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The dynamics of leadership on innovative behavior: A study of Indonesia's non-metallic minerals industry

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Abstract

Aim/purpose – The purpose of this paper is to investigate the impact of transformational leadership (TL) on innovative work behavior (IWB) among middle management in the non-metallic mineral products industry, focusing on job crafting (JC) and knowledge--sharing behavior (KSB) as mediating factors.

Design/methodology/approach – Employing a cross-sectional design, this study investigated the non-metallic minerals industry in Indonesia through a deductive approach. Data was collected from an online survey of 237 middle management personnel. A partial least squares SEM and mediation analysis using the bootstrap method were used for the data analysis.

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Findings – The study reveals that TL significantly enhances KSB and IWB among middle management in the non-metallic minerals industry. However, JC did not considerably affect IWB and did not mediate the TL-IWB relationship, challenging the established paradigms. These results underscore the complex dynamics between leadership, innovation, and JC, highlighting the need for further research into contextual factors that influence these relationships and the pivotal role of KSB in driving IWB.
Research implications/limitations – This study enhances the social exchange theory (SET) by examining the interplay between TL, JC, KSB, and IWB in Indonesia's non-metallic minerals sector. Practical insights include leadership training for fostering innovation and embedding knowledge sharing into daily routines to enhance innovations among middle management.
Originality/value/contribution – This research offers novel insights into the intricate roles of TL, JC, and KSB in fostering IWB within the Indonesian non-metallic minerals sector. It challenges the existing paradigms about JC roles, highlighting the conditional influences of organizational context and leadership dynamics on IWB.

Keywords: innovative work behavior, transformational leadership, middle management, non-metallic minerals sector.

JEL Classification: M10, M50, M54, L69.

1. Introduction

In today's era of intense competition, innovation has become a foundational strategic pillar for organizations down to the individual level globally, highlighting the importance of a creative and adaptive approach to meet the ever-evolving organizational challenges (Afsar et al., 2019; Dahiya & Raghuvanshi, 2022). Caniëls and Veld (2016) emphasized that maintaining a focus on innovative work processes, satisfying service delivery, and developing innovative products is essential for both organizations and individuals to sustain their growth. Research has increasingly underscored the significance of innovative work behavior (IWB) across various organizational levels and in-network or group interactions (Chen et al., 2018; Mustafa, Badri et al., 2022; Mustafa, Hughes et al., 2022). Recent years have seen a marked increase in interest in IWB research among scholars and practitioners, indicating a significant shift in how IWB is understood and assessed within the workplace. Contributions from studies by Miao et al. (2017), Hansen and Pihl-Thingvad (2018), and others have expanded our understanding of IWB dynamics.

However, our investigation reveals specific challenges middle management faces in implementing IWB. A primary obstacle is the lack of proactive measures to tailor work to individual interests and skills, which hampers motivation and performance enhancement (Baig et al., 2022). The reluctance to share knowledge and experiences, both formally and informally, points to a gap in a critical driver

for IWB and team collaboration (Phung et al., 2019). This finding highlights the need for an increased focus on middle management to serve as role models in all aspects, particularly in feeling empowered to lead by example and inspire their teams, based on a pre-survey conducted with 40 middle management respondents in the non-metallic mineral products manufacturing industry in December 2023.

The scholarly examination of IWB has predominantly concentrated on the contributions of lower-level employees, as highlighted by Caniëls and Veld (2016) and De Jong and Den Hartog (2010). Despite this focus, a discernible gap emerges in the literature regarding the exploration of IWB among middle management. This cohort is instrumental in the facilitation of organizational innovation, serving as a pivotal link between the strategic intentions of top management and the execution tasks performed by lower-level staff (Chen et al., 2018; Mustafa et al., 2016; Tarakci et al., 2023). Due to their decision-making capabilities, middle managers are ideally positioned to spearhead the ideation and resource allocation necessary to foster IWB (Mustafa, Hughes et al., 2022). Despite some studies examining the effects of organizational practices on IWB among middle management (Chen et al., 2018), investigations into the mediation of IWB at the individual level among middle management remain limited in scope (Bak, 2020; Mustafa, Badri et al., 2022).

Adding complexity to the discourse, scholarly works have revealed inconsistent results concerning the mediating role of job crafting (JC) in the interplay between transformational leadership (TL) and IWB. Esteves and Pereira Lopes (2016) reported a lack of significant influence from TL on JC. This finding echoes through later research, thus challenging the assumed universal efficacy of JC as a mediator. Moreover, Uen et al. (2021) highlighted the absence of a direct significant relationship between JC and IWB, further complicating the understanding of JC's role in facilitating IWB. Conversely, Humayun et al. (2022) found JC to have an insignificant mediating effect between the specified independent and dependent variables, contrasting with Anser et al. (2021), who detected a partial mediating effect of JC on the relationship between leadership and IWB. These conflicting observations point to an urgent gap in research, emphasizing the need for a more detailed exploration of the situational factors that might influence JC's effect on IWB, especially within the context of middle management.

The non-metallic mineral products industry's selection as the study's focus is motivated by its significant growth, particularly a 7.2% increase in the third quarter of 2023 (Yogatama, 2023). This indicates a dynamic and adaptive industry. This sector's also considerable economic impact, according to mae & CNBC Indonesia (2023), in terms of job creation and contributions to the national GDP, coupled with

the challenges of balancing efficiency and sustainability amidst growing demands, underscores the need for continuous innovations and effective work practices.

This paper aims to contribute to the current scientific discourse on TL by examining its interactive role in fostering IWB. Specifically, this research on Indonesia's non-metallic mineral products industry aims to provide new insights into IWB dynamics, especially among middle management, through a quantitative study. By examining the impact of TL on IWB and integrating factors such as knowledge sharing and JC, the study seeks to enrich the literature and offer practical management strategies to enhance innovations in this crucial industry sector.

Based on the above considerations, the focus of our research is: first, to examine how TL interacts to stimulate IWB, taking into account the moderating roles of knowledge-sharing behavior (KSB) and JC. Second, it will extend the social exchange theory (SET) framework by incorporating the role of TL in promoting IWB, specifically at the middle management level. Third, it will develop a research model that illustrates the interplay between TL and the moderating effects of KSB and JC in encouraging IWB. Fourth, it will analyze whether the impact of KSB and JC varies with the boundary conditions of TL and IWB.

This paper is structured as follows: Section 1 introduces the topic, setting the stage for the subsequent discussions. Section 2 offers an in-depth literature review and model development. The first subsection focuses on the interrelationship between TL, JC, KSB, and IWB. The second subsection outlines the mediating roles of knowledge sharing, and the third subsection outlines the mediating roles of JC. Section 3 outlines the research methodology, detailing the sample selection, data collection, measurements, and analysis. Section 4 presents the research findings, including the summary statistics, structural models, and validation of the hypotheses. Section 5 discusses these findings in detail, addressing the contributions and implications. Section 6 delineates the study's practical implications, providing actionable recommendations for practitioners. Finally, Section 7 concludes the paper by summarizing the key insights, limitations, and avenues for further research.

2. Literature review

2.1. Transformational leadership and innovative work behavior through the lens of social exchange theory

TL promotes a symbiotic culture that boosts top and middle management's moral standards and performance by fostering mutual benefits and growth, leading to organizational success (Afsar et al., 2019). This leadership style is con-

trasted with transactional leadership, focusing on empowerment rather than compliance, which motivates employees to exceed their prior achievements and contribute innovatively (Biancardi et al., 2021; Widodo & Mawarto, 2020). Researchers note that transformational leaders inspire innovation by setting exemplary behaviors that followers aspire to emulate, encouraging creative thinking and risk-taking (Akram et al., 2016; Michaelis et al., 2009). Such leaders stimulate intellectual engagement, support ethical behavior, and are responsive to followers' needs, thus enhancing innovative behavior and allowing employees to question norms and approach problems from new perspectives (Afsar et al., 2019; Gashema, 2021).

In examining workplace social interactions, the SET emerges as a crucial theoretical framework for understanding leader-employee dynamics (Afsar et al., 2019). This theory illuminates how reciprocal interactions form the basis of workplace behaviors, highlighting the complex exchange processes between leaders and their subordinates (Gashema, 2021). Through this lens, the mutual exchange between top and middle management is seen as foundational in fostering an environment that promotes IWB among employees.

2.2. The interrelationship between transformational leadership, job crafting, knowledge-sharing behavior, and innovative work behavior

TL propels team members toward unified objectives through four principal behaviors: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration, as outlined by Bak et al. (2021) and Avolio (1999). These behaviors not only inspire but also creatively engage and personally attend to the needs of followers. JC, defined as the self-initiated changes employees make to their work scope and relationships to align with their preferences (Baig et al., 2022), is significantly influenced by TL. TL drives adaptability and meaningful work by aligning tasks with individual capabilities and aspirations (Afsar et al., 2019; Wang et al., 2017). It fosters a supportive environment encouraging employees to craft their jobs, enhancing structural and social job resources and reducing barriers to personal growth. This dynamic underscores TL's role in promoting engagement and innovation by empowering employees to tailor their job roles. This leads to the hypothesis of a positive link between TL and JC (Afsar et al., 2019). In light of these considerations, the present research advances the hypothesis:

H1: TL significantly and positively influences employee JC.

KSB involves the disseminating and exchanging ideas, information, and expertise among team members, significantly contributing to innovation and organizational growth (Afsar et al., 2019; Chen et al., 2021). This process includes knowledge collection, gaining insights from others, and knowledge donating, sharing one's expertise, despite potential cost implications (Chen et al., 2021). Edwards et al. (2017) emphasized the importance of exchanging tacit and explicit knowledge to foster innovation. TL enhances this sharing by motivating, intellectually engaging, and valuing employees, thereby cultivating a culture where knowledge freely circulates, supporting innovation (Wang & Howell, 2010). Such leadership encourages trust, open communication, and a commitment to new ideas, as stated by Al-Husseini et al. (2019), while also making it instrumental in promoting KSB across an organization, thus facilitating the development of innovative solutions (Afsar et al., 2019). Based on the above arguments, this research develops the hypothesis:

H2: TL significantly and positively influences employees' KSB.

TL is a leadership style that inspires and motivates employees to transcend their self-interest for the organization's good and to achieve beyond what is generally expected of them (Karimi et al., 2023). Through coaching, advising, and motivation, this leadership approach enhances followers' skills and encourages the adoption of innovative methods (Al-Husseini et al., 2019). It significantly influences followers' achievements, motivation, and self-growth, contributing to increased IWB (Al-Husseini et al., 2019). Based on the above arguments, this study develops the hypothesis:

H3: TL significantly and positively influences employees' IWB.

The JC theory posits that employees who proactively adjust their job roles, tasks, and interactions can significantly enhance job fulfillment and engagement, as outlined by Afsar et al. (2019) and Petrou et al. (2012). This self-initiated modification process encompasses acquiring additional resources, embracing challenges, and reducing hindering job demands, thus enabling individuals to align their job roles more closely with their personal capabilities and aspirations. Such autonomy not only optimizes resource utilization but also encourages creativity and innovation in task performance (Afsar et al., 2019; Baig et al., 2022). Consequently, JC enables individuals to adapt their work environment to their strengths and preferences, which, in turn, enhances motivation and cultivates the generation of innovative ideas and practices. This activity is posited to significantly bolster IWB by allowing for the customization of job roles and fostering an environment conducive to innovation through the strategic realignment of job demands and resources (Afsar et al., 2019; Baig et al., 2022). Based on these arguments, this study puts forward the following hypothesis:

H4: JC significantly and positively influences employees' IWB.

Knowledge sharing behavior (KSB) delineates the degree to which employees participate in disseminating knowledge within their organization, serving as a catalyst for IWB, which involves generating, advocating, and executing new ideas (Phung et al., 2019). This relationship hinges on knowledge exchange fostering innovation by sparking new ideas and solutions (Phung et al., 2019). The act of sharing knowledge not only bolsters interpersonal connections but also aids in problem-solving and adapting to changes, thus laying a fertile ground for innovation (Choi et al., 2016; Sudibjo & Prameswari, 2021). Afsar et al. (2019) and Lin et al. (2018) emphasized KSB's role in promoting a continuous knowledge flow, thereby enhancing organizational and individual innovation capabilities. This interplay between KSB and IWB suggests a direct positive impact of knowledge sharing on fostering innovative behaviors within organizations (Phung et al., 2019; Sudibjo & Prameswari, 2021). Based on the above arguments, this study posits the hypothesis:
H5: KSB significantly and positively influences employees' IWB.

2.3. Transformational leadership and innovative work behavior: Knowledge-sharing behavior as a mediator

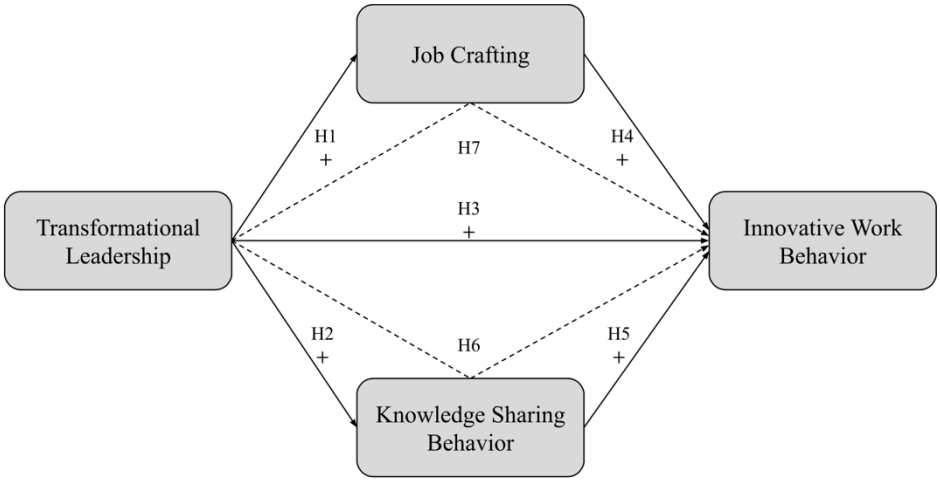
KSB is identified as a mediator between TL and IWB (Sudibjo & Prameswari, 2021). Transformational leaders promote a culture of knowledge sharing among their followers through idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration, ultimately generating new ideas and fostering employees' IWB (Phung et al., 2019). TL is positively related to knowledge sharing, which, in turn, is positively related to innovation (Al-Husseini et al., 2019). This suggests that transformational leaders indirectly facilitate IWB among their followers by encouraging knowledge sharing. Based on the above arguments, this study proposes the following hypothesis:
H6: KSB mediates the relationship between TL and IWB.

2.4. Transformational leadership and innovative work behavior: Job crafting as a mediator

Transformational leaders inspire and motivate followers to exceed expectations and engage in innovative activities (Afsar et al., 2019). They encourage employees to change their job boundaries proactively, an essential aspect of job creation, including modifying tasks and relational aspects to make their work

more meaningful, engaging, and satisfying (Baig et al., 2022). JC mediates the influence of TL on employees' IWB. As employees engage in JC, they reshape their work environment to be more conducive to innovation (Baig et al., 2022). Based on the findings of Afsar et al. (2019), TL significantly and positively influences employees' IWB, mediated by JC behavior, indicating that transformational leaders drive employees to exceed their call of duty through motivation, which in turn fosters JC behavior in supporting IWB (Baig et al., 2022). Based on the above arguments, this study suggests the following hypothesis:
H7: JC mediates the relationship between TL and IWB.

Figure 1. Theoretical framework



Source: Kamal's own elaboration.

The theoretical framework shown in Figure 1 above was developed in line with developed research hypotheses. In the model in Figure 1, each of the H1, H2, H3, H4, and H5 relationships shows direct relationships, while H6 and H7 depict indirect relationships (mediating variable).

3. Research methodology

3.1. Methods, samples, and data collection

This study employed a deductive research approach, focusing on the non--metallic minerals industry in Indonesia. A cross-sectional survey targeted middle management personnel, such as supervisors and assistant managers, to explore

the relationships between variables. Purposive sampling was utilized to select the participants. Following the guidelines proposed by Hair et al. (2016), the sample size was determined to maintain a 15:1 to 20:1 observation-to-variable ratio, necessitating a minimum of 237 respondents for the four study variables. This approach ensured the reliability and validity of the outcomes from the multivariate data analysis (Hair et al., 2016). The data collection was facilitated through an online survey distributed among professionals within the specified sector, to gather pertinent insights and validate the proposed hypotheses.

3.2. Measurement

All constructs in this study were measured using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree), with items adapted from previous research. The specific items for each construct are presented in the Appendix.

This study measured TL with a 20-item questionnaire developed by Afsar et al. (2019), where the subordinates evaluated their direct superiors' behavior, e.g., "My leader emphasizes clear and strong goals."

Janssen (2000) outlined IWB as a process with three key phases: generating, promoting, and implementing these ideas. The initial phase, generating ideas, is about developing innovative and practical concepts across different areas. Phung et al. (2019) provided an example: "I constantly seek new methods and work techniques." This foundational step is critical for initiating the innovative process within organizations.

In this study, JC behavior was measured using a 15-item scale by Afsar et al. (2019), encompassing three dimensions: increasing structural job resources, improving social job resources, and upgrading challenging job demands. An example item for structural job resources is "I strive to improve my skills." For social job resources, an example is "I frequently ask for advice from my colleagues." Regarding challenging job demands, an example item is "I often use my free time to start new tasks."

KSB is measured using five items adapted from Phung et al. (2019), including "I actively share knowledge in my workplace."

3.3. Data analysis

This study employed the partial least squares structural equation modeling (PLS-SEM) approach, facilitated by SmartPLS 4 software, for data analysis and hypothesis testing, aligning with the methodologies outlined by Ringle et al.

(2018) and Hair et al. (2019). PLS-SEM proves to be suitable for analyses involving small sample sizes and has the capacity to yield higher statistical power compared to covariance-based SEM (CB-SEM). It proves particularly adept at managing non-normal data distributions. This methodology maximizes the explained variance in dependent constructs, such as IWB, thereby enhancing predictability and contributing to theoretical development. The exploratory nature of PLS-SEM is well-suited for examining the intricate relationships among TL, JC, knowledge sharing, and IWB, encompassing four constructs and 49 items. The analytical process unfolds in two critical stages: assessing the measurement model for reliability and validity and evaluating the structural model to ascertain the relationships among constructs. This ensures a thorough analysis of direct and mediated relationships within the innovation and leadership framework.

4. Research findings

4.1. Research sample characteristics

This study's respondent characteristics are summarized in Table 1 as follows. Out of 237 respondents, the majority were male (154 or 65%). Females represented 35% of the total, with 83 respondents. The largest age group was 30-39 year-olds with 197 respondents (83%), followed by 40-49 year-olds (23 or 10%), and 20-29 year-olds (17 or 7%). Regarding education, most respondents held a bachelor's degree (207 or 87%), 11% had a master's degree (27 respondents), while diploma and PhD level holders were minimal.

Table 1. Profiles of the valid respondents

Characteristic	Category/Type	Frequency	Percentage
Gender	Male	154	65%
	Female	83	35%
Age	20-29	17	7%
	30-39	197	83%
	40-49	23	10%
Education	Diploma 1-3	2	1%
	D4 or S1	207	87%
	S2	27	11%
	S3	1	1%
Tenure	≤ 5	7	3%
	6-10	206	87%
	11-15	24	10%
Job level	Supervisor	202	85%
	Associate manager	35	15%

Source: Kamal's own elaboration.

Regarding employment status, permanent employees predominated with 214 individuals (90%), and permanent contract employees totaled 23 individuals (10%). A significant portion, 206 respondents (87%), had 6 to 10 years of work experience, and 24 respondents (10%) worked 11 to 15 years, with only 7 respondents (3%) having less than 5 years of experience. At the job level, 202 respondents (85%) were supervisors, and 35 respondents (15%) were associate managers, totaling 237 respondents for this study, fulfilling 100% of the targeted sample.

4.2. Results of the summary statistics

This study conducted tests to ensure the measurement tools were reliable and valid. For reliability, Cronbach's alpha (α) and composite reliability (CR) above 0.7 indicate reliability. The data in Table 2 show that all the constructs exceeded this threshold, with Cronbach's alpha ranging from 0.806 to 0.955 and the CR from 0.866 to 0.959, indicating excellent reliability.

Table 2. Measurement model

Construct/Item	Loading	M	SD	AVE	CR	α
1	*2*	*3*	*4*	*5*	*6*	*7*
TL	–	–	–	0.539	0.959	0.955
TL1	0.762	2.743	1.161	–	–	–
TL2	0.795	2.734	1.152	–	–	–
TL3	0.758	2.662	1.217	–	–	–
TL4	0.750	2.814	1.140	–	–	–
TL5	0.760	2.684	1.175	–	–	–
TL6	0.717	2.624	1.197	–	–	–
TL7	0.744	2.603	1.167	–	–	–
TL8	0.778	2.629	1.262	–	–	–
TL9	0.669	2.671	1.226	–	–	–
TL10	0.700	2.591	1.168	–	–	–
TL11	0.779	2.688	1.234	–	–	–
TL12	0.698	2.722	1.179	–	–	–
TL13	0.606	2.789	1.346	–	–	–
TL14	0.703	2.726	1.245	–	–	–
TL15	0.763	2.650	1.263	–	–	–
TL16	0.689	2.814	1.312	–	–	–
TL17	0.742	2.764	1.127	–	–	–
TL18	0.730	2.591	1.224	–	–	–
TL19	0.758	2.671	1.216	–	–	–
TL20	0.754	2.734	1.173	–	–	–
JC	–	–	–	0.509	0.939	0.934
JC1	0.722	2.578	1.147	–	–	–
JC2	0.691	2.523	1.168	–	–	–

Table 2 cont.

1	*2*	*3*	*4*	*5*	*6*	*7*
JC3	0.780	2.540	1.171	–	–	–
JC4	0.822	2.633	1.160	–	–	–
JC5	0.824	2.392	1.145	–	–	–
JC6	0.685	2.764	1.192	–	–	–
JC7	0.688	2.726	1.189	–	–	–
JC8	0.610	2.705	1.252	–	–	–
JC9	0.716	2.595	1.116	–	–	–
JC10	0.786	2.633	1.231	–	–	–
JC11	0.690	2.553	1.230	–	–	–
JC12	0.628	2.536	1.156	–	–	–
JC13	0.618	2.624	1.193	–	–	–
JC14	0.641	2.658	1.231	–	–	–
JC15	0.753	2.578	1.063	–	–	–
KSB	–	–	–	0.566	0.866	0.806
KSB1	0.860	3.295	1.298	–	–	–
KSB2	0.763	3.122	1.295	–	–	–
KSB3	0.741	3.236	1.152	–	–	–
KSB4	0.695	3.203	1.313	–	–	–
KSB5	0.692	3.152	1.360	–	–	–
IWB	–	–	–	0.630	0.939	0.927
IWB1	0.813	3.920	1.050	–	–	–
IWB2	0.804	3.768	1.129	–	–	–
IWB3	0.771	3.717	1.270	–	–	–
IWB4	0.791	3.907	1.125	–	–	–
IWB5	0.794	3.852	1.098	–	–	–
IWB6	0.788	3.654	1.208	–	–	–
IWB7	0.791	3.684	1.131	–	–	–
IWB8	0.778	3.658	1.221	–	–	–
IWB9	0.812	3.865	1.075	–	–	–

Source: Kamal's own elaboration.

In particular, the TL construct demonstrated a CR value of 0.959, surpassing the conventional threshold of 0.95 (Hair et al., 2019). According to Hair et al. (2019), CR values above 0.95 can indicate potential redundancy among items, potentially reducing the construct validity. Despite this, it is essential to retain all indicators of TL in our model due to their critical role in capturing the comprehensive nature of TL. The dimensions of TL individualized consideration, inspirational motivation, intellectual stimulation, and idealized influence are conceptually distinct yet inherently interrelated (Longshore, 1987).

Bass and Avolio (1994) emphasized that transformational leaders exhibit behaviors spanning all dimensions, reinforcing each other. This integrative approach is crucial for a holistic understanding of TL and justifies the inclusion of all indicators. Previous studies have highlighted similar interconnectedness in

TL dimensions (Khan et al., 2020; Avolio, 1999). Empirical evidence supports this decision, as our measurement model was rigorously tested for convergent and discriminant validity. Convergent validity was confirmed with average variance extracted (AVE) values greater than 0.5, affirming that items within each construct are interrelated and measure the same concept (Hair et al., 2019). Specifically, the AVEs ranged from 0.509 to 0.630, demonstrating strong convergent validity across all constructs.

The discriminant validity present in Table 3 was evaluated using the heterotrait-monotrait (HTMT) ratio, with a threshold of 0.90 deemed acceptable (Hair et al., 2019). In this study analysis, all HTMT values were found to be below this benchmark, indicating apparent distinctiveness and differentiation among the constructs. Additionally, assessing the HTMT ratio for our constructs and identifying values below the more stringent threshold of 0.85 for conceptually distinct constructs, as recommended by Hair et al. (2021), further substantiates that the high CR does not signify redundancy but rather robust internal consistency. This rigorous approach reinforces the validity of our measurement model and supports the comprehensive nature of our constructs.

Table 3. Discriminant validity through HTMT

Constructs	Innovative work behavior	Job crafting	Knowledge sharing behavior	Transformational leadership
IWB	–	–	–	–
JC	0.118	–	–	–
KSB	0.340	0.407	–	–
TL	0.336	0.121	0.504	–

Source: Kamal's own elaboration.

Furthermore, within the context of middle management in the non-metallic minerals manufacturing sector, the high CR value reflects the intricate nature of TL. Middle managers in this sector likely exhibit a comprehensive leadership style that integrates all dimensions of TL to address the unique challenges of their industry. This sector requires leaders who can inspire, intellectually stimulate, and individually consider their team members while maintaining an idealized influence. The high CR value thus indicates that the respondents consistently perceive these interrelated dimensions as part of a unified leadership approach, essential for their roles. Therefore, despite the CR exceeding 0.95, the theoretical rationale and empirical evidence support the retention of all indicators, affirming the construct's validity and relevance in this specific context. This further supports the robustness and validity of our measurement model, effectively measuring constructs such as IWB, JC, KSB, and TL for further analysis.

4.3. Structural model

Table 4 shows the results of the variance inflation factor (VIF) for each exogenous variable within the regression model, explicitly examining the constructs of IWB, JC, and KSB. The VIF values serve as a quantifier of the increase in the variance of an estimated regression coefficient caused by collinearity.

Table 4. Multicollinearity test results

Exogenous variable	VIF		
	IWB	JC	KSB
TL	1.255	1.000	1.000
JC	1.204	–	–
KSB	1.404	–	–

Source: Kamal's own elaboration.

The reported VIF values for TL on IWB (1.255), JC (1.000), and KSB (1.000) indicate minimal inflation of variance. Similarly, the VIF values for JC (1.204) and KSB (1.404) for IWB fall well below the commonly accepted threshold, suggesting a lack of multicollinearity. According to Hair et al. (2019), a VIF value exceeding 5 could indicate multicollinearity concerns; however, all VIF values reported in the table are significantly lower. This result infers that the regression coefficients estimated for these variables are reliable and not unduly influenced by multicollinearity.

Table 5. Coefficient determinant test results

Coefficient determinant test results	
Variable	R-square
IWB	0.150

Source: Kamal's own elaboration.

The coefficient of determination, as presented in Table 5 for the variable IWB, stands at 0.150. This statistical metric implies that the independent variables encapsulated within the model account for 15% of the variability observed in IWB. The R-squared values reflect the model's predictive capability, with Hair et al. (2019) suggesting thresholds of 0.75, 0.5, and 0.25 for high, moderate, and low prediction accuracy, respectively. An R-square of 0.150 denotes a moderate explanatory capacity, signifying that the model's variables exert a discernible, albeit not exhaustive, influence on IWB. Consequently, a significant 85% of the variation in IWB is attributable to factors beyond the current model's scope. This underlines the presence of additional, unaccounted-for elements that critically influence IWB, suggesting a multifaceted and intricate array of drivers

underpinning innovative behavior within the context of middle management in the non-metallic minerals manufacturing sector.

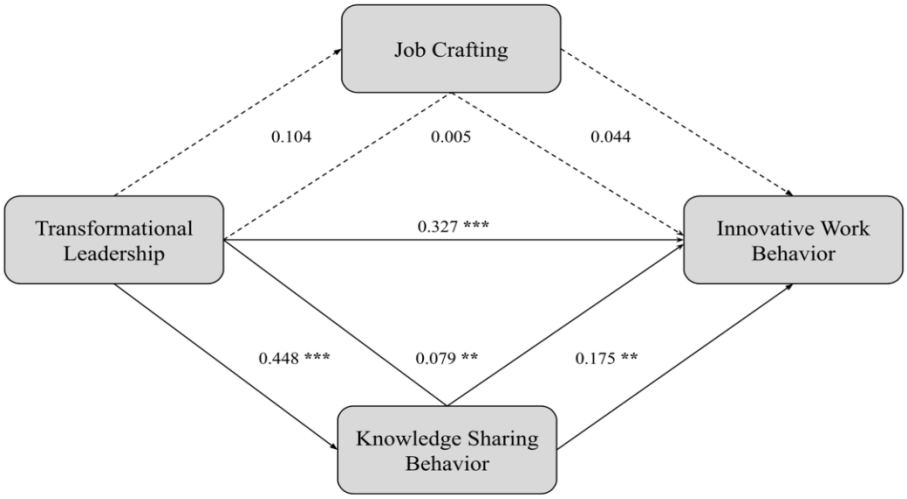
Table 6. Hypothesis testing results

Hypothesis	Path	(β)	(M)	STDEV	T statistic	P value	Decision
H1	TL → JC	0.104	0.113	0.119	0.879	0.190	Not supported
H2	TL → KSB	0.448	0.455	0.044	10.151	0.000	**Supported**
H3	TL → IWB	0.327	0.334	0.038	8.589	0.000	**Supported**
H4	JC → IWB	0.044	0.062	0.077	0.570	0.284	Not supported
H5	KSB → IWB	0.175	0.172	0.072	2.425	0.008	**Supported**
H6	TL → KSB → IWB	0.079	0.078	0.033	2.377	0.009	**Supported**
H7	TL → JC → IWB	0.005	0.009	0.012	0.368	0.356	Not supported

Source: Kamal's own elaboration.

In this study framework, bootstrapping with 5,000 replications revealed significant insights into the effects of TL on IWB through KSB and JC. As seen in Table 6 and the schematic representation of the relation between variables in Figure 2, it highlights the finding of H1, which proposed that TL would positively impact JC, was not supported ($\beta = 0.104$, $p = 0.190$). Conversely, H2 posited a substantial positive effect of TL on KSB, which was strongly supported by our analysis ($\beta = 0.448$, $p < 0.001$). This suggests that TL is a significant predictor of KSB within organizations. In further examining the role of TL, H3 indicates a positive influence on IWB, which was also supported ($\beta = 0.327$, $p < 0.001$). This finding reinforces the notion that TL can effectively foster innovative behavior in the workplace.

Figure 2. The structural model with path coefficients



Note: ** $p < 0.01$; *** $p < 0.001$. The dotted line shows an insignificant relationship.

Source: Kamal's own elaboration.

However, the direct influence of JC on IWB (H4) was not supported ($\beta = 0.044$, $p = 0.284$), indicating that JC may not be a significant direct contributor to IWB within this study's framework. In contrast, KSB's effect on IWB (H5) was supported ($\beta = 0.175$, $p = 0.008$), highlighting the importance of knowledge sharing as a precursor to innovative behavior. An additional path analyzed was the indirect effect of TL on IWB through KSB (H5), which was found to be significant ($\beta = 0.079$, $p = 0.009$). This underscores the mediating role of KSB in the relationship between TL and IWB. Lastly, the hypothesized path from TL through JC to IWB (H6) was not supported ($\beta = 0.005$, $p = 0.356$), suggesting that the pathway from TL to IWB does not significantly pass through JC in the context of middle management within the non-metallic mineral manufacturing sector.

In essence, the result delineates the complex interplay between TL and its varying impacts on JC, knowledge sharing, and IWB. It reveals that TL has a salient influence on KSB and IWB but not directly on JC.

5. Discussion

This research endeavor aimed to scrutinize the influence of TL on middle management's IWB within the non-metallic minerals manufacturing sector, with a particular emphasis on the roles of JC and KSB. Although the study's findings were insightful, they indicated that our model captured only a fragment of the variances in IWB. This suggests the presence of additional, unexplored factors that may influence IWB, such as leadership dynamics, team interactions, and individual idiosyncrasies. Therefore, there is an imperative need for future research to refine the assessment of IWB within this industrial context and to elucidate the complex tapestry of elements that drive workplace innovation.

Within the framework of the SET, TL plays a pivotal role in fostering an environment that promotes IWB through KSB. According to Cropanzano and Mitchell (2005), SET posits that social exchanges in the workplace are built on the reciprocal trade of socioemotional resources, such as support, recognition, and empowerment, which fulfill social and esteem needs. Transformational leaders provide these socioemotional resources by recognizing and valuing their employees, creating a supportive environment conducive to innovation. This aligns with the findings of Cropanzano and Mitchell (2005), who highlighted that socioemotional outcomes, such as feeling valued and respected, are critical for enhancing employees' intrinsic motivation and creativity. When employees perceive high levels of socioemotional support from their leaders, they are more likely to reciprocate with behaviors beneficial to the organization, including increased knowledge sharing and proactive engagement in innovative activities.

IWB can be more deeply understood by examining influential theoretical perspectives and models across the creativity and innovation literature (Anderson et al., 2014). Bledow et al. (2009a, 2009b) advocated for the ambidexterity theory to explain the process of managing conflicting demands at multiple organizational levels to innovate successfully. Ambidexterity refers to the ability of a complex and adaptive system to manage and meet conflicting demands by engaging in fundamentally different activities, such as exploration (innovation) and exploitation (efficiency) (Anderson et al., 2014). This duality is crucial for organizations aiming to innovate while maintaining operational efficiency. Transformational leaders are adept at managing these dual demands by encouraging innovative thinking (exploration) while ensuring that current operations run smoothly (exploitation) (Wahyuningtias & Nugroho, 2023; Zuraik & Kelly, 2019).

This balance is supported by the principles of SET, where leaders and followers engage in reciprocal exchanges that benefit both parties. By providing socioemotional resources, transformational leaders facilitate a dynamic environment where employees feel valued and empowered to innovate (Amankwaa et al., 2019). This dynamic is crucial for balancing the dual demands of exploration and exploitation, ensuring that the organization remains innovative and efficient. Bledow et al. (2009a) distinguished between active management and self--regulatory processes for integrating activities performed by subsystems or at different points in time, highlighting the importance of both approaches in fostering innovation (Bledow et al., 2009b).

Middle management plays a critical role in this process, acting as a bridge between strategic and operational levels within the organization. Middle managers mediate, negotiate, and interpret connections between the organization's institutional (strategic) and technical (operational) levels, linking vertically related groups and connecting the overall direction provided by top managers with the day-to-day reality of lower-level managers (Floyd & Wooldridge, 1997). Their upward influence activities, such as interpreting ambiguous data and championing new initiatives, have the potential to alter the firm's strategic course by providing top management with unique insights and proposals for new initiatives (Floyd & Wooldridge, 1997; Wooldridge et al., 2008).

In their downward influence role, middle managers act as change agents, fostering adaptability and implementing deliberate strategies. They stimulate development and promote learning, increasing the organization's ability to respond to change (Nonaka, 1994). By engaging in continuous interventions, middle managers align organizational actions with strategic objectives, ensuring the organization remains responsive to its external environment (Floyd & Wooldridge, 1997).

The connection between TL and KSB is particularly significant. Through their inspirational and supportive behavior, transformational leaders encourage employees to share knowledge freely, fostering a culture of continuous learning and improvement (Cropanzano & Mitchell, 2005). This knowledge-sharing is a crucial component of IWB, as it facilitates the exchange of ideas and the collaborative development of new solutions.

Aligning with the existing literature (Khan & Khan, 2019; Paksoy et al., 2019; Sudibjo & Prameswari, 2021), our study corroborates the pivotal role of TL in enhancing KSB. This reinforcement of the positive relationship between TL and KSB underscores the capacity of transformational leaders to foster a climate conducive to collaboration and the free flow of innovative ideas. Enhancing KSB under the auspices of TL is critical, as it catalyzes more effective knowledge dissemination, which can accelerate innovation and strengthen the organization's learning capabilities – elements indispensable for sustained success and competitive advantage.

Furthermore, the findings validate the direct and positive impact of TL on IWB, resonating with contributions from Afsar et al. (2019), Sudibjo and Prameswari (2021), and Karimi et al. (2023). Such a leadership style, characterized by its ability to inspire and stimulate, is crucial in fostering innovation within the workforce. Leaders who articulate a clear vision and actively support employee innovation initiatives are integral to enabling middle management to surpass standard performance benchmarks and devise creative solutions. The implications for leadership development are profound; promoting a TL style could benefit not only immediate performance outcomes but also enhance the organization's long-term innovation capacity, underscoring the critical function of leaders in unlocking the innovative potentials of their employees.

The significant influence of KSB on IWB reaffirms the theoretical proposition that knowledge dissemination is a cornerstone of innovation. This study's findings resonate with Phung et al. (2019), reinforcing the premise that KSB acts as an engine driving the creation and implementation of novel ideas within organizations. However, although significant, the pathway from TL to IWB through KSB unveils a layered interaction, suggesting that TL may facilitate KSB in a manner that indirectly augments innovation. Such intricacy warrants a deeper investigation to unpack the dynamics of how TL enhances KSB, fostering an environment conducive to IWB.

Our study contributes to the ongoing discourse on the impact of TL on JC, confirming Esteves and Pereira Lopes (2016) and Marcellino and Pujianto's (2022) findings that TL does not significantly influence JC directly. This contrasts with Afsar et al. (2019), who observed a notable correlation, underscoring

the need to explore further the dynamics underlying this relationship. Our results suggest that TL may instead indirectly facilitate JC through other mediators, which supports the notion that transformational leaders cultivate an environment promoting empowerment and motivation, which is essential for an engaged workforce to undertake JC (Marcellino & Pujianto, 2022) independently.

Additionally, employees' perception of TL plays a crucial role in how they engage in JC. Our findings indicate that employees may not see TL behavior as directly supportive of their role modification efforts, viewing JC as primarily an autonomous activity minimally influenced by direct leadership actions. Discrepancies across studies could be attributed to overlooked factors like psychological empowerment and individual proactivity, highlighting the necessity of incorporating these elements into future research models to enhance outcome accuracy (Esteves & Pereira Lopes, 2016). Contextual factors also significantly affect the TL-JC interplay, as demonstrated by the unique dynamics within the hospitality industry in Pakistan explored by Afsar et al. (2019). These findings emphasize the importance of considering organizational culture and sectorial contexts when evaluating the impact of leadership styles on employee behaviors, which is critical for developing effective leadership strategies that genuinely enhance JC.

Moreover, contextual factors play a significant role in shaping this relationship, as evidenced by Afsar et al. (2019) in their study of Pakistan's hospitality industry. These findings underscore the importance of considering organizational culture and sector-specific contexts when assessing the impact of leadership styles on employee behaviors. This is crucial for devising effective leadership strategies that foster JC. It is also essential to recognize the dual-edged nature of JC. Wrzesniewski and Dutton (2001) initially theorized that while JC can substantially benefit organizations, it can also lead to adverse outcomes. For instance, if employees' crafting efforts are misaligned with the organization's strategic objectives or lead to procrastination, JC can result in significant losses in terms of time and resources. In extreme scenarios, employees might engage in counterproductive behaviors that directly conflict with the organization's interests (Wrzesniewski & Dutton, 2001).

Petrou et al. (2012) further corroborated these conclusions, highlighting that although JC can enhance job satisfaction and engagement, it can also have detrimental effects if not aligned with the organizational goals. This underscores the necessity of understanding the specific contexts in which JC occurs and the strategies employees employ in their crafting efforts. Organizations must be aware of these potential pitfalls and develop mechanisms to guide and support employees in their JC endeavors to ensure alignment with broader organizational objectives.

The intricate relationship between TL and JC requires a nuanced understanding of how transformational leaders can support JC without inadvertently encouraging counterproductive behaviors. One effective approach involves transformational leaders providing clear guidance and support for JC activities that align with organizational goals. Leaders can mitigate the risks identified by Wrzesniewski and Dutton (2001) and Petrou et al. (2012) by fostering a culture of open communication and providing the necessary resources for effective JC. This ensures that JC not only enhances individual job satisfaction and engagement but also aligns with and supports the organization's strategic objectives.

Contextual factors also significantly affect the TL-JC interplay, as demonstrated by the unique dynamics within the hospitality industry in Pakistan explored by Afsar et al. (2019). These findings emphasize the importance of considering organizational culture and sectorial contexts when evaluating the impact of leadership styles on employee behaviors, which is critical for developing effective leadership strategies that genuinely enhance JC.

Recent research further illuminates that the relationship between JC and IWB is mediated by various factors rather than directly significant (Song & Jo, 2023). This diverges from earlier assertions by Afsar et al. (2019) of a direct impact, pointing to the need for acknowledging additional variables that could affect the efficacy of JC strategies in promoting innovation. Studies by Alwali (2023), Guo et al. (2022), and Novianti et al. (2023) emphasized the roles of psychological empowerment, inclusive leadership, and work engagement as crucial mediators, suggesting that nurturing an organizational culture that fosters empowerment, inclusive leadership, and engagement is essential for JC to drive innovation effectively. These insights underscore the complex nexus between JC and IWB and the conditional influences shaping this dynamic.

Our investigation within Indonesia's non-metallic mineral products industry demonstrates that JC exhibits an insignificant mediating effect on workplace outcomes. This aligns with findings by Humayun et al. (2022) in the textile sector, whereas Anser et al. (2021) observed partial mediation, and Afsar et al. (2019) reported significant effects in different settings. Such variances highlight the influence of specific industrial and cultural contexts on JC dynamics. The minimal impact of JC in our study can be attributed to the industry-specific management style prevalent in traditional manufacturing sectors, characterized by high work pressure and restricted employee autonomy (Humayun et al., 2022). This environment limits opportunities for JC, particularly in leveraging social resources, which are essential for its efficacy, as Tims and Bakker (2010) identified. Consequently, the rigid managerial approach and high workload may inherently suppress the potential for JC to influence employee outcomes significantly.

Finally, the cultural backdrop of Indonesia, described by Artina et al. (2020) as a collectivist society with high power distance, mirrors the autocratic management style observed in the industry, which Hofstede Insights quantifies with a power distance score of 78. Such a framework curtails individual initiatives like JC, where employees endeavor to modify their job roles and enhance support from colleagues. Zhang and Parker (2018) suggested that these conditions are unfavorable for fostering JC practices, as they do not encourage personal initiatives in adapting job structures. These findings collectively underscore the intricate and conditional influence of JC on IWB, necessitating a further exploration of the contextual factors that may facilitate or impede this process. The divergence in empirical evidence calls for a refined theoretical approach to understanding the mechanisms TL and JC interact, ultimately influencing IWB within various organizational settings.

6. Practical implications

This study presents substantial practical implications by highlighting the pivotal role of TL in enhancing IWB within the non-metallic minerals manufacturing sector. By integrating insights from prior research, it becomes evident that cultivating TL capabilities and fostering a culture of knowledge sharing are essential strategies for organizations seeking to boost innovation and maintain a competitive edge.

To foster an environment conducive to innovation, organizations should prioritize the development of TL skills to cultivate an environment conducive to innovation. Leadership training programs should emphasize participatory management styles, address individual employee needs, and enable leaders to articulate inspiring visions (Loong et al., 2023). These programs should incorporate comprehensive training modules, including group sessions and individual booster sessions with feedback and consultations, to ensure continuous improvements in leadership behaviors (Podsakoff et al., 1990). By exhibiting transformational qualities, leaders can create a work environment where employees feel valued and empowered to share their insights and ideas, fostering a collaborative and innovative workplace (Loong et al., 2023).

Furthermore, establishing a strategic vision that underscores knowledge sharing as a driver of innovation and competitive advantage is imperative. Top management must foster open communication and commit to continuous improvements to set the organizational tone effectively. Middle management, acting as the bridge between top management and operational staff, plays a critical

role in facilitating knowledge sharing by encouraging collaboration, providing platforms for information exchange, and recognizing valuable contributions (Humayun et al., 2022). This strategic vision should be communicated clearly across all organizational levels to ensure alignment and coherence in fostering an innovative culture.

Moreover, the human capital department should design and implement training programs to enhance employees' knowledge-sharing skills. Such programs should integrate mentoring, workshops, and collaborative projects, embedding knowledge sharing into daily routines (Nonaka, 1994). It is vital to consider cultural and contextual nuances, especially in environments with high power distance or collectivist values, to ensure that these programs are effective and culturally appropriate (Humayun et al., 2022). Moving away from traditional autocratic leadership styles and promoting inclusivity and empowerment are essential for creating a supportive environment that encourages innovation.

Significantly, the direct impact of TL on IWB is significant. Research indicates that TL can be developed through training and mentoring at all organizational levels, leading to substantial improvements in employees' innovative behaviors (Podsakoff et al., 1990). By creating an environment where employees are motivated to perform beyond expectations, transformational leaders can drive their teams to achieve remarkable levels of innovation (Podsakoff et al., 1990). This leadership approach involves not only fostering hope and self-efficacy among employees but also directly inspiring them to engage in innovative activities.

Additionally, knowledge sharing plays a crucial role in enhancing IWB. Knowledge transfer between knowledge providers and receivers involves not just the exchange of information but also the transformation and enrichment of knowledge through interactions (Nonaka, 1994). Implicit knowledge, deeply rooted in individual behavior and the environment, includes personal thinking modes, belief propositions, and mental models (Nonaka, 1994). Facilitating the exchange of such knowledge can significantly contribute to organizational innovation.

Collectively, integrating TL and knowledge-sharing practices is vital for organizations aiming to enhance IWB. By investing in leadership development and fostering a culture that values knowledge exchange, organizations can create an environment that supports continuous innovation and sustains a competitive advantage in the industry.

7. Conclusions

This study contributes significantly to the literature on leadership and IWB by offering several noteworthy insights. First, we extend the SET framework (Afsar et al., 2019) by elucidating the interplay between TL styles and the promotion of IWB among middle management. Second, this study advances the research on IWB by integrating the moderating roles of JC and knowledge sharing (Guo et al., 2022; Paksoy et al., 2019). Specifically, we examine how these moderating mechanisms impact the relationship between leadership and innovativeness across different organizational levels, drawing on the insights of Bak et al. (2021) and Sudibjo and Prameswari (2021). Finally, by linking TL theories with IWB, we address the call for further exploration of the positive outcomes of TL on individual performance, including enhanced self-efficacy and work engagement (Hendrastuti & Setiawan, 2021).

Furthermore, this study enhanced the SET by examining the dynamics between TL, JC, KSB, and IWB in Indonesia's non-metallic minerals manufacturing sector. As proposed by Homans (1958), SET explains reciprocal relationships in social contexts where actions benefit both parties. Recent applications of SET, such as Setyaningrum et al. (2024) on green HRM practices and Bagis et al. (2024) on reducing workplace deviant behaviors, demonstrated its broad applicability. Our research focused on how TL from top management affects IWB among middle management, unlike studies that focused on direct employee outcomes. By integrating TL as the independent variable and KSB and JC as mediators, this study showed how leadership fosters innovation through social exchanges in promoting knowledge sharing and JC among middle management.

The study highlighted TL's critical role in enhancing IWB through effective knowledge sharing. Unlike studies in non-manufacturing contexts where knowledge sharing supports broader goals Gao and Bernard (2017), this research focused on operational efficiency and innovation in manufacturing. It examined how middle management bridges knowledge sharing initiated by top management's TL, emphasizing the strategic use of knowledge sharing to prevent defects and boost innovation. Additionally, JC in Indonesia's regulated non-metallic mineral sector has distinct characteristics compared to more autonomous sectors (Ritz et al., 2024). Studies like Kristiana et al. (2024) showed JC's effectiveness in service industries, but its impact in manufacturing, especially under strict SOPs and hierarchical cultures, is less evident. Our findings suggest TL does not directly foster JC among middle management, unlike in less formal environments (Afsar et al., 2019), indicating a need for targeted strategies in aligning JC with organizational goals.

Moreover, the study reveals that JC does not mediate the nexus between TL and IWB in Indonesia's non-metallic mineral industry, contrasting with other industries and cultural settings (Humayun et al., 2022). This discrepancy underscores the need for theoretical models to consider industrial and cultural contexts when examining the TL, JC, and IWB relationships. While TL, mediated by KSB and JC, explains some variability in IWB, significant factors remain unexplored. Other influences, such as external and internal organizational dynamics, likely shape innovation within middle management. This study underscores JC's complex and conditional influence on IWB, highlighting the need for a refined theoretical approach to understand TL and JC's interactions, ultimately impacting IWB. By contributing to the discourse on TL's impact on JC and KSB, this study encourages further research to uncover additional variables and refine models for better applicability across different industries and cultural contexts.

Despite these contributions, several limitations necessitate future research suggestions to build a more comprehensive understanding of this relationship. One primary limitation is that the current model accounts for only a fraction of the variance in IWB, indicating that other influential factors are not captured. Potentially significant variables such as leadership dynamics, team interactions, and individual differences should be incorporated in future studies. These factors could offer a more nuanced understanding of the determinants of IWB across various organizational contexts and industry settings. Future research should aim to develop and test models that include a broader array of variables to explain the variance in IWB better.

Another limitation stems from the reliance on self-reported data, which can introduce biases such as the social desirability bias (Caputo, 2017). At the same time, self-reported data can capture a wide range of behaviors (Hernaus et al., 2019). The accuracy and objectivity of the findings may be compromised. Although efforts were made to mitigate the common method bias by collecting data at different points in time for independent and dependent variables (Grošelj et al., 2020), future studies should incorporate multi-sourced data. Including peer and supervisor assessments could enhance the reliability and validity of the findings (Hoffman & Woehr, 2009). Such multi-source data would provide a more holistic and accurate representation of the behaviors and dynamics being studied.

The study's exclusive focus on JC and KSB as mediators also presents a limitation. By not considering other potential mediators, such as psychological capital and organizational support, the study may overlook critical mechanisms through which TL influences IWB. Expanding the scope to include these additional mediators could provide a deeper understanding of the pathways linking TL to IWB. Additionally, examining moderators, such as the alignment of em-

powerment expectations between leaders and followers (Humborstad & Kuvaas, 2013), could offer more comprehensive insights into the dynamics of TL's impact on IWB. Future research should investigate a broader range of mediators and moderators to capture the complex interplay of factors that influence IWB.

The cross-sectional design of this study limits the ability to establish causality between TL, JC, and IWB (Anser et al., 2021). Future research should employ longitudinal and experimental designs to clarify these causal relationships. Longitudinal studies, in particular, could elucidate how different dimensions of TL influence JC and IWB over time (Karimi et al., 2023; Phung et al., 2019). Researchers can better understand the temporal dynamics and causal pathways involved by tracking changes and developments in these variables. Furthermore, the study's focus on a single leadership style, TL, restricts the generalizability of the findings. Investigating the effects of other leadership theories, such as ethical and transactional leadership, can provide a more nuanced understanding of how different leadership styles impact IWB (Anderson et al., 2014). Future research should compare multiple leadership styles to determine their relative effectiveness in fostering IWB across various contexts and industries.

Employing a mixed-methods approach in future research could also provide richer and more detailed insights. Combining qualitative and quantitative data can offer a more comprehensive understanding of the phenomena (Grošelj et al., 2020). Qualitative methods can explore the contextual and subjective aspects of TL and IWB, while quantitative methods can provide statistical rigor and generalizability. Cross-cultural research is essential to assess the consistency and generalizability of the findings. Including a more diverse sample of companies from various sectors, cultures, and countries can enhance the robustness of the results (Grošelj et al., 2020). Understanding cultural and sectoral differences in TL and IWB can help tailor leadership practices to diverse organizational environments.

Finally, conducting studies at the team level can yield more valid results and better reflect the dynamics of leadership and innovation within organizations (Anser et al., 2021). Team-level analyses can capture the collective aspects of TL and IWB, providing insights into how team interactions and dynamics influence innovative behaviors. In conclusion, addressing these limitations through the proposed future research suggestions can contribute to a more comprehensive and nuanced understanding of how TL influences IWB. This, in turn, will refine theoretical models and inform about practical leadership practices, ultimately enhancing our understanding of the complex relationship between TL and IWB across different organizational landscapes. Future research incorporating these recommendations will provide a richer and more accurate portrayal of the factors that drive IWB and the role of leadership in fostering innovation.

Disclosure statement

No potential conflict of interest was reported by the authors.

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Appendix

Table 7. Measurements

Construct	Item/Variable	Source
1	*2*	*3*
Transformational leadership (*idealized influence*)	My leader instills pride in social interactions (TL1) My leader speaks about my values and beliefs (TL2) My leader emphasizes strong goals (TL3) My leader encourages collaboration over personal interests (TL4) My leader enhances my reputation (TL5)	Afsar, Masood, & Umrani (2019)
Transformational leadership (*inspirational motivation*)	My leader is optimistic about the future (TL6) My leader is enthusiastic about what needs to be achieved (TL7) My leader articulates a compelling vision of the future (TL8) My leader is confident that goals can be achieved through actions (TL9) My leader considers the ethical and moral consequences of decisions (TL10)	Afsar, Masood, & Umrani (2019)
Transformational leadership (*intellectual stimulation*)	My leader encourages me to think critically (TL11) My leader seeks different perspectives in problem-solving (TL12) My leader encourages me to view diverse perspectives (TL13) My leader demonstrates authority and confidence (TL14) My leader is always looking for new ways to accomplish tasks (TL15)	Afsar, Masood, & Umrani (2019)
Transformational leadership (*individual consideration*)	My leader provides me with guidance (TL16) My leader values the individuality of each person (TL17) My leader acknowledges differences (TL18) My leader emphasizes common interests (TL19) My leader helps others improve their capabilities (TL20)	Afsar, Masood, & Umrani (2019)
Knowledge sharing behavior	I actively share knowledge within the department (KSB1) I frequently take time to share knowledge (KSB2) I always share knowledge when participating (KSB3) In complex issues, I engage in extended discussions (KSB4) I discuss multiple topics, not just a single one (KSB5)	Phung et al. (2019)

Table 7 cont.

1	*2*	*3*
Innovative work behavior (*idea generation*)	I develop new ideas to tackle difficult issues (IWB1) I explore new working methods, techniques, or tools (IWB2) I come up with original solutions to problems (IWB3)	Phung et al. (2019)
Innovative work behavior (*idea promotion*)	I rally support for my new ideas (IWB4) I inspire key organizational members with my new ideas (IWB5) I secure approval for my new ideas (IWB6)	Phung et al. (2019)
Innovative work behavior (*idea implementation*)	I convert my new ideas into practical applications (IWB7) I systematically introduce my new ideas into the work environment (IWB8) I assess the effectiveness of my new ideas (IWB9)	Phung et al. (2019)
Job crafting (*increasing structural resources*)	I strive to enhance my capabilities (JC1) I work on developing myself professionally (JC2) I seek to learn new things at work (JC3) I ensure I utilize my capacities to their fullest (JC4) I organize my work to avoid prolonged periods of intense concentration (JC5)	Afsar, Masood, & Umrani (2019)
Job crafting (*increasing social resources*)	I request coaching from my supervisor (JC6) I ask my supervisor if they are satisfied with my work (JC7) I look to my supervisor for inspiration (JC8) I seek feedback on my job performance from others (JC9) I ask colleagues for advice (JC10)	Afsar, Masood, & Umrani (2019)
Job crafting (*increasing challenging job demands*)	I am open to innovative advancements (JC11) I proactively use my available time to start new assignments (JC12) I willingly take on additional tasks without expecting extra pay (JC13) I voluntarily engage in challenging assignments (JC14) I strive to increase the complexity of my work (JC15)	Afsar, Masood, & Umrani (2019)

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