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The role of knowledge sharing and creative self-efficacy on the self-leadership and innovative work behavior relationship

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ABSTRACT

The current study employs social cognitive theory to analyze the moderated mediation model of self-leadership and innovative work behavior. Further, this research assesses the mediating impact of knowledge sharing, and the moderating effect of creative self-efficacy in the above-mentioned direct relationship. To test this model, data were gathered, at two different times, from 283 subordinates and 129 supervisors, working in various software companies in major cities in Punjab, Pakistan. The findings showed a significant impact of self-leadership and innovative work behavior. Additionally, the results supported the mediating role of creative self-efficacy in the association between these two qualities. Moreover, a higher level of knowledge sharing strengthens the link between self-leadership and innovative work behavior. The study revealed that self-leadership is vital in fostering innovative work behavior. This research recommends how businesses might use self-leadership strategies to promote innovative work behavior.

Introduction

Background

Rapid technological advancement in the current era necessitates higher management to adopt innovation to achieve organizational goals (Elsahn et al., 2020; Shabir et al., 2023a). Modernization also enables higher efficiency and international economic relations, and impacts individuals politically, socially, and economically (Ahmad et al., 2022). Considering the symbiotic relationships between science and technology, rapid change is inevitable in an ever-changing environment (Chughtai et al., 2023; Gaile et al., 2022). Also, it is necessary to compete in the advanced technological and globalized market for sustainability (Färber & Nazneen Islam, 2021). Virtual organizational structures have become a feasible option for organizations (Pangil & Chan, 2014) as they are not limited by boundary or tangibility; therefore, they not only benefit the business, but also contribute to the economy (Autio et al., 2021). The latest technology and innovative ways of doing things are possible only with the support of human capital (Castellano et al., 2021). Given the present era of advanced technology, the value and importance of tacit knowledge have increased for sustainable progress, implementation, and transformation (Bouncken & Barwinski, 2021; Castellani et al., 2021).

Owing to constantly changing environments, employees often encounter novel and ambiguous situations, thereby needing to strengthen their cognitive abilities in order to deal with them (Taeuscher et al., 2021). Researchers stated that innovation is one of the key tools for the success and competitive advantage of organizations (Chughtai & Khalid, 2023; Li et al., 2022). It has been observed that innovation depends mainly on employees' innovative work behaviors (IWB) that generate high quality performance and minimize flaws (Anjum & Zhao, 2022). Given this, IWB serve as a strategic and motivational tool (Uppathampracha & Liu, 2022) for

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organizations and individuals to enhance quality performance and profitability. Previous studies highlighted different factors influencing the IWB of employees, i.e., stress (Anjum & Zhao, 2022), organizational climate (Xu et al., 2022), learning organizations (Chughtai & Khalid, 2022), and different leadership styles (Khan et al., 2020; Ma et al., 2023; Messmann et al., 2022).

Further, the personal characteristics of individuals play a vital role in enhancing IWB (Afsar et al., 2019). Scholars found that self-leadership (SL) is an individual characteristic through which intentions and thoughts are cognitively navigated to make the desired changes for innovative products or services (Goldsby et al., 2021). Moreover, SL assists individuals in adapting strategies to control their behaviors and enhance their skills through specific cognitive and behavioral approaches (Goldsby et al., 2021). Through SL, individuals exhibit their awareness about thinking, emotions, and behaviors at work – which is promoted as a central concept in organizational behavior (Harari et al., 2021; Stewart et al., 2019). Subsequently, these aspects enhance employees' self-confidence, knowledge, and competencies, enabling them to achieve personal and organizational goals (Castellano et al., 2021). Moreover, SL is considered a self-influence procedure through which individuals derive self-motivation and self-direction (Neck et al., 2019), which are the necessary tools for IWB.

Researchers expounded that the innovation process is challenging and risky for both, the employees (Karimi et al., 2021) and the management of the organizations. Based on this, individuals require motivation and self-confidence as their inner driving strength to accept challenges (Liu et al., 2017). Some scholars have elaborated that creative self-efficacy (CSE) is considered the primary tool for generating and implementing innovative ideas because it is based on individuals' self-confidence, knowledge, and skills (Bandura 1986, Farmer & Tierney, 2017). Researchers have defined CSE as "the belief that one possesses the ability to produce creative outcomes" ((Tierney & Farmer, 2002), p. 1138). Moreover, scholars report that an increase in CSE leads to innovative performance (Christensen-Salem et al., 2021; Farmer & Tierney, 2017; Tierney & Farmer, 2002). Thus, this study assesses the mediating role of CSE in the relationship between SL and IWB.

Scholars also considered open innovation, which involved the challenge of allowing open exchange of knowledge while preventing knowledge leakage (Ahlfänger et al., 2022). Knowledge-donating organizations are less susceptible, as the primary focus switches from knowledge transfer to the active co-creation of new knowledge (Bouncken & Barwinski, 2021). Similarly, knowledge sharing (KS) is also an essential factor encouraging knowledge management and organizational innovations among individuals (Castaneda & Cuellar, 2020). KS is characterized as an activity where by knowledge, information, and expertise are exchanged among individuals, organizations, and communities (Hoang & Truong, 2021). The exchange of expertise through KS contributes to innovations and improvement in the products/services (Castaneda & Cuellar, 2020). Accordingly, new knowledge is gained with the exchange of expertise and skill, increasing employees' confidence and proficiency (Islam et al., 2022). Based on this notion, we argue that KS moderates the association of SL and CSE.

Pakistan, a strategically located emerging economy in South Asia, attracts foreign private investment in the Information Technology (IT) sector, which is one of the most important contributors to GDP (Ali et al., 2022). The government of Pakistan has been focusing significantly on this sector (Ullah et al., 2022), not only for the economy's growth, but also to facilitate the public by providing e-governance services (Nizam et al., 2020). Consequently, the Pakistani government has initiated 60 technology park projects that will be completed by 2023, 22 of which function completely in the major cities (Ullah et al., 2022). Currently, this sector has more than 300,000 professional experts and more than 20,000 IT engineers and graduates (Javed, 2020). However, this sector faces many issues, i.e., legal barriers, retention of human capital, capacity building, and lack of advanced technology (Nizam et al., 2020). Moreover, the knowledge-hiding behavior of employees affects teamwork and is one of the major hurdles to innovation (Chughtai et al., 2022). Further, acquiring new knowledge and replacing the old knowledge or techniques is difficult in developing countries (Rahman & Hasan, 2017). For instance, in developed countries, it was found that in case of sluggishness, practices become institutionalized, making them difficult to eliminate (Szulanski, 2000). Further, Mudami et al. (Mudambi et al., 2018) explained that integrating knowledge creation processes into a zooming-in and zooming-out perspective enables us to comprehend downstream market processes, and combines subnational, national, and multinational spatial scales. The operating complexities of key players involved in activities in geographical settings are not constant; their connections and cumulative innovation strategies are meaningful (Cano-Kollmann et al., 2016). Studies have identified that national innovation systems become intertwined in a global innovation network that spans geopolitical boundaries (Berman et al., 2020) and increase the profitability of the firms especially in uncertain circumstances (Shabir et al., 2023b). Additionally, institutional theory provides an innovative approach for assessing institutional change. One important assertion is that effective language use is essential for fostering institutional transformation (Wikberg, 2021). According to this idea, the utilization of informal institutional frameworks, such as networking based on benefits, trust, exchange, mutual dependence, family ties, social relationships, relationships that benefit both parties and business group networks, is far more important for innovation in some markets than in others. (Dau et al., 2022). Accordingly, self-strategies and the exchange of knowledge within a department or organization are essential for KS, which plays a significant role in enhancing IWB (Tangaraja et al., 2016).

The present study attempts to find the solution to the imperious issues faced by organizations in Pakistan, especially in the IT sector. Further, this study contributes to knowledge in personal and motivation psychology and organizational behavior. Firstly, the current study determines the antecedent of IWB within the context of the IT sector; by addressing the empirical gap suggested by Anjum & Zhao (2022). Secondly, it examines the impact of SL as a personal factor that helps to foster IWB. This study responds to the suggestions of Messmann et al. (2022), that individual traits and personal characteristics may facilitate the employees for IWBs. Moreover, the present study explores the mechanisms between the SL and IWB via CSE by addressing the gap, suggesting that creativity or hope may also influence the IWB of employees (Uppathampracha & Liu, 2022). Finally, this study uses KS as a moderating variable by answering the call of AlEssa & Durugbo (2021) and Akıncı et al. (2022), indicating that there might be some factors that indirectly drive IWB, as can be seen in Fig. 1.

Theoretical foundation

Social cognitive theory (SCT) (Bandura 1986) largely examines the reasons behind the demonstration of certain individual behaviors at the workplace (Chan & Lu, 2004). The most crucial premise of SCT is that attitudes and behaviors, which can also constantly change in the workplace, can inspire individuals' activities (Mccormick & Martinko, 2004). According to this theory (Bandura 1986), individuals' behavioral intention determines how people interact with the internal and external factors that influence their IWB. Rapid technological advancement forces organizations to follow the lens of SCT (Bandura 1986) and provide a conducive environment for IWB to the workforce. Furthermore, encouragement by the management to individuals regarding their skills, abilities, and confidence also enables them to generate and implement novel ideas confidently (Compeau et al., 1999). The premise of SCT explains that SL, being a personal and behavioral technique, allows individuals to enhance their coping

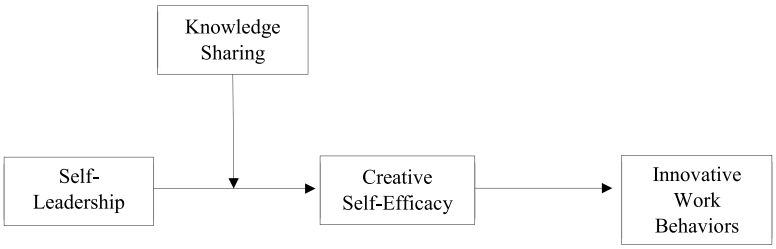

Fig. 1. Conceptual model.

skills (Neck et al., 2013), thereby encouraging them to accept challenges and risky tasks, leading to IWB.

Additionally, SCT suggests that self-regulatory processes influence several self-regulating mechanisms, e.g., self-motivation and self-confidence (Bandura et al., 1997). These self-regulatory developments in individuals regulate sufficient capability to accomplish specific risky tasks (Bakker & de Vries, 2021; Compeau et al., 1999). A strong belief in an individual's abilities and skills for achieving specific goals and tasks shows self-confidence (Bandura et al., 1997). From the standpoint of SCT, it is believed that the effective ability to perform as a self-leader can boost one's capability to lead oneself and others. Based on this notion, we argue that SL being a self-regulatory process, helps to organize the proficiencies of the individuals, which enhances the CSE and enables them for IWB. Moreover, studies indicated that individuals with a high level of CSE try to seek more information and knowledge from internal and external environmental resources to become more innovative (Farmer & Tierney, 2017; Tierney & Farmer, 2002). Knowledge is considered a consequence-based activity rooted in daily social life. Researchers refocus their attention on the knowledge in practice theories, portraying it as knowing in practice (Bouncken et al., 2020). Knowing in practice emphasizes continual activities that result in shared know-how across borders, such as face-to-face conversations, sharing, learning, or participation (Bouncken & Aslam, 2019). As a result, the division of work among team members considers both, the requirement to combine multiple knowledge bases, and the trade-off between the advantages of specialization and coordination costs (Haeussler & Sauermann, 2020).

There is growing interest in the concept of organizational learning concerning knowledge transfer and how organizations produce, maintain, and transfer knowledge (Bouncken et al., 2020). One of the most unexpected insights to emerge from this focus on knowledge and learning is that just because an organization possesses potentially important knowledge assets does not indicate that other areas of the company would benefit from them (Castellani et al., 2019). Operation of various organizational setups for knowledge transfer, including managerial interventions, and designing and re-designing organizational processes, could all be gained through a more profound look (Haeussler & Sauermann, 2020). In line with this, KS is a human behavior through which people exchange their tacit and explicit knowledge through information and experience with others at the workplace (Lim, 2021; Ryu et al., 2003). Moreover, KS also imparts confidence to the employees when they experience the similarity between their and others' knowledge (Bandura et al., 1997). Based on this notion, we argue that integrating these factors encourages and motivates the individuals for KS with others, which, in turn, not only generates information and knowledge, but also increases the CSE by utilizing self-strategies in the form of SL.

Literature review

Self-Leadership and innovative work behaviors

The concept of SL is associated with an inspiration-related cognitive process where individuals, through self-direction and self-motivation, navigate and lead themselves to achieve their desired objectives, goals, and behaviors at the workplace (Goldsby et al., 2021; Manz, 2012). SL encompasses behavior-focused strategies that enhance individuals' capabilities about self-management and self-consciousness of crucial and sometimes hostile behaviors at the workplace (Goldsby et al., 2021; Manz, 2012, Stewart et al., 2019). The cognitive strategies used by SL, such as concentrating on internal rewards, positive self-talk, positive psychological visuals, and reshaping counterproductive assumptions and beliefs, are all intended to form behaviors via internalized cognitive abilities (Goldsby et al., 2021; Harari et al., 2021). These strategies include self-observation, self-goal setting, self-motivation, self-direction, and self-coaching (Stashevsky et al., 2006). These self-influences enable individuals to identify specific behaviors that motivate them to accomplish challenging tasks by avoiding mistakes and errors (Manz, 2012; Stashevsky et al., 2006). It is pragmatic that individuals with SL characteristics navigate their thoughts to improve their work, innovate, and create the changes that they desire (Mustika et al., 2020). Innovation is the key element for value creation (Cano-Kollmann et al., 2016). Research has increasingly been elucidating that IWB is related to generating and implementing sound, and novel ideas to create and develop new products and services (Muchiri et al., 2020; Uppathampracha & Liu, 2022). Moreover, self-leaders' behaviors positively enhance organizational performance through creativity, innovation, and cooperation (Mustriwati et al., 2021). It is evidenced from previous studies that SL qualities boost the motivation and self-confidence level of employees (Goldsby et al., 2021; Kör, 2016); these enforce self-direction and self-management, which eventually convert these cognitive strategies into IWB (Gomes et al., 2015; Mustika et al., 2020). Based on the SCT and the discussion above, it is hypothesized that:

Hypothesis 1: Self-Leadership is positively related to Innovative Work Behavior.

Creative self-efficacy as mediator

Creative self-efficacy (CSE) is the faith that one possesses the necessary knowledge and skills to produce innovative results (Karwowski et al., 2018). Tierney & Farmer (2002) introduced the concept of CSE, inspired by the notion of 'self-efficacy' by Bandura (Bandura et al., 1997) and 'work-related self-efficacy' by Gist & Mitchell (1992). In simple words, the CSE of a person is related to the beliefs and self-confidence to generate and implement creative and innovative outcomes (Farmer & Tierney, 2017; Tierney & Farmer, 2002). SL works as a cognitive resource to produce creative and innovative outcomes by integrating self-direction, self-motivation, and self-control (He et al., 2020). These self-strategic resources, in the form of SL, enable individuals to adapt their thinking patterns and improve their self-beliefs and intellectual imaginations about their abilities and skills for higher performance (Mansor et al., 2013). Furthermore, SL has been found to develop CSE, as it is concerned with leading oneself, whereas leadership is associated with leading others (Goldsby et al., 2021; Harari et al., 2021). Individuals with a high sense of CSE demonstrate IWB owing to the confidence gained from their experiences and

knowledge for generating and implementing novel ideas (Jiang & Gu, 2017). Also, these individuals possess the capacity to solve complex and risky problems creatively, thereby leading to IWB (Karimi et al., 2021; Park et al., 2021). Employees with SL qualities are self-motivated, self-planned, and self-determined, which also boosts their innovative abilities (Mustika et al., 2020; Stewart et al., 2019), which are necessary for the problem-solving process through the novel ideas to save time and cost. Innovative employees are more valuable in organizations that add importance to cross-institutional, industrial, and technological boundaries (Lorenzen & Mudambi, 2013). Moreover, persons with a higher sense of self-efficacy also feel psychologically confident in addressing uncertain and challenging circumstances and are more likely to perceive them as opportunities (Richter et al., 2012). Further, past studies indicated that CSE is an imperative predictor of several positive outcomes, i.e., creativity, innovation, and higher performance (Karwowski et al., 2018; Khan et al., 2022; Tierney & Farmer, 2002). Based on the concepts, this study contends that these SL strategies enhance the sense of CSE of the individuals, which leads to IWB. Thus, it is hypothesized that,

Hypothesis 2: Creative Self-Efficacy mediates the relationship between Self-Leadership and Innovative Work Behavior.

Knowledge sharing as moderator

Knowledge is considered a core asset for the growth, development, survival, and competitive advantage of organizations (Xu & Cavusgil, 2019). Moreover, creating and exchanging knowledge within organizations create value and enable them to grow and transform organizational structures (Bouncken et al., 2020, Bouncken et al., 2021). Scholars have characterized KS as "a social interaction culture involving the exchange of employee knowledge, experiences, and skills through the whole department or organization" ((Lin, 2007), p. 315). Moreover, exchange of ideas with desired people, via conversation and interaction, is also known as KS (Castaneda & Cuellar, 2020). Also, interpersonal relationships lead to innovational practices that emerge from the bottom up, through the interplay of individuals, who explore, engage, merge, adapt, spin-off, and even steal from one another (Li et al., 2022). Such IWB is displayed by innovative people, who are more concerned with knowledge outputs than with company performance results (Jin et al., 2022). Innovation through personal interactions is a process of ongoing interactions between individuals with various goals, experiences, and knowledge (Lorenzen & Mudambi, 2013). The quality and quantity of interaction between human capital, the willingness to apply knowledge, and the individual's skill influence KS (Liao, 2006). KS ensues when a person is eager to engage in knowledge gathering and contribute to generating new ideas (Bock & Kim, 2002). Thus, KS is "the process where individuals mutually exchange their knowledge and jointly create new knowledge" (Van Den Hooff & De Ridder, 2004), p. 118. Moreover, it has been found that KS is a coping behavior that facilitates individuals when people exchange their knowledge at the workplace to solve complex problems or improve performance (McCarthy et al., 2019). The culture of KS helps organizations to enhance creativity, while at the same time, allowing individuals to boost their self-confidence (Mittal & Dhar, 2015). Moreover, when employees feel that their knowledge matches that of their colleagues in the KS organizational culture, it enhances their CSE (Wang & Noe, 2010). Accordingly, we argue that KS may serve as an effective coping tool for individuals, enhancing their confidence to deal with challenging, risky, and uncertain situations with creative solutions. The exchange of knowledge, through discussions among employees, imparts psychological strength for generating and implementing novel ideas to them, which enables them to enhance their capabilities, self-sufficiency, and professional performance (AlmulhimM, 2020). Some scholars stressed that the exchange of knowledge strengthens employee learning through which they enhance their involvement in creative and innovative activities by solving complex organizational problems at the workplace (Gerlach et al., 2020; Saffar & Obeidat, 2020). The researchers of this study argue that the process of exchanging knowledge of self-motivation and self-management with peers provides cognitive strength in their creative self-confidence that may lead to higher creative skills and abilities. Thus, it is hypothesized that,

Hypothesis 3: Knowledge sharing moderates the relationship between Self-Leadership and Creative Self-Efficacy.

According to SCT, employees are expected to influence and lead by employing cognitive and behavioral approaches (Bracht et al., 2021). Individuals' CSE increases through successful utilization of the skill of self-strategies (SL), and they are more likely to engage in IWB because they are self-assured and able to generate and execute strategies at work (Jiang & Gu, 2017). Thus, this study proposes that CSE mediates the link between SL and IWB. Further, we expect that the best way for employees to get the most out of the organization's accumulated knowledge is through high-KS, which provides more opportunities for them to strengthen their confidence, share information, interact, and influence others (Bradshaw et al., 2015). Scholars also stated that innovation results from knowledge development (Wang & Noe, 2010). Likewise, scholars conversed about open innovation, which is an organizational strategy to seek knowledge and support its global orchestration initiatives with regional spawning that harnesses new local contacts (Ahlfänger et al., 2022). Further, local knowledge-intensive economic links, such as business leaders, local research, development outsourcing, innovation projects, and partnerships between specializing in specific and knowledge-intensive local enterprises, have gained relevance with the evolution of the knowledge economy (Lorenzen et al., 2020). Following this, the self-leaders are considered to be more able to implement tasks and achieve changes when organizational members possess a high level of KS (Loebbecke et al., 2016). Thus, a high level of KS strengthens the mediated relationship of SL and IWB via CSE. Thus, it is proposed that,

Hypothesis 4: Knowledge Sharing moderates the indirect effect of Self-Leadership on Innovative Work Behaviors via Creative Self-Efficacy.

Methodology

Procedure and participants

The present study's population includes organizations from the IT sector. The reason for selecting this population is that, in the current era, development in every area of life and business depends upon the successful application of software that helps the government and private organizations deliver their services to the public (Javed, 2020). Especially in Pakistan, which is a developing country, the IT sector contributes to the economy by exporting IT services to developed countries (Javed, 2020). Due to rapid globalization, developed countries remain developed, while developing countries remain in their positions because they are unable to focus on adopting and implementing innovative behaviors in their societies and organizations (Javed et al., 2021).

Employees of software companies voluntarily participated in the survey conducted through their human resource departments, which were approached through the author's contacts. Before distributing the survey questionnaire to the respondents, they were briefed about the objectives and purpose of this study. For data collection purposes, the present participants were approached in two different periods, separated by a month to, overcome the common method bias (Podsakoff et al., 2012).

We distributed 500 questionnaires to the subordinates in the first phase to collect their responses about SL (predictor variable) and CSE (mediating variable), and we received 375 responses. Further, in the second phase, we distributed questionnaires to collect the opinion of

participants for KS (moderating variable) from the subordinates of those who participated in Phase 1. Moreover, 175 questionnaires were distributed to the supervisors of the individuals to collect the opinion about IWB (criterion variable) of their subordinates. Finally, 283 correctly filled questionnaires from subordinates and 129 from supervisors were considered for further analysis, constituting a response rate of 56.6 % and 73.71 %, respectively.

Measurement scale

All measurement scales of the present study were adopted from previous studies; all items of all scales were measured on a five-point Likert scale which ranged from 1 to 5, denoting "strongly disagree to strongly agree." The survey questionnaire of the present study consisted of 29 questions divided over five-sections, i.e., 'demographic (gender, age, education, experience),' 'predictor (SL),' 'moderator (KS),' 'mediator (CSE),' and 'criterion (IWB)' variables.

Self-leadership was measured by a nine-item (ASLQ) by Houghton et al. (2012)

The sample items included, "I try to mentally evaluate the accuracy of my own beliefs about situations I am having problems with;" "I establish specific goals for my own performance."

Creative self-efficacy was measured through a six-item short-scale developed by Karwowski et al. (2018)

The sample items included, "I know I can efficiently solve even complicated problems;" "Many times, I have proved that I can cope with difficult situations."

Knowledge sharing was measured using an eight-item scale adapted from Lu et al. (2006)

The sample items included, "I share useful work experience and know-how with others;" "In the workplace, I express and share my knowledge with more people."

Innovative work behaviors were rated by their direct/immediate officers/managers using six items developed by Scott & Bruce (1994)

Sample items included, "This employee searches out new technologies, processes, techniques, and/or ideas;" "This employee is innovative."

Control variables

In the present study, the demographic variables (gender, age, education, experience) were controlled as it was noted in previous studies that these control variables affect the relationship between SL and IWB (Park et al., 2014; van Dorssen-Boog et al., 2021; Wang et al., 2018).

Results

Reliability and validity of the model

Table 1 shows the values of Alpha, composite reliability (CR), average variance extracted (AVE), and factor loadings which were calculated to measure the reliability and validity of the model. The primary purpose of the CR is to measure the internal consistency of the model between the variables, and a minimum threshold of acceptance is 0.700, suggested by Nunally & Bernstein (1978), while factor loadings are utilized to check the reliability of each item with a minimum threshold of acceptance of 0.700, as suggested by Sarstedt et al. (2014). Moreover, the Alpha value of the variable shows that discriminant reliability has been established, and the minimum acceptance threshold is 0.700, as suggested by Nunally & Bernstein (1978). Lastly, the AVE values of the constructs show the amount of variance that is seized by a construct in connection with the total variance due to measurement error, and the values of the variables used in the present study meet the minimum acceptable threshold of 0.500 as suggested by Bagozzi & Yi (1988).

Table 1
Reliability, convergent and discriminant validity.

Self-Leadership		**VIF**	**Loadings**
	SL_01	2.492	.805
	SL_02	2.341	.800
CR = 0.941	SL_03	2.669	.820
AVE = 0.639	SL_04	2.510	.811
Alpha = 0.92	SL_05	2.245	.792
	SL_06	2.164	.774
	SL_07	2.399	.801
	SL_08	2.233	.779
	SL_09	2.439	.813
Creative Self-Efficacy		**VIF**	**Loadings**
	CSE_01	2.157	.817
CR = 0.931	CSE_02	2.489	.839
AVE = 0.692	CSE_03	2.167	.816
Alpha = 0.91	CSE_04	2.731	.853
	CSE_05	2.769	.853
	CSE_06	2.191	.812
Knowledge Sharing		**VIF**	**Loadings**
	KS_01	2.697	.837
	KS_02	2.471	.812
CR = 0.942	KS_03	2.825	.839
AVE = 0.670	KS_04	3.058	.863
Alpha = 0.93	KS_05	2.518	.805
	KS_06	2.383	.791
	KS_07	2.344	.793
	KS_08	2.566	.807
Innovative Work Behaviors		**VIF**	**Loadings**
	IWBs_01	2.288	.813
CR = 0.930	IWBs_02	2.392	.810
AVE = 0.688	IWBs_03	2.625	.860
Alpha = 0.91	IWBs_04	2.575	.845
	IWBs_05	2.630	.827
	IWBs_06	2.467	.818

To check the common method bias (CMB), we adopted several methods as suggested by earlier researchers. According to Kock (2015), if the VIF value of each item of all study variables is less than five, there is no CMB, as seen in Table 1. Moreover, for cross-verification of CMB of data, the Harman (1967) single factor analysis was conducted, and the cumulative percentage value was 38.16 % which was less than 50 %, which showed no problem of CMB. Further, Bagozzi et al. (1991) suggest that if the correlation values of study variables are less than 0.900, there is no CMB.

Measurement model

Confirmatory factor analysis (CFA) was performed through AMOS to ensure the model's fitness. Table 2 shows the values of CFA, where the value of Chisq/df is 2.64, which is below 3, the acceptable indicator for acceptance, as suggested by Hair et al. (2010) and Hu and Bentler (1999). Moreover, the values of Goodness of Fit (GFI) = 0.901, Adjusted Goodness of Fit Index (AGFI) = 0.801, Comparative Fit Index (CFI) = 0.953, Tucker Lewis index (TLI) = 0.903, Normed Fit Index (NFI) = 0.898, Root Mean Residual (RMR) = 0.096, and Root Mean Square Error Approximation (RMESA) = 0.076, were all found to be within the acceptable range for model fitness as recommended by Hair et al. (2010) and Hu and Bentler (1999).

Descriptive statistics

Table 3 shows the mean, Standard deviation, and correlation values, where all variables are positively and significantly correlated at a significance value of 0.01.

Table 2
Measurement model.

Acceptable Range	Fitness Criteria	Measurement Model
1–3	Chisq/df	2.64
>0.90	GFI	.901
>0.80	AGFI	.801
>0.95	CFI	.953
>0.90	TLI	.903
>0.90	NFI	.898
<0.09	RMR	.096
<0.08	RMESA	.076

Hypotheses testing

Table 4 shows the values calculated by utilizing PROCESS-macro with a bootstrapping sample of 5000, as suggested by Hayes (2015), Hayes (2018). *The first portion* of Table 4 shows the values of direct effect, which reveals that SL positively influences IWB, where b = 0.488, SE = 0.054, t = 9104, p < .001, LL/UL = 0.383/0.593); thus, it proves Hypothesis 1 of this study. *The first portion* of Table 4 also shows the indirect effect values, which reveal that CSE positively mediates the relationship between SL and IWB, where b = 0.344, SE = 0.092, LL/UL = 188/0.551), therefore, the second hypothesis of this study is also proved. *The second portion* of Table 4 shows the interactive effect values, which reveal that SL is positively linked with CSE, where b = 0.267, SE = 0.064, t = 4.140, p < .001, LL/UL = 0.140/0.393, KS is positively and significantly linked with CSE, where b = 0.688, SE = 0.068, t = 10.120, p < .001, LL/UL = 0.554/0.822, and interaction (SL x KS) also significantly and positively influences the CSE, where b = 0.032, SE = 0.054, t = 4.3.14, p < .001, LL/UL = 0.016/0.079; this confirms Hypothesis 3. We plotted the interactive graph at ±SD for further explanation of the moderation effect, which shows the interactive graph, indicating a higher level of KS with a higher level of CSE resulted in higher IWB, as illustrated in Fig. 2. *The third and fourth portions* of Table 4 show the values of conditional indirect effects and moderated mediation index, revealing that the indirect effect of KS moderates the indirect relationship between SL and IWB via CSE less than the mean level, where b = 0.199, SE = 054, t = 3.658, p<.001, LL/UL = 0.092/0.306, at the mean level, where b = 0.141, SE = 0.052, t = 2.708, p < .01, LL/UL = 0.039/0.244 and over the mean level, where b = 0.083, SE = 0.061, t = 3.370, p < .01, LL/UL = 0.036/0.203. Moreover, the moderated mediation index values show that a higher level of KS with higher SL and CSE resulted in higher IWB, where b = 0.203, SE = 0.058, t = 3.491, p < .001, LL/UL = 0.089/0.318; thus, these results support Hypothesis 4 of this study.

Discussion

This study aimed to examine the relationship between SL and IWB, with the mediating mechanism of CSE and the moderating role of KS, by employing SCT in the IT sector of Pakistan. The goal was to determine how SL affects the IWB of employees through certain mechanisms in today's rapidly changing IT sector. First, the present study proposed that SL is positively and significantly linked with IWB. Further, the results supported this and were consistent with the findings of earlier studies (Asbari et al., 2021; Goldsby et al., 2021; Harari et al., 2021; Mustika et al., 2020), indicating a positive and significant relationship between SL and IWB. These findings suggest that self-strategies are the best-fit predictors of IWB for employees of IT sector organizations (Khan et al., 2023). Further, self-motivated, self-management-oriented, and self-planned employees, by focusing their minds on achieving specific goals, work as core capital for achieving market demands through their IWB (Khan et al., 2020). Earlier studies also revealed that SL is an efficient self-strategic source that enables individuals to willfully and productively navigate their thoughts and aims to achieve the desired targets, changes, and developments, leading to innovations (Goldsby et al., 2021; Harari et al., 2021; Manz, 2012; Neck et al., 2019; Stewart et al., 2019). Further, the mediating role of CSE between SL and IWB was also supported,

Table 3
Descriptive statistics and correlations.

Variables		Mean	S.D	1	2	3	4
1	SL	4.33	1.2723		.381**	.452**	.400**
2	CSE	4.32	1.3492			.438**	.490**
3	KS	4.39	1.2995				.471**
4	IWBs	4.43	1.3226				

Note: SL, self-leadership; CSE, creative self-efficacy; KS, knowledge sharing; IWBs, innovative work behaviors;.
** p < .01.

Table 4
Hypotheses testing.

Models	Effect	SE	t	p	LL	UL
Direct Effect and Indirect Effects						
Direct Effect	.488	.054	9.104	.000	.382	.593
Indirect Effect	.344	.092			.188	.551
Interaction Effects						
SL → CSE	.267	.064	4.140	.000	.140	.393
KS → CSE	.688	.068	10.120	.000	.554	.822
SL x KS → CSE	.032	.054	4.314	.000	.016	.079
Conditional Indirect Effects						
Less than mean	.199	.054	3.658	.000	.092	.306
At mean	.141	.052	2.708	.007	.039	.244
Above than mean	.083	.061	3.370	.002	.036	.203
Moderated Mediation Index						
SL x KS → CSE → IWBs	.203	.058	3.491	.001	.089	.318

Note: SL, self-leadership; CSE, creative self-efficacy; KS, knowledge sharing; IWBs, innovative work behaviors; Bootstrap sample size = 5000; LL, lower limit; UL, upper limit.

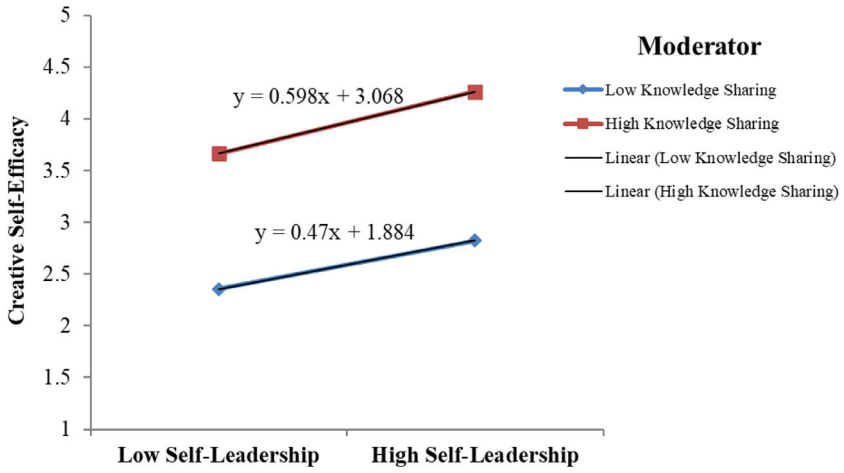

Fig. 2. Interaction graph.

and findings were in line with previous studies (Cheng et al., 2021), showing that higher dependence of organizations on technology for quality products or services to meet the demands of consumers forces the IT sector to invent the latest technological systems. Researchers have found that the presence of highly talented employees in a nation's workforce fosters innovation, particularly in science and technology (Marino et al., 2020). Moreover, the findings suggest that the IWB of the employees can also be enhanced if they are confident of their creative and innovative skills (Newman et al., 2018; Park et al., 2021). These employees' capabilities, combined with self-motivation, self-control, and self-management strategies, enable them to demonstrate greater IWB (Alameri et al., 2019; He et al., 2020). This study indicated that SL allows individuals to strongly believe in their creative skills and abilities (CSE) through which they can be skillfully engaged, and yield IWB (Goldsby et al., 2021; Harari et al., 2021). Further, the current study indicated that CSE is an important employee resource that helps develop IWB. Similarly, Nathan (2015) found a positive, although minor, impact of competent employees' impacts on individual innovation performance. In addition, the findings suggested that, to generate IWB, individuals should believe in their attributes and boost their self-determination (Harari et al., 2021). Moreover, the hypothesized moderating role of KS on the association between SL and CSE was also supported by, and consistent with prior studies (Saffar & Obeidat, 2020; Ye, Liu, & Tan, 2021), which demonstrated that exchange of knowledge at the workplace increases the confidence level of employees when they sense matching knowledge and skills in their colleagues. Furthermore, when businesses use collaboration to increase their knowledge, they are frequently encouraged to share their expertise with others so that everyone can gain access to more knowledge (Massaro et al., 2019). Specifically, sharing knowledge and experience from a tacit source increases employees' self-confidence (Asbari et al., 2021). During the KS process, the feeling that their colleagues possess similar knowledge increases employees' self-confidence, which is the core component for demonstrating IWB (Xu & Suntrayuth, 2022). Thus, such employees reflect KS behaviors that increase their creative self-confidence, which is the core component of coping with pressure at the workplace, when facing complex problems (Asbari et al., 2021). Earlier studies also supported this study's notion that higher KS behaviors generate higher CSE for self-motivation, self-control, and goal-orientation (Asbari et al., 2021; Islam et al., 2022). These findings further explain that KS imbibes a higher sense of CSE, with higher self-strategies, in employees. Finally, the moderated mediation model of this study proposed that in the presence of SL, a higher level of KS leads to IWB via CSE. The results of this study support the notion that when individuals are cognitively strong in their self-strategies and engage in higher-level KS activities at the workplace, it leads to CSE, which enables them to demonstrate higher IWB. In other words, the findings indicate that high KS strengthened the link between SL and IWB via CSE. Further, it is seen that sluggish networks result in stagnation and, ultimately, a low level of innovative tendencies (Szulanski, 2000). Researchers have examined the main distinctions between stability and change, emphasizing the contingencies that could impact the innovative outcomes of both, stable and flexible connections (Soda et al., 2019). For example, if the intended innovation process necessitates complex knowledge transfer, scholars caution that receiving different insights over time may be detrimental to innovation (Chughtai & Khan, 2023; Micheli et al., 2020). Furthermore, scholars assert that IWB is the key component for competitive advantage, and KS facilitates organizations to achieve this by enabling the employees to help each other tackle complex technical problems through discussion (Xu & Suntrayuth, 2022). Therefore, this study revealed that tacitly and explicitly gained KS strengthens the relationship between SL and IWB via CSE. In this particular aspect, managers, especially in the IT sector, must understand that KS is essential to achieve and maintain a competitive advantage. Moreover, the results of this research demonstrate that SL strategies influence individual achievement due to the employees' goal-directed, self-regulating improvisatory learning activities (Woods, Napiersky, & Rivkin, 2022).

Theoretical implications

From the theoretical perspective, the present study provides further understanding of the relationship between SL and IWB via CSE by applying the theoretical lens of SCT. Pakistan is a developing economy, but it has the potential for the youth to gain higher education in information technology. The results of this study support the notion that IWB in the IT sector can be boosted with the support of CSE, which can be enhanced with SL. This mediating mechanism was established by the notion of SCT and highlighting the importance of CSE for higher IWB. Also, this study explains the moderating role of KS as an environmental factor that influences people's cognitive levels through motivation; employees feel confident when they observe similarity in knowledge and expertise with others. Persons with technical skills and higher education should be self-motivated; if the organization's environment boosts their beliefs about innovation and polishes their skills and abilities by encouraging knowledge exchange, it would resultantly lead to higher IWB.

Practical implications

The findings of this study provide valuable suggestions to organizations and practitioners on how they can increase the level of CSE

and IWB in the workplace. For that purpose, IWB is the only way for today's businesses to gain a long-term competitive advantage (Muchiri et al., 2020). Further, it is suggested that institutions could adopt integrated systems, both formal and informal, as inadequate legal frameworks may offer incentives and possibilities driving certain opportunity seekers from the formal into the informal economy. Moreover, poor formal welfare systems may drive people to seek survival in the informal market (Ault & Spicer, 2022). Thus, when these two institutional effects are considered together, it appears that a country's formal institutional characteristics may determine multiple avenues of entry into the informal sector, rather than providing a single corridor. Further, it would be advantageous for managements to add CSE as an appraisal tool for their employees, so that training and workshops can be arranged to enhance their skills. SL is an imperative tool that enables organizations to enhance positive outcomes for the employees; therefore, the management organizes training and seminars and provides on-the-job mentoring to the workforce about self-management, self-control, self-planning, self-motivation, and self-determination as self-strategies, as these are the core strategies which enable the individuals to take initiative.

Further, the organizations could create co-working area that fosters diversity, independence, and innovation, thereby influencing an interconnected space. The various interactions could enable collaborative and competitive features to coexist or combine. (Bouncken & Tiberius, 2023). Therefore, it is suggested that IT organizations embrace a KS culture and SL to improve the creative skills and attitudes of the staff, because self-strategies work as intrinsic motivation and confidence for novel and creative thinking in individuals. As a result, SL is an effective way for management to establish the creative skills of the workforce, which develops the self-strategies for effective solutions to problems. Management boosts the creative spirit of the workforce by establishing the culture of KS in the organization, because when employees feel knowledge similarity with their peers through KS, they feel confident about their knowledge, skills, and abilities. Moreover, this study also suggests that management must encourage the risk-taking culture in the organization to solve complex problems; this will result in higher motivation and CSE, which intrinsically compel employees to demonstrate IWB. By using subordinates' personal characteristics, such as SL and CSE, organizations achieve IWB. As the IT sector is profoundly reliant on employees, gaining the confidence of the workforce is essential to achieve innovative results. The study also indicated that CSE and KS are vital for improving IWB, since they foster employee confidence in their ability and knowledge to perform specific tasks.

Limitations

The present study has some limitations, which also provide new avenues for research in the future. First, the present study examined the model in a single private sector service organization; future researchers could replicate this model in the public sector and manufacturing organizations in developing countries. Secondly, this study focused on IWB as an outcome; future research could investigate other outcomes, such as career success, organizational sustainability, and thriving at work. Thirdly, in the current study, we assessed CSE as a mediating variable; future studies may investigate other, or include more mediators, such as work engagement. Fourthly, this study uses SL as a moderator for the enhancement of CSE and, indirectly, IWB; it is suggested that future researchers generalize this study's findings to use personality characteristics (i.e., negative, and positive) as moderators for the enhancement of IWB. Finally, this study focused on the IT sector; it is suggested that future researchers apply this study's model to different sectors (i.e., other service and manufacturing sector organizations).

Conclusion

By infusing SCT, this research aimed to investigate the impact of SL on IWB, with the mediating and moderating role of CSE and KS, in the IT sector of Pakistan. This study revealed that SL is an effective type of leadership that helps individuals enhance their CSE by believing in their abilities and developing confidence. Further, it is found that KS is a robust moderator that intensifies the CSE, ultimately leading to IWB. In other words, the impact of SL on IWB via CSE is strengthened with a high level of KS in the organization. The study findings are believed to inspire organizational researchers to pursue this investigation further and advance new insights that will benefit the IT industry and the literature on organizational behavior.

Ethics statement

This study was carried out following the recommendations of the Ethical Principles of Psychologists and code of conduct by the American Psychological Association (APA). All participants gave written informed consent following the Declaration of Helsinki. The ethics committee approved the protocol of International Islamic University, Pakistan.

Data availability statement

The datasets generated and analyzed during the current study are available from the corresponding author on reasonable request.

Declaration of Competing Interest

The authors declare no conflict of interest.

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