Do different genders' knowledge sharing behaviors drive different innovative behavior? The moderating effect of social capital

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Abstract

Purpose – Considering the importance of innovation in organizations and the formation of innovative behaviors (IBs) in the life of the organization, the authors study the effect of moderating social capital (SC) and gender in the link between knowledge sharing (KS), including sharing best practices and sharing mistakes with IB.

Design/methodology/approach – In this research, a random sampling method was used. A questionnaire was completed by 310 employees working in five prestigious companies in the energy sector located in Mashhad province, Iran.

Findings – The findings of the research indicate the influence of KS on IB. Also, SC moderates the effect of KS on IB. However, the moderating effect of gender was not significant, sharing best practices more likely to lead IB in women. Moreover, the men are more likely to show IB as they share their mistakes in comparison with women.

Originality/value – This research aims to break the black box on the link between employee KS and his/her own innovativeness, which is not frequently investigated. To the authors' best knowledge, there is a lack of deep empirical study that has delved into analyzing the impact of gender-groups and SC on this relation.

Keywords Sharing mistakes, Innovative behavior, Social capital, Knowledge sharing, Knowledge management

Paper type Research paper

1. Introduction

To cope with global competition and environmental uncertainty, innovation is considered as a strategic solution for organizations (Omri, 2015). Individual-level innovation is important for the continuous success of any organizations (Shalley *et al.*, 2004). Knowledge sharing (KS) behavior is one of the antecedents of innovative behavior (IB) at an individual level (Abukhait *et al.*, 2019; Anser *et al.*, 2020). However, the previous research provides strong contribution to show the impact of KS on other employees' IB (Hassan *et al.*, 2018; Akram *et al.*, 2020). But there is not sufficient empirical evidence in the literature showing the impact of KS behavior on sharer IB and the moderator effect of social capital (SC) in this relation. Moreover, the potential difference between gender-groups is not considered in the link between KS and IB in previous research. So, to fill this gap the present study aims to explore how different genders' KS behavior anticipate their own IB and whether different levels of SC matter.

The high level of employees' IB at the workplace is dependent on the process of ideas creation, promotion and implementation of new ideas to deal with work-related problems (Janssen, 2000). Thus, to be superior in innovation, manufacturing organizations tend to

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improve the knowledge, skills and abilities of their employees (Dong *et al.*, 2017; Raymond and St-Pierre, 2010; Shin *et al.*, 2016; Anser *et al.*, 2020; Zawawi *et al.*, 2011). So, KS is recognized as an important factor in organizational competitiveness and success, therefore, the lack of KS probably impedes organizational survival (Lin, 2007). Organizations that provoke KS tend to increase innovations (Akram *et al.*, 2020), provide opportunity for innovators to acquire information and encourage them to delve into organizational external and internal knowledge (Radaelli *et al.*, 2014). We consider two type of KS including best practices sharing and sharing mistakes. Previous studies mostly have examined the effect of staff KS on the IB of those receive the knowledge; including coworkers (Usmanova *et al.*, 2020), group members (Vandavasi *et al.*, 2020) or firms (MacCurtain *et al.*, 2010; Hussein *et al.*, 2016). However, one aspect that past research has seldom investigated is whether sharing best practices and sharing mistakes may influence the knowledge, more specifically, whether employees who exchange knowledge are higher innovation-prone (Mura *et al.*, 2013; Radaelli *et al.*, 2014). However, much of previous research on knowledge management has driven from qualitative surveys which investigated some knowledge-resources dynamics, and empirical confirmation of this relationship is still unclear. In previous studies, the effect of the sharing best practices and sharing mistakes on a sharer own IB remains unexplained and unclear. Moreover, there are the lack of empirical studies investigating the gender differences in IBs and their antecedents (Abukhait *et al.*, 2019), so, we aim to explore the mediator role of gender-groups in the effect of KS and sharing mistakes on the IBs. Furthermore, another key moderator is SC which has not been sufficiently investigated.

Previously the energy sector was based on fossil fuels, providing huge pressure and criticism that has led to change in both energy generation processes and energy distribution, while simultaneously, changing customers into smart energy users (Pamuła, 2017). However, in Iran, the process of changing starts with some entrepreneurs providing new technologies for households and manufactures aiming to reduce the fossil fuels (gas) and the usage of energy. There are limited studies in the field of KS and IB in this leading sector (e.g. Cervigon and Romero, 2008; Pamula, 2017; Karatas and Macovei, 2010; Bointner, 2014; Nyga-Łukaszewska, 2016). So, we aim to investigate the effect of KS on the IB at five energy sector companies in Mashhad city, Iran.

The current study provides new insights into IB by filling several important gaps. Firstly, the study proposes a theoretical model that investigates the relationship between a staff's KS behavior and his/her IB, in an individual level. Accordingly, we considered two diverse forms of KS among staff members, including sharing good professional practices as well as sharing flaws and mistakes. Secondly, this study tests two of the most important moderators, which have not been investigated sufficiently in the literature, including gender-groups and SC. Thus, the objectives of this study are to empirically explain: whether KS influences sharers IB positively and whether SC and gender-groups moderate this relationship in the energy sector.

2. Theoretical basics and research background

2.1 Innovative behavior (IB)

IB can be defined as the personal capability to generate original and useful ideas as well as applying those new ideas into practice (Birdi *et al.*, 2016). Researchers consider IB as the quality of figuring out problems, creating new and creative ideas, seeking for support and approval, and finally implementing them (Zhao *et al.*, 2011). Moreover, IB in a workplace refers to an intentional creation, promotion and application of novel ideas (Yuan and Woodman, 2010). Idea generation mean developing novel ideas (Radaeli *et al.*, 2014) and may contain all circumstances that intended for refinement of new goods/services and process (Akram *et al.*, 2020). In idea promoting, an employee has an IB that seeks to attract the support and confirmation of others for his/her innovative ideas and is eager for managers to accept

innovative ideas (Mura *et al.*, 2013). The implementation of the idea refers to more practical efforts to transform the new ideas into practical solutions and implement them in organizational work including proposing a prototype or a pattern of the idea (De Jong and Den Hartog, 2010; Mura *et al.*, 2013; Radaeli *et al.*, 2014).

2.2 Knowledge sharing (KS) and innovative behavior (IB)

Continuous innovation has become very important for development of any organizations. Consequently, companies are greatly fascinated about recognizing factors which probably influence IB in a workplace (Agarwal, 2014) including KS. Knowledge is the main source of organizations for sustained performance when faced with industrial and technological changes (Nonaka, 1991). One of the key factors in knowledge management is the ability of organizations to transfer and share knowledge. Different definitions of KS are provided. KS refers to activities through which knowledge is transferred or exchanged in different forms from one person, group or organization to another (McAdam *et al.*, 2012). Therefore, KS is the transfer of activity, the competitive organization and the distribution of knowledge from a person, group or organization to another person, group or organization (Hsiao and Chang, 2011). Compared to the effects and changes that are important in the transfer of knowledge, KS is more concentrated on the process of collecting and disseminating and helping to exchange knowledge, deploying, building and ultimately, the knowledge-based ability of the organization (Wang and Wang, 2012). We consider KS in its two aspects, including sharing best practices and mistake sharing.

Errors, despite being unfavorable, always provide an opportunity for organizational learning and thus provide an incentive for innovation (Van Dyck *et al.*, 2005). A worker who has a sharing mistakes style, shares his/her work mistakes with colleagues and has no negative attitude to doing so. These staff members also share their learned lessons from their work mistakes in discussion sessions and through informal interactions and communication with their colleagues (Mura *et al.*, 2013).

The process of KS is related to sharing individual and organizational knowledge (Kakhki *et al.*, 2020). So, both employees and organizations can benefit from the advantages of KS (Lin, 2007; Kakhki *et al.*, 2020). One of the potential effects of KS is innovation at the organizational and individual level. Based on the study by Alhady *et al.* (2011), the companies that motivates its staff members for sharing knowledge is more likely to generate novel ideas at an individual level and provide new business opportunities and organizational innovation. Related to previous studies (Abukhait *et al.*, 2019; Akram *et al.*, 2020), the present survey proposed that KS influences on workers' IB positively. This relation support by social exchange theory (SET) (Blau, 1964). SET propose that a staff who have accessibility to intellectual properties may return the favor by being innovative. Employees who attend to innovative work behavior must constantly manage knowledge, and specifically expand, combine, translate and distribute tacit knowledge (Nonaka, 1991; Quintane *et al.*, 2011). According to SET, by transferring more knowledge, an individual provides a feeling of obligation in the knowledge receiver to exchange (Akram *et al.*, 2020; Watson and Hewett, 2006). Consequently, staff members who show more KS behavior tend to be reciprocated by receiving novel solutions and support from other employees – and consequently have a greater chance to show more IB (Radaelli *et al.*, 2014). So, the process of KS makes employees involved to engage in IB including idea generation and idea promotion. Idea creation is a process of idea generation which integrates knowledge from inside and outside of the organization into new ideas (Popadiuk and Choo, 2006). At idea promotion stage, employees translate new ideas into a form that is clear and acceptable for others (Caniëls *et al.*, 2014) to gain their support. At implementation idea, individuals intricate, integrate, convert and implement new idea with the help of others (Hansen *et al.*, 2005). Accordingly, individuals who share their knowledge, indirectly, promote their capability to be innovative.

Elaborating, integrating and translating information enables them to arrange knowledge into new ideas, promote ideas and gain support from other employees, as well as apply them into normalized activities, services, products or process (Radaeli *et al.*, 2014).

H1. Employees' KS (best practices) influences on IB positively.

KS can also have considered throughout sharing errors and mistakes with other employees. Accordingly, the employees' share their mistakes, which leads to losing time, producing defective products and accidents. These can lead to innovation and learning not only for recipients but also for mistake sharers (Mura *et al.*, 2013). The process of the learning from mistakes is considered as the key characteristics of innovative firms (Cannon and Edmondson, 2001). In this regard, Mura *et al.* (2013) showed that mistake sharing influences IB of the mistake sharer, because sharing mistakes leads to create new ideas in the minds of mistake sharer with the aim of preventing reoccurrence of the mistakes. According to SET, sharing of working mistakes can be considered as a pro-social activity (Chow *et al.*, 2000), since it tries to hinder other employees from making the similar errors. Like sharing good experiences, it is predicted who receive sharing behaviors (sharing mistakes) tends to reciprocate by motivate sharer for greater engagement to create, promote and implement the novel idea. In this regard, scholars have stated conflicting arguments. On one hand, some researchers have shown that a shared mistake is less likely to be detected by the receiver as a valuable thing which is exchanged, which may be apply against sharer (e.g. Husted and Michailova, 2002; Mura *et al.*, 2013), leading sharing mistakes as a component which have not any effect on IB. On the other hand, others believe that the process of sharing mistakes can motivate learning by providing the social relations wherein employees reciprocally engage in problem-solving process (Teigland and Washo, 2003). According to previous arguments, we proposed this hypothesis:

H2. Employees' sharing mistakes influence their IB positively.

2.3 Social capital (SC) and gender as moderators

The term SC was first used by the American Teacher, Hannifen in (1916) to explain the changes that were observed in student social relationships. And later it was developed by scientists such as Bourdieu, Coleman and Putnam (Jin *et al.*, 2017). SC is the sum of potential and actual resources that result from the ownership of the network with the continuity of institutionalized relationships between individuals and, more simply, membership in a group (Lang and Ramírez, 2017). Putnam also states that SC is a characteristics of social interactions, such as networks and rules that empower stakeholders to work with each other more efficiently and they can seek a common goal (Putnam, 2007). But in brief, SC means connections and communications between members of a network, which by creating norms and mutual trust, facilitates actions and achieving the goals of the members of the organization (Yan and Guan, 2017). In the existing literature, three dimensions are considered for SC, which contains structural, relational and cognitive aspects (Lang and Ramírez, 2017). The structural dimension of SC points to the general pattern of communications between actors in the network. Situations within the network are very important because they provide distinct access to information. Social-structural capital essentially provides the capacity and availability of individuals to information and resources (Mura *et al.*, 2013). The relation dimension of SC implies to the nature of personal relationships that develop among specific individuals that appears in the form of strong relations against weak relations. Strong relations, while facilitating the flow of relevant information, they also transferring implicit knowledge. The cognitive dimension of SC refers to common manifestations, interpretations and systems of common meanings among groups that individuals within the network perceive information and classify them. Common language and codes are the most important aspects of the cognitive dimension of SC (Yan and Guan, 2017).

The effect of KS on IB is different based on the influence of the social bonds with two parties. According to past surveys (Bolino *et al.*, 2002; Maurer and Ebers, 2006; Mura *et al.*, 2013), two aspects of SC, structural and relational SC, may be considered as a moderator in connection between KS and IB. A few studies show that employees tend to translate their KS attempts into a creation, promotion and implementation of the novel idea if their SC (relational and structural) rises (Mura *et al.*, 2013). Guiso *et al.* (2011) claim that high SC of individuals increases their IB and leads to increased investment in the economy. However, there is a lack of enough empirical studies to explore the moderation role of SC in this relation. So, we are one of the first studies investigating the impact of SC as a moderator on the link between KS and IB. According to these arguments, these hypotheses suggested:

H3. SC moderates the effect of KS (sharing practices) on IB.

H4. SC moderates the effect of sharing mistakes on IB.

The differences between different genders consider in diverse research in a field of organizational behaviors (e.g., Ahanchian and Ganji, 2017; Ganji and Johnson, 2020; Boateng *et al.*, 2015). A few surveys investigated the IBs among different genders. In terms of gender differences on IB, Ma and Yuen (2011) also shows that male participants more than their female counterparts highly rated the need to form relationships as a reason for KS in an online learning environment, making males more involved in sharing knowledge. According to social role theory, diverse social expectations for male and female cause social norms which highlight some attributes including control and competitiveness for males in comparison with some other attributes like collaboration, sociability and intimacy for females in social contacts (Abukhait *et al.*, 2019). Thus, difference in KS is predicted among different genders. For example, Lin (2006) found that females tend to share knowledge as they try to overcome traditional prototype regard to their professional progress. Abukhait *et al.* (2019) show that females are somewhat more cautious and less likely to share their knowledge with others. They also reported no significant relationship between KS and IB for the female group and suggest more studies showing the moderating effect of gender in the link between KS and IB. According to these arguments, we proposed following hypotheses:

H5. Gender-groups moderate the effect of KS (sharing practices) on IB.

H6. Gender-groups moderate the effect of sharing mistakes on IB.

The above hypotheses are shown in the conceptual model provided in Figure 1.

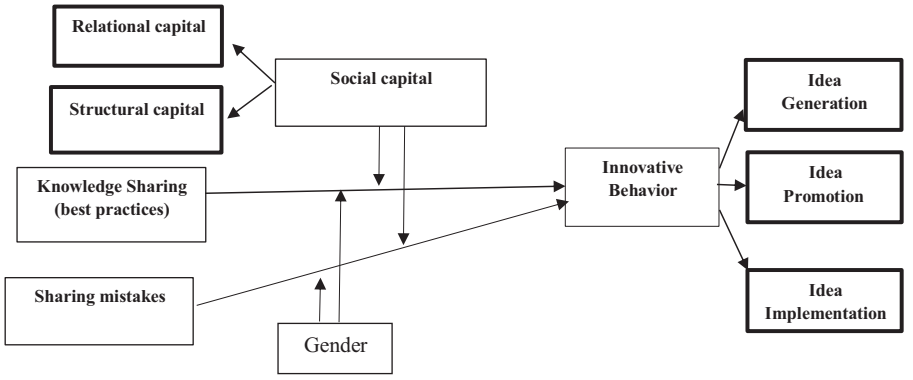

Figure 1.
Research model

3. Methodology

3.1 Research instrument

KS was assessed with five questions, which were taken from the questionnaire provided by Radaelli *et al.* (2014) and Swanson *et al.* (2020). To measure SC, the Mura *et al.* (2013) questionnaire was used with seven items. Measurement of sharing mistakes was accomplished using the Mura *et al.* (2013) questionnaire, which evaluates this construct with three items. In order to measure IB, the Mura *et al.* (2013) and Saether (2019) questionnaires were used measuring idea generation with two questions, idea promotion with three items and idea implementation with four questions. In the questionnaire, the opinion of the respondents was measured on a 5-point scale from 1 (extremely disagree) to 5 (extremely agree). The measures were localized for use in the context of an Iranian organization using the back-translation method. The face and content validity of the final questionnaire was confirmed by reviewing the comments of management specialists.

3.2 Data collection

The target population of this study are employees working in five energy companies in Mashhad city, estimated as about 1400 employees. In the current study, random sampling was used. 350 questionnaires were distributed among employees in these five companies randomly. Finally, 310 completed responses were analyzed with structural equation modeling (SEM) using partial least squares software (Smart PLS v. 3) and statistical package for social sciences (SPSS v. 19).

4. Research findings

4.1 Demographic findings

The characteristics of the participants in this study were investigated using the three demographic variables of gender, experience and degree of education. About 73% of respondents from these five energy companies were male ($N = 226$), in comparison to women with 27% ($N = 84$). Among respondents, 30% of participants had under five years of work experience ($N = 94$), 21% between 5 and 10 years' experience ($N = 65$), 9.5% between 10 and 15 years' experience ($N = 29$) and 39% more than 15 years' experience ($N = 122$). 18.7% of the respondents had a diploma or lower degree ($N = 58$), 36.12% with a bachelor's degree ($N = 112$), 33.88% had a master's degree ($N = 105$) and 11.30% with PhD degree ($N = 35$).

4.2 Measurement model and structural model

The study model was evaluated by Smart PLS 3 using SEM. The validity of the constructs was evaluated using the path coefficient shown in Table 1.

As shown in Table 1 all factor loadings were above the 0.4 which means they are suitable (Kline, 2015). Cronbach's alpha coefficient, composite reliability (CR) and average variance extracted (AVE) were also addressed in Table 2.

Based on Table 2, Cronbach's α values were more than 0.7 showing appropriate internal reliability. Convergent validity indicates the degree of correlation between the factor loadings of a variable. Although it has often been suggested a value of 0.5 to confirm convergent validity (Hair *et al.*, 2011), Fornell and Larker (1981) believe that AVE of less than 0.5 is acceptable if the CR coefficient is higher than 0.6 and indicates the validity of the questionnaire. According to Table 2, the CR values were more than 0.7 showing appropriate reliability (Hair *et al.*, 2011).

To examine the hypotheses, the partial least squares structural equation modeling (PLS-SEM) using Smart PLS 3 was used. Accordingly, if the values of the *t*-statistic are greater than 1.96, the relationship will be significant. The standard path coefficients are used to determine

Item	Factor loading	Mean Male ($N = 226$)	Mean Female ($N = 84$)
Sharing mistakes (SM) Mura *et al.* (2013)		2.12	1.67
1-I rarely share the errors I make in my task with my colleagues (*R*)	0.744		
2-I always talk about my working errors during formal meetings	0.797		
3-I am ok with sharing my working mistakes with other employees	0.870		
Innovative behavior Mura *et al.* (2013), Saether (2019)		2.26	2.34
Idea generation			
4- I often find novel ways, method or mechanisms to do my work	0.578		
5- I always create creative solutions for tackling work problems	0.720		
Idea promotion			
6-If I find an innovative solution, I often strive to make important organizational members enthusiastic	0.729		
7-If I find a creative idea, I often attempt to persuade people to approve this original idea	0.556		
8-If I find an creative idea, I often try to persuade other coworkers and managers into supporting it	0.680		
Idea implementation			
9-I consistently implement innovative ideas in my everyday tasks	0.621		
10- I am often active in the execution of innovative ideas for working purpose	0.640		
11-I am strongly work for the application of innovative ideas	0.801		
Social capital Mura *et al.* (2013)		2.30	3.15
Structural social capital (SSC)			
12-In my organization there is a regular communication between employees	0.496		
13-In my organization the informal communication between personals are very regularly	0.713		
14-In my organization, staff members share ideas with some specialists from other related organizations	0.664		
Relational social capital (RSC)			
15-When I need help, my coworkers are often ready to assist me	0.870		
16-I cannot trust the most of my coworkers since they are self-seeker (*R*)	0.832		
17-As my colleagues are so trustworthy, I can speak with them about my problems freely	0.633		
Knowledge sharing Radaelli *et al.* (2014), Swanson *et al.* (2020)		2.67	2.48
18-I often share my knowledge with my coworkers	0.739		
19-I often try to share my working experiences with others in meetings	0.899		
20-In informal communications, I am keen on sharing my knowledge with my colleagues	0.861		
21-I am engaged to answer other coworkers call for sharing my experience	0.813		
22- I always try to introduce some constructive comments to help less skilled colleagues	0.755		

Table 1.
Factor loadings and mean of each variable in different age groups

the effect of all independent components on the corresponding dependent variable (Figure 2). Accordingly, the larger the value of the path coefficient, the greater its effect will be and the sign of the path coefficient value will indicate the type of impact (direct or reverse).

The result of hypothesis tests is shown in Table 3.

As can be seen in Table 3, the effect of KS (β = 0.629, T-value = 9.295) and sharing mistakes (β = 0.334, T-value = 7.469) on IBs are significant. Moreover, the moderating effect of the SC is significant in the connection between KS (share best practices and share mistakes) and IB with respect to the T-statistic value.

Table 2.
Reliability and validity

Variable	R^2	Cronbach's α	Composite reliability	AVE
Knowledge sharing		0.908	0.904	0.653
Social capital		0.857	0.886	0.414
Sharing mistakes		0.846	0.939	0.559
Innovative behavior	0.902	0.865	0.933	0.507

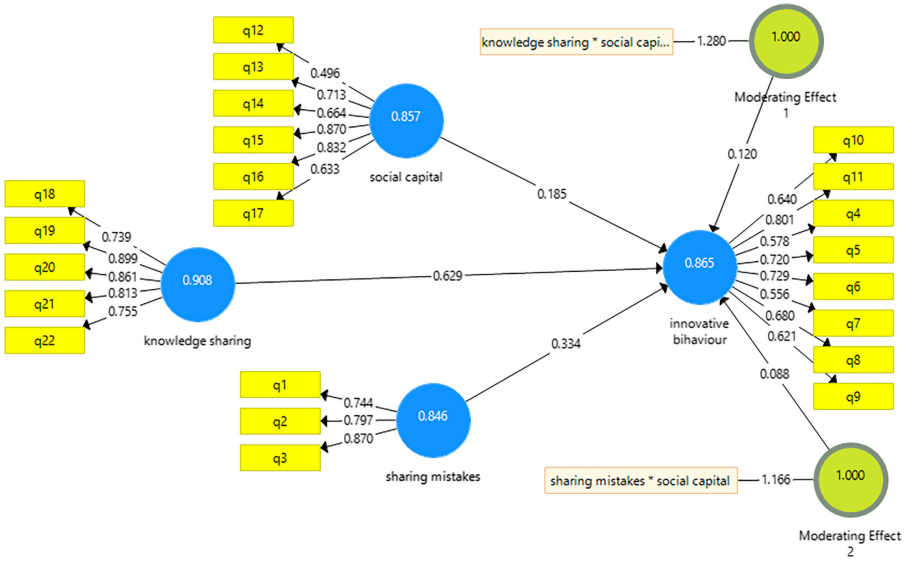

Figure 2.
Hypothesis test

Table 3.
Hypothesis tests

Relations	Path coefficient (β)	T Significant	Test result
Knowledge sharing → innovative behavior	0.629	9.295	Supported
Sharing mistakes → innovative behavior	0.334	7.469	Supported
Moderating impact of SC on the relation between KS (best practices) and IB	0.120	2.731	Supported
Moderating impact of SC on the relation between sharing mistakes and IB	0.088	2.422	Supported

4.3 SEM tests of gender differences

We test the moderating effect of gender by SEM. Table 4 contains standardized values and *t*-value for each group.

According Table 4, the results show that females share their best practices ($\beta = 0.742$) more than males ($\beta = 0.285$). In contrast, males ($\beta = 0.601$) share their mistakes more than their female colleagues ($\beta = 0.423$). However, there is not a significant difference between two gender-groups in the effect of KS ($\beta = 0.141$, *t*-value = 1.084) and sharing mistakes ($\beta = 0.139$, *t*-value = 0.864) on IB, shown the rejection of H5 and H6.

5. Conclusion

This study aims to analyze the effect of KS on IB, considering SC and gender-groups as moderators. To support our findings, 20 interviews with respondents of the questionnaire working in managerial positions in these five energy were conducted. A sampling strategy was a purposeful approach, analyzing with content analysis to understand main reasons of research findings.

The first hypothesis, showing the positive effect of best practice sharing on IBs was confirmed. The research findings demonstrate that staff who transmit his/her knowledge of optimize practices tend to be more innovative. This result provides the evidence to highlight the direct advantages which the knowledge sharer might gain throughout the process of KS, including greater IB. Other scholars have also shown that KS increases the innovativeness among human resources and companies (Lewin *et al.*, 2011; Charterina *et al.*, 2018). Radaelli et at (2014) and Mura *et al.* (2013) also explains that there is a direct and unbiased link between sharing best practices and IB. However, the mean of sharing best practices in these energy companies are lower than the average. The result of these interviews also support this finding. For example, one of the interviewees said that: "In our organization, most of the employees tend to abuse the new idea and present it as their own idea. So, I prefer to share my new idea with one of my colleagues who I fined him supportive. When I share my new ideas with him, he motivates me to peruse this new way and support me to implement it."

In terms of Hypothesis 2, the results show that sharing mistakes were strengthening the influence of good practices sharing on IB. Mura *et al.* (2013) also showed that the sharing of errors had an effect on the IB of staff members, which in turn stimulates more effort to create and promote novel ideas. The process of sharing mistakes creates rethinking on individual experiences and thus individuals can create new ideas as job solutions. This social interaction process in the sharing of errors facilitates converting information and experiences and creating new cognition by recombining the knowledge (Huber, 1991). The result also shows that the impact of sharing best practices on IB is more than the effect of mistake sharing. The reason is that sharing mistakes is more considered as a high risk behavior, which employees are not keen on to conduct, showing the *who's to blame?* contexts. Such a manner is shown in a working environment of the energy sector, as each employee is greatly secured of his/her independence (Friedson, 2001), and consequently do not share the mistakes easily. The result of the one sample *t*-test also shows that both male and female groups show a low level of mistake sharing behavior. This finding was also supported by the interviews. Interviewee employees believe that sharing the mistakes has its costs for individuals, leading them to low

Table 4. SEM results in different gender-groups

Hypothesis	Female ($N = 84$)	Male ($N = 226$)	|female - male |
Knowledge sharing → innovative behaviors	0.742 (6.689)	0.601 (11.956)	0.141 (1.084)
Sharing mistakes → innovative behaviors	0.285 (2.262)	0.423 (7.949)	0.139 (0.864)

level of mistake sharing in both male and female groups. They believe that employees just share their mistakes when they think they have a potential knowledge to help them to solve the problem, not for preventing others to make the same mistakes.

The moderating role of SC in the relation between KS and IB was confirmed. SC, through increasing the access to external resources, exchanges and knowledge absorption, as well as the efficiency of knowledge transfer, modifies the relation between KS and IB and positively influences the formation of IB. The results indicate that the higher employees tie with others, the higher they show IB. A number of studies (e.g., Mura *et al.*, 2013) show firm bond are essential for an effectiveness sharing of knowledge, since workers have more time to share their idea with its whole complexity (Hansen, 1999). The previous findings are also in line with this attitude that engaging in social media platform increases employees' capability to attract more support and implement new ideas. Interviews also support this finding. For example, one of the interviewees said: "as my relationship with other employees and managers are so strong, I can rely on their support to implement my new ideas."

The moderating effect of gender-groups in the link between KS and IB is not supported. Moreover, the results show that, the impact of best practice sharing on IB is more among females. They provide lower link between mistake sharing and IB in the female group, as sharing mistakes might endanger their fame in public (e.g. Husted and Michailova, 2002). So, females try to show their strength by sharing the best practices, leading them to gain more support to implement their ideas. This result is in consistent with the study by Lin (2006) which show the higher level of female-group KS as a method to overcome traditional boarders in organization. We conducted interviews with 10 females. One of the interviewees stated that: "as the energy sector is almost a male-dominant industry, I am less likely to fully share my mistakes with my colleagues who are mostly men.". Moreover, males are more confident to share their mistakes as the friendly environment provided among males in the organization. However, the results also show that there is not a statistically difference between males and females in terms of the impact of KS on IB.

5.1 Theoretical and practical implication

The engagement of staff members in creating, promoting and implementing novel ideas is essential for business progress. Most of the research on IBs to date has analyzed the way companies be able to trigger staff IB as a result of knowledge management (e.g. Charterina *et al.*, 2017; Lee, 2018) in the organizational or team level, without considering possible moderator effects. The present study, however, draws its focus to the micro-level of analysis, analyzing the impact of individual KS on his/her own IB, different based on individual gender and SC. There are a few studies investigating whether KS could increase the IB of the individual who share the knowledge. To make that clear, we addressed these research gaps: (1), a direct impact, due to lack of empirical studies, whereby KS including best practice sharing and sharing mistakes tends to stimulate the creation, promotion and implication of new ideas; (2), the absence of an indirect effect of KS on IB provides this question to what degree KS is by itself sufficient to encourage IB, so, to break this black-box, we analyze a moderator effect of SC (relational and structural capital) and different gender-groups on the effect of KS on IB.

Practically, involving in KS has some costs in regards to time and effort. It provides benefits to not only other employees but also knowledge sharers regarding compensation for innovation. According to institutional theory, managers should institute knowledge management into their organizational systems, introducing it also as a useful "workout" which may boost human resources awareness of internal and external knowledge, and their competence to address novelty and innovativeness at workplace. Authorities in the energy industry recommended to remove an opinion that "structured" KS is a time lost activity (supported by interviews result). Moreover, managers should build an organizational and

technological environment by the help of information and communication technologies as an important requirement for the sharing of knowledge, and in turn IB. The results also show that the employees less likely to share their mistakes with others. The organizations should provide the culture of mistake sharing by rewarding those employees who correct the potential errors in the system. They also should encourage a *learning from mistakes* culture (Cannon and Edmondson, 2005). Due to the impact of SC in strengthening the effect of knowledge management on IB, managers should provide the structural requirement of smooth communication in the organization and encourage the citizenship behaviors in the organization.

5.2 Limitation and further research direction

This study has few restrictions which could be considered in further studies. First, we specially concentrate on the energy sector. However, these organizations would be specifically good cases for investigating the link between knowledge and behavior, further studies would be concentrated on other less-investigated organizations like schools and police departments. Secondly, the cross-cutting form of the current research impedes us from addressing distinct causal deductions regarding the link between constructs. It is recommended that longitudinal research studies could tackle this problem. Further research might also strengthen our framework by including antecedents of knowledge management such as technical factors.

6. Conclusions

The current research brings to light the link of knowledge and innovativeness by putting in place in an individual-level model. We gathered data from respondents in the energy sector through the knowledge-innovation base environment, which is a less-studied sector. Our findings indicate that individuals who exchange their knowledge at the workplace are greater chance of involving in IB. The findings also indicate that the more individuals show structural and relational SC, the more their sharing knowledge behavior makes them innovative. Moreover, the moderator effect of gender-groups is not significant; however, sharing best practices are more likely to lead to IB for female groups. In contrast, males show more IB when they share their mistakes.

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