship between organizational structure and knowledge-sharing outcomes is intuitive and requires further empirical exploration in future research.

4.2 Negative impacts of knowledge sharing

Our review shows that previous research has mostly found positive impacts of knowledge sharing. Nevertheless, as pointed out by Mahnke *et al.* (2009), knowledge sharing is not always good. Along with benefits, it involves costs for the parties involved.

4.2.1 Repeated collaborations. Previous research has shown that knowledge sharing is mostly a voluntary but demanding activity that requires time, commitment of cognitive resources and engagement (Ahmad, 2017; Cabrera and Cabrera, 2005). Individuals can end up sharing extensive amounts of knowledge, even for minor tasks, owing to pervasive knowledge sharing norms. Too much knowledge sharing can lead to redundancy and cognitive costs (Foss *et al.*, 2010). Research on mental models on teams has questioned the potential benefits of knowledge sharing, particularly when individuals engage in repeated collaborations (Haas and Hansen, 2005; Mohammed and Dumville, 2001; Skilton and Dooley, 2010). Extensive knowledge sharing in repeated collaborations can stagnate creative abrasion and team creativity over time by establishing rigid mental models, i.e. accepting views without overt discussion, evaluation and criticism, owing to pre-established trust acquired in past collaborations. Therefore, team members' collaboration history and repetition should be considered in future research on the impacts of knowledge sharing.

4.2.2 Cognitive stress. There is also evidence that knowledge sharing among highly differentiated individuals may not generate positive performance outcomes (Dahlin *et al.*,

2005; Huang *et al.*, 2014). When disparities between individuals' cognitive mental models and professional expertise are great, development of even a basic level of understanding can result in cognitive exhaustion. This can result in negative health outcomes in the form of stress. Social–psychology literature shows that work engagements with diverse individuals can trigger stress, as individuals try to comprehend differences and solve communication problems and misunderstandings. As knowledge sharing is an interaction-intensive activity, it can lead to stress and burnout, particularly when it is enforced by managements' expectations and evaluations. The relationship between stress and work behaviors has been established in previous research (Colligan and Higgins, 2006; Henle and Blanchard, 2008); however, stress implications of knowledge sharing, which is an important and cognitive-intensive activity, have not been empirically analyzed thus far.

4.2.3 Time cost. Most interpersonal knowledge sharing in organizations takes place informally (Dalkir, 2017), which is beneficial, as it allows dealing with unanticipated problems. Nevertheless, knowledge sharing can also drain the time and resources available for other work activities, leading to work overload (Szulanski, 1996; Wang and Noe, 2010). When additional benefits are marginal, time invested on knowledge sharing beyond a certain point can inflict performance penalty. In addition, this situation is further aggravated by the perception of knowledge sharing as an extra-role activity (Cheng and Coyte, 2014). The time-waste consequence of knowledge sharing has been recognized (Ahmad, 2017; Haas and Hansen, 2007); nevertheless, it requires further empirical investigation.

4.2.4 Workplace politics. Individuals engage in knowledge sharing with good intentions – a conception widely held in knowledge-sharing research. Organizational politics theory suggests that political motivations, which may not necessarily be good, can influence work behavior (Chang *et al.*, 2009; Miller *et al.*, 2008). Employees are known to strategically adjust their behavior to maximize their self-interest (Vigoda, 2002). Knowledge sharing has not been studied through the lens of workplace politics theory, even though knowledge is known as a source of power. It is highly plausible that employees can intentionally share knowledge that may not be beneficial for the accomplishment of a task. They can hold back their personal expertise for professional gains while pretending to be active knowledge sharers. Similarly, some individuals can engage in free-riding knowledge sharing by trying to benefit from the expertise of others while making little contributions themselves, leading to a public good dilemma (Cabrera and Cabrera, 2005). Such a type of knowledge sharing can intensify workplace politics and result in negative outcomes, such as negative feelings among employees, a tense work environment and hampered performance. Future research should explore the negative impacts of knowledge sharing, for example, on employee relationships and work climate, using the organizational politics theory.

Overall, a critical perspective is needed to comprehend the potential drawbacks of knowledge sharing. Research on the negative outcomes of knowledge sharing can enrich our understanding of its net impacts, particularly of when and how drawbacks outweigh benefits.

4.3 Differential impacts of knowledge sharing

Knowledge sharing represents a combination of some form of knowledge and a sharing activity or mechanism. Characteristics of knowledge and channel used for knowledge sharing can result in varying outcomes (Dalkir, 2017).

4.3.1 Knowledge types. The type of knowledge shared for a specific task can influence the achievement of individual and organizational goals. Previous studies on knowledge-sharing impacts have mostly conceptualized knowledge sharing as a whole. Research on the

differential impacts of sharing various types of knowledge is not only scarce but also contradictory. For example, Kessel *et al.* (2012) noted a positive impact of explicit knowledge sharing on innovativeness, whereas Reychav *et al.* (2012) found a negative one. Reychav *et al.* (2012) also showed that explicit knowledge sharing enhances employees' intention to leave the organization, whereas tacit knowledge sharing reduces it. Future research should further explore the differential impacts of different forms of knowledge sharing, as different forms of knowledge can have different outcomes.

4.3.2 Knowledge relevance. Explicit knowledge sharing in the form of instructions and protocol can be useful to perform standard tasks, such as software testing and maintenance and problem-solving. Sharing tacit knowledge can help comprehend complex problems and develop new solutions (Reychav and Weisberg, 2009). However, for time efficiency and rapid responsiveness, sharing explicit knowledge could be more useful than sharing tacit knowledge. For example, the development of a new solution through tacit knowledge sharing will be less efficient and productive compared to sharing an already existing solution that has been designed to solve a similar problem. This shows that, for certain tasks, relevance rather than the nature of the knowledge could be more critical for the efficient accomplishment of tasks. Future research should pay close attention to what is being shared during knowledge sharing and how it feeds into outcomes.

4.3.3 Knowledge sending vs receiving. While some studies conceptualize knowledge sharing as encompassing both sending and receiving, others do not make this difference and focus only on knowledge flow, regardless of direction (Kim and Yun, 2015; Law and Ngai, 2008). It would be difficult to differentiate between sending and receiving knowledge in interactive discussions; nevertheless, one's usual status as sender or receiver in the organization can influence knowledge-sharing outcomes at the individual level. For example, continuous knowledge sending can be helpful in establishing one's status as an expert, but continuous receiving can be more useful in enhancing learning potential and absorptive capacity. It would be interesting to explore how individuals' general role during knowledge sharing, for example, in team discussions, can lead to differential individual- and team-level outcomes.

4.3.4 Knowledge-sharing media. Interpersonal knowledge sharing occurs face-to-face and via communication technologies such as e-mail and Skype. In our review, we did not find any studies exploring the potential variation in the outcomes of knowledge sharing through different channels. This is an important question, as technology-mediated knowledge sharing has become a common characteristic of today's workplaces. Ubiquitous access and flexibility offered by virtual communication channels enhance individuals' knowledge-processing capability (Barley *et al.*, 2011) and control, leading to better knowledge-sharing outcomes. Nevertheless, technology-mediated knowledge sharing has its disadvantages. For example, Ahmad (2017) found that diversity-driven misunderstandings increase in technology-mediated knowledge sharing. Consideration of the synchronous or asynchronous nature of knowledge-sharing outcomes is also important. Real-time interactive discussion allows capitalizing on dialectical and contextualization cues and helps in the verbalization of complex cognitive thoughts, which is important for knowledge-sharing quality (Ahmad, 2017). Previous research has shown that email, one of the most commonly used online tools for knowledge sharing, is a source of distraction from work because of its asynchrony, which allows people to send and receive e-mail anytime (Barley *et al.*, 2011). Technology has inherent differential characteristics that make technology-mediated communication experiences different from face-to-face ones (Alsharo *et al.*, 2017). Future research should explore how technology-mediated knowledge sharing contrasts with

face-to-face knowledge sharing in terms of outcomes and achievement of individual, team and organizational goals.

4.4 Psychological impacts of knowledge sharing

Work practices have psychological effects (Lee *et al.*, 2010), and knowledge sharing is no exception to this. Indeed, it is plausible that emotional consequences of individual knowledge sharing will be more blatant than those of many other work behaviors because of the crucial importance of knowledge sharing for performance and career advancement. In our review, we found only three studies that explored the psychological impacts of knowledge sharing – life satisfaction, job satisfaction and turnover intention. On the one hand, this confirms that knowledge sharing has psychological impacts and, on the other, it exposes the lack of research in this area and signals future research directions.

Future research should examine the impact of knowledge sharing on organization-based self-esteem, i.e. the belief about one's organizational worthiness (Gardner and Pierce, 2016). Knowledge sharing is a mechanism to contribute to organizational success. As individuals put their expertise into action through knowledge sharing, they consciously or unconsciously evaluate organizational dependence on their professional expertise (Mukahi, 2016). Therefore, an impact of knowledge sharing on organization-based self-esteem is highly likely. Nevertheless, this relationship could have certain nuances, in that individuals may weigh knowledge contribution more than acquisition on their personal assessment of organizational worthiness.

Knowledge sharing could significantly influence stress. This relationship has been discussed under the negative impacts of knowledge sharing. Nevertheless, some other related psychological aspects, such as job security, person–job fit and job autonomy provide a fertile ground for future research on knowledge-sharing impacts.

4.5 Methodological issues

4.5.1 Qualitative research. Knowledge-sharing research has been mostly quantitative thus far. In one of the most comprehensive reviews of antecedents of knowledge sharing, Wang and Noe (2010) found only a small number of qualitative studies. In our review, we found only one qualitative study on knowledge-sharing outcomes, that of Oyemomi *et al.* (2016).

This lack of qualitative research is an important gap in research on knowledge-sharing outcomes. The potential reason for this gap is the sensitive nature of knowledge and temporal aspects of "impact," which makes it difficult to secure permission to openly discuss knowledge-sharing activities and to analyze their impacts that usually unfold over time. Moreover, knowledge sharing is a collaborative process, which means a valid assessment of its benefits require access to all relevant parties involved in the knowledge-sharing process. Nevertheless, with all these challenges comes along the opportunity to address the depictions of "realities that cannot be reduced to a few variables" (Rynes and Gephart, 2004, 455). Because of the lack of qualitative research, we are largely unaware of emergent processes that entail a transformation of knowledge sharing into potential outputs. For example, how knowledge-sharing interactions evolve during a problem-solving episode, what types of linguistic patterns are depicted, and how language- and communication-related aspects of knowledge sharing influence potential outcomes, are such questions that have not been addressed so far (Ahmad, 2018). Why certain knowledge-sharing interactions fail and generate required output while others do not, is still largely unknown. A limited understanding of procedural, contextual and experiential aspects of the knowledge-sharing process can be clearly attributed to a lack of qualitative research. Investigation into knowledge-sharing interactions through observations and interviews can help understand

how hidden, nevertheless important, elements of knowledge-sharing discussion, such as conflict resolution, advocacy and convergence/divergence, define knowledge sharing outcomes.

4.5.2 Context-sensitive scale. Knowledge sharing is often measured through standard questionnaires in the form of willingness, attitude and frequency of knowledge sharing. Although research generalizability is enhanced, standard measures face the risk of incongruence with knowledge-sharing contexts and practices (DeVellis, 2016). Objectivity of measures can be improved by developing more situation-specific ones, as done by Hu *et al.* (2009). Refining focus by attending to nuances, such as timeliness of knowledge sharing, facets or types of knowledge and the quality of it, can help develop good knowledge-sharing measures that provide a better understanding of its outcomes.

4.5.3 Longitudinal research design. Longitudinal research designs are needed to understand the dynamic processes of knowledge-sharing impacts. Cross-sectional designs can show direct relationships; nevertheless, causal direction and development of events can be better analyzed through repeated data collection (Flinchbaugh *et al.*, 2016). An important benefit of longitudinal research designs would be the possibility to analyze the reciprocal impacts of knowledge sharing on its antecedents. The factors that influence knowledge sharing over time are themselves influenced by it, and consequently they again influence knowledge sharing, triggering a feedback loop. For example, impression management is a strong motivation for sharing knowledge (Gagné, 2009). Previous research has shown that individuals share knowledge to attain expert status and positive supervisor appraisals. However, if knowledge sharing results are not in alignment with motivations, individuals may withdraw from sharing activities. The same reciprocal relationship exists between organizational socialization and knowledge sharing. To unravel such dynamics, longitudinal designs with repeated surveys, observations or interviews may be of great value.

4.5.4 Multilevel analysis. A multilevel analysis of knowledge-sharing outcomes is required in future studies. Knowledge sharing is a multilevel phenomenon that operates across boundaries and is nested within different layers of the organization. Multilevel analysis of the antecedents of knowledge sharing has been conducted before (Quigley *et al.*, 2007); nevertheless, the multilevel impacts of knowledge sharing remain to be explored. It is possible that knowledge sharing can improve individual but not team performance or vice versa. Furthermore, employees can be tactical in knowledge sharing as they can focus on exchanging expertise and know-how to the extent that is helpful in achieving their personal rather than team goals. Multilevel analysis can be helpful in exploring the conditions and mechanisms necessary to relay and realize the value of knowledge sharing from one level to another.

5. Conclusion and implications

Knowledge sharing is an integral part of knowledge management, which, in turn, plays an important role in the efficient accomplishment of organizational goals. In this paper, we conducted a systematic literature review to develop a comprehensive understanding of knowledge-sharing outcomes. Based on our literature review, we propose a theoretical framework (Figure 4) for research pertaining to knowledge sharing impacts. It offers an overview of the current state of the field and identifies emerging theoretical and methodological issues as discussed in the previous sections.

Overall, we can summarize four important findings from this review. First, our review shows that the impact of knowledge sharing is holistic and can be broken down into three categories: individual, team and organizational. It shows that not only the organization but

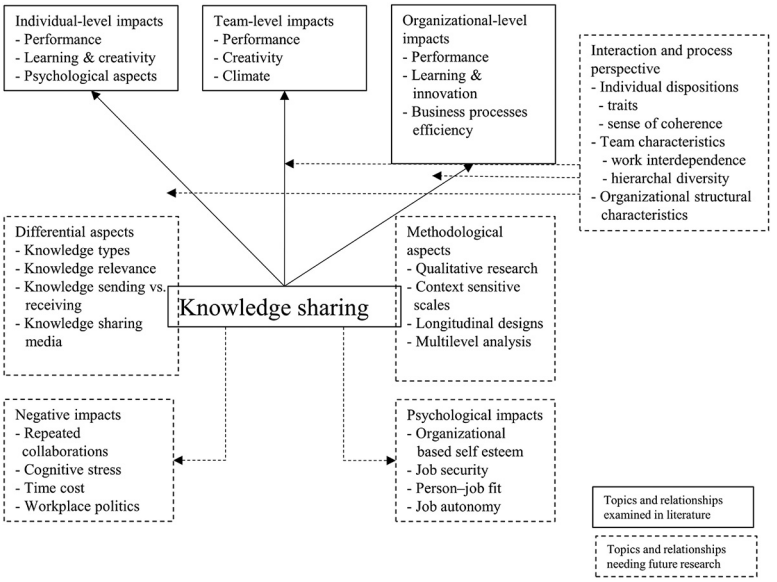

Figure 4.
A framework for knowledge-sharing impact research

also individuals gain from engaging in knowledge sharing. Second, the most commonly studied factors influenced by knowledge sharing are creativity, learning and performance. Third, knowledge sharing has some beyond convention work-related impacts. For example, it contributes positively to team climate. As an interaction-intensive activity, it enhances socialization, builds trust, encourages reciprocity and helps in the realization and appreciation of diversity. Moreover, it improves job and life satisfaction, although the evidence is limited and needs further investigation. Fourth, research on knowledge sharing impacts is dominated by quantitative studies, as we found only one qualitative study in this review. Overall, this review shows that knowledge sharing is an important organizational activity and its potential impacts cut across all organizational levels.

Although previous research has offered considerable evidence on the benefits that can be gained from knowledge sharing, more work needs to be done. We identify five research areas that need to be explored in future research. First, research on knowledge-sharing impacts should adopt an interaction and process perspective. In particular, we emphasize the importance of individual-, team- and organizational-level characteristics. Such characteristics represent the unique traits and, thus, can determine how and what is achieved through knowledge sharing. Second, we propose that a critical perspective be taken to broaden our understanding of the net impacts of knowledge sharing, with a particular focus on its drawbacks. This review shows that previous research has tended to focus on the positive aspects of knowledge sharing. Although beneficial overall, knowledge sharing can have unintended impacts as well. For example, as a cognitive-intensive activity, knowledge sharing can lead to stress, particularly when diversity among individuals is high and convergence is difficult to achieve. Third, the differential impacts of knowledge sharing should be further investigated. Knowledge sharing has many constituents; it involves different types of knowledge, as well as interaction media. Tacit and explicit knowledge sharing, technology-mediated knowledge sharing and face-to-face knowledge sharing, as well as knowledge sending and receiving, are inherently different and can result in varying

impacts. Fourth, we suggest that the psychological effects of knowledge sharing should be further explored. Knowledge sharing is a social behavior, thus intuitively connected with psychological and social consequences. Fifth, methodological improvements are suggested to better understand the impacts of knowledge sharing. Qualitative research is needed to understand processes such as knowledge sharing interaction, which conditions the influence of knowledge sharing. Moreover, longitudinal research design, which is a natural choice for developing an in-depth understanding of effect processes, needs to be operationalized in future research.

There are some practical implications that we can draw from consistent findings in the existing literature on knowledge-sharing impacts. First, knowledge-sharing activities have positive psychological impacts. Employees experience not only high job satisfaction and strong commitment to the organization but also life satisfaction. Consequently, knowledge sharing should be systematically embedded into organizations' employee well-being program. Moreover, organizations should design a knowledge-management evaluation system, such that, in addition to performance and innovation, effectiveness of knowledge sharing should be evaluated in terms of employee experiences and emotions related to knowledge-sharing activities. Second, research has shown that knowledge sharing is beneficial at all levels – individual, team and organization. Consequently, organizations can adjust their strategies aimed at motivating employees to engage in knowledge sharing. For example, in highly individualistic cultures, individual level benefits can be advertised to encourage knowledge-sharing activities in organizations. Third, many previous studies have established that knowledge sharing strongly promotes corporate entrepreneurship. Consequently, organizations, which aim to leverage current assets to develop new businesses and enter new markets, should strongly promote knowledge sharing.

This article makes an important contribution to knowledge-sharing research. This review consolidates previous research and identifies a number of useful research topics that can be explored to advance the field, as well as establish the evidence-based significance of knowledge sharing. Moreover, it is a timely contribution, as it responds to recent calls for more research on knowledge-sharing impacts (Henttonen *et al.*, 2016).

Note

1. * References marked with an asterisk indicate empirical studies included in the review.

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