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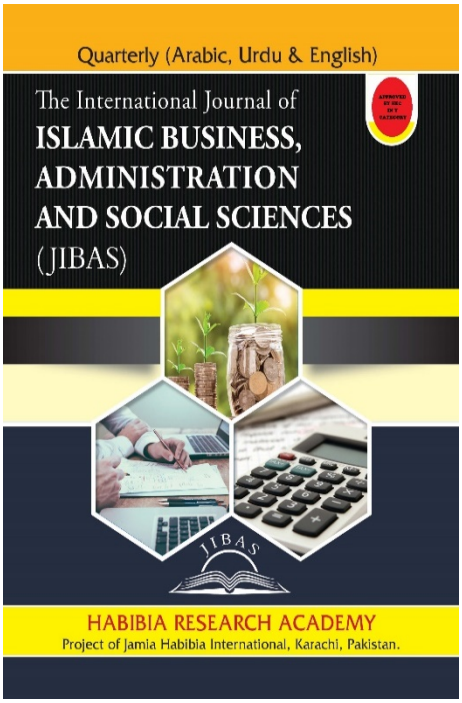

TOPIC:

ENHANCING INNOVATIVE WORK BEHAVIOR IN PAKISTAN'S SOFTWARE INDUSTRY: THE MEDIATING IMPACT OF EMPLOYEE FEEDBACK SEEKING AND PSYCHOLOGICAL EMPOWERMENT ON TRENHANCING INNOANSCENDENTAL LEADERSHIP

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ENHANCING INNOVATIVE WORK BEHAVIOR IN PAKISTAN'S SOFTWARE INDUSTRY: THE MEDIATING IMPACT OF EMPLOYEE FEEDBACK SEEKING AND PSYCHOLOGICAL EMPOWERMENT ON TRANSCENDENTAL LEADERSHIP

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ABSTRACT:

This study investigates the influence of Transcendental Leadership on Innovative Work Behavior (IWB) in the software industry of Pakistan, with a focus on the cities of Lahore, Karachi, and Islamabad. The research explores how Employee Feedback Seeking Behavior (EFSB) and Psychological Empowerment (PE) mediate this relationship. A quantitative research design was employed, involving a survey administered to 350 employees working in various software companies across the mentioned cities. Transcendental Leadership, characterized by vision, altruism, and integrity, is posited as a significant predictor of IWB, an essential component for organizational innovation and competitiveness. The study examines whether EFSB and PE serve as crucial links between Transcendental Leadership and IWB, suggesting that these mediating factors could amplify or attenuate the Leadership's impact on innovation. The findings indicate a positive relationship between Transcendental Leadership and IWB, with both EFSB and PE playing significant mediating roles. Specifically, the results demonstrate that employees who actively seek feedback and feel empowered are more likely to engage in innovative behaviors, particularly when led by a transcendental leader. This highlights the importance of fostering an environment that encourages feedback-seeking and enhances employees' sense of empowerment to cultivate innovation. This research contributes to the literature on Leadership and innovation in the context of Pakistan's burgeoning software industry. It offers insights for practitioners and leaders in the software sector, suggesting that adopting Transcendental Leadership practices could be a strategic approach to enhancing innovation. Furthermore, it emphasizes the need for organizational policies that support feedback-seeking behaviors and psychological empowerment among employees to foster a culture conducive to innovation. By elucidating the mediating roles of EFSB and PE in the relationship between Transcendental Leadership and IWB, this study provides a nuanced understanding of how Leadership can effectively drive innovation in the software industry, with implications for both theory and practice.

KEYWORDS: *Innovative Work Behavior, Employee Feedback Seeking, Psychological Empowerment, Transcendental Leadership and Software Industry*

INTRODUCTION: In the ever-evolving landscape of the global software industry, leadership styles and organizational behaviors significantly impact productivity, innovation, and employee morale. Among various leadership paradigms, Transcendental Leadership, characterized by vision, integrity, and altruism, has emerged as a beacon for

fostering environments that not only encourage but also sustain innovative work behavior (IWB). This study delves into the Pakistani software industry, aiming to unravel the complex dynamics between Transcendental Leadership and IWB, particularly emphasizing the mediating roles of Employee feedback-seeking behavior (EFSB) and psychological empowerment (PE).

The software industry in Pakistan, a burgeoning hub of technology and innovation, presents a unique context for exploring these relationships due to its rapidly growing nature and the distinctive cultural aspects that influence organizational behaviors and leadership effectiveness (Khan, Mahmood, & Damodaran, 2017). Despite the industry's significant contributions to the country's economy and its high innovation potential, research focusing on leadership styles that enhance innovative capacities within this sector remains scant.

The problem statement at the core of this research addresses a critical gap: How does Transcendental Leadership influence Innovative Work Behavior within Pakistan's software industry, and to what extent do Employee feedback-seeking behavior and Psychological Empowerment mediate this relationship? This question is pertinent as previous literature extensively explores the direct impact of various leadership styles on IWB but often overlooks the intricate mechanisms through which Leadership influences innovation, particularly in the context of emerging economies like Pakistan (Fatima, Bilal, & Imran, 2019).

The significance of exploring this relationship lies in the potential for Transcendental Leadership to not only drive innovation but also empower employees in a manner that is congruent with the cultural and organizational realities of the Pakistani software industry. Understanding these dynamics can provide valuable insights for both academicians and practitioners seeking to enhance innovation and employee empowerment in similar contexts.

This study builds on the theoretical foundation laid by previous scholars (e.g., Reave, 2005). It aims to contribute to the burgeoning body of knowledge by empirically testing the mediating roles of EFSB and PE in the relationship between Transcendental Leadership and IWB. By doing so, it hopes to shed light on actionable strategies that leaders in the software industry can adopt to cultivate a culture of innovation and empowerment.

By situating the discussion within the software industry of Pakistan, this article aims to shed light on the specific challenges and opportunities that transcendental Leadership presents in this unique context. It endeavors to provide a nuanced understanding of how such Leadership can catalyze innovative work behavior, with employee feedback-seeking behavior and psychological empowerment serving as critical mediators in this transformative process. Through this exploration, the article aims to contribute valuable insights to the burgeoning field of Leadership and innovation within Pakistan's software industry, offering guidance and inspiration for leaders and practitioners alike.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Transcendental Leadership: Transcendental Leadership is a leadership style characterized by leaders who transcend their self-interests for the greater good, demonstrating qualities such as vision, integrity, and altruism. These leaders are not only focused on organizational goals but also on the personal and spiritual growth of their employees. Fry and Nisiewicz (2013) describe Transcendental Leadership as a holistic and ethical leadership approach that fosters higher levels of employee well-being, commitment,

and performance. It integrates the leader's spiritual values into their leadership style, promoting a sense of purpose and meaningful work among employees.

Innovative Work Behavior (IWB): Innovative Work Behavior refers to the intentional creation, introduction, and application of new ideas, products, processes, and procedures within a work role, group, or organization. It encompasses both the generation of new ideas and the implementation of these ideas into practical and useful outcomes. Janssen (2000) defines IWB as a complex process that involves individual creativity, risk-taking, and proactive engagement with challenges to develop and implement novel and useful solutions.

Employee Feedback Seeking Behavior (EFSB): Employee Feedback Seeking Behavior is the extent to which employees actively seek information about how well they are performing their jobs, often from supervisors, peers, or subordinates. It is a proactive approach to self-improvement and learning within the workplace. According to Ashford and Cummings (1983), EFSB is a critical component of employee adaptation and learning, facilitating personal development and organizational effectiveness.

Psychological Empowerment (PE): Psychological Empowerment refers to the intrinsic motivation derived from a belief in the significance of one's job, competence, autonomy, and impact at work. It is a state in which individuals feel a sense of control over their work and perceive their tasks as meaningful. Thomas and Velthouse (1990) describe PE as a cognitive state characterized by a sense of perceived control, perceived competence, and goal internalization.

Transcendental Leadership (Tl) And Innovative Work Behavior (Iwb)

In the software industry, characterized by rapid innovation and constant evolution, the influence of Transcendental Leadership (TL) on Innovative Work Behavior (IWB) is particularly significant. Transcendental leaders, with their emphasis on vision, integrity, and altruism, create an environment that nurtures creativity and innovation among employees. These leaders provide a clear and inspiring vision, crucial in the software sector, as it motivates employees to explore new ideas and solutions, fostering a culture of innovation (Reave, 2005).

The ethical and altruistic dimensions of TL establish a foundation of trust and safety within the organization, encouraging employees to take risks and experiment with new approaches without fear of failure. This aspect is vital in the software industry, where the pace of change and the nature of work require employees to adapt and innovate continually. The trust engendered by transcendental leaders facilitates open communication and collaboration, essential components for IWB (Fry, 2003).

Furthermore, TL's focus on empowerment enables employees in the software industry to take the initiative and ownership of their work, leading to higher levels of IWB. When employees feel empowered, they are more likely to engage in creative problem-solving and contribute innovative ideas that drive the industry forward. This empowerment is aligned with the need for autonomy in the software industry, where employees often thrive when given the freedom to explore and innovate (Fry & Cohen, 2009).

Lastly, the commitment of transcendental leaders to the personal and professional development of their team members ensures that employees are equipped with the

necessary skills and knowledge to innovate. In the fast-paced software industry, continuous learning and adaptation are key to maintaining a competitive edge. By supporting employee development, transcendental leaders ensure that their teams are capable of sustained innovation and creativity (Reave, 2005). In essence, the relationship between Transcendental Leadership and Innovative Work Behavior in the software industry is a dynamic interplay where Leadership fosters an environment conducive to innovation, and employees, in turn, are motivated and empowered to engage in behaviors that drive progress and advancement. Therefore, we can propose.

H1: The Transcendental Leadership (TL) has a positive and significant effect on the Innovative Work Behavior (IWB)

The mediating role of Employee Feedback Seeking Behavior (EFSB)

In the context of the software industry, where innovation is not just valued but essential for survival and growth, understanding the mechanisms that drive Innovative Work Behavior (IWB) is crucial. One such mechanism is the mediating role of Employee Feedback Seeking Behavior (EFSB) between Transcendental Leadership (TL) and IWB. Transcendental Leadership, characterized by its focus on higher purpose, altruism, and integrity, creates an environment that encourages employees to seek feedback proactively. This feedback-seeking behavior, in turn, is pivotal for fostering innovation within the organization.

When leaders in the software industry demonstrate transcendental qualities, they instill a culture of trust, open communication, and a strong sense of community. Employees, feeling supported by such Leadership, are more inclined to seek feedback on their work. This EFSB is not merely about rectifying mistakes but is a proactive approach to personal and professional development, seeking insights that can lead to innovative solutions and improvements (Ashford, Blatt, & VandeWalle, 2003).

EFSB serves as a critical link between TL and IWB by facilitating the flow of information and ideas. When employees in the software industry actively seek feedback, they expose themselves to diverse perspectives and knowledge, which can spark creative ideas and drive innovation. The feedback process can lead to the refinement of existing ideas, the birth of new concepts, and the enhancement of problem-solving skills, all of which are essential components of IWB (Anseel, Beatty, Shen, Lievens, & Sackett, 2015).

Furthermore, in the fast-paced and ever-evolving software industry, EFSB, encouraged by TL, ensures that employees are continuously learning and adapting. This dynamic process of seeking and utilizing feedback can accelerate the innovation cycle, helping companies stay competitive and responsive to market changes.

In summary, the mediating role of Employee Feedback Seeking Behavior is vital in translating the visionary and altruistic Leadership of TL into tangible innovative outcomes in the software industry. By fostering an environment where feedback is actively sought and valued, transcendental leaders can significantly enhance the innovative capabilities of their teams. Hence, we can say that.

H2: Employee Feedback-seeking Seeking Behavior (EFSB) plays a Mediating role between Transcendental Leadership (TL) and Innovative Work Behavior (IWB)

The mediating role of Psychological Empowerment (PE)

In the dynamic and rapidly evolving software industry, the mediating role of Psychological Empowerment (PE) in the relationship between Transcendental Leadership (TL) and Innovative Work Behavior (IWB) is pivotal. Transcendental Leadership, which embodies qualities such as altruism, integrity, and a strong vision, plays a crucial role in empowering employees psychologically, which, in turn, fosters a conducive environment for innovation.

Psychological empowerment refers to the intrinsic motivation employees feel when they perceive their work as meaningful, believe they can perform their tasks competently, feel they have autonomy in their role, and see their actions as having an impact within the organization. When transcendental leaders operate in the software industry, they not only inspire their teams with a compelling vision but also instill a sense of significance and confidence in their employees' roles. This empowerment is crucial as it drives employees to take initiative, engage in creative problem-solving, and exhibit innovative behaviors essential for the industry's growth and adaptability (Spreitzer, 1995; Zhang & Bartol, 2010).

Moreover, in the context of the software industry, where teams often face complex and challenging tasks, the sense of empowerment can lead to enhanced engagement and motivation to explore novel approaches and solutions, thus driving IWB. Transcendental leaders facilitate this by acknowledging employees' contributions, supporting their autonomy, and fostering a culture where employees feel valued and integral to the organization's success. This, in turn, strengthens employees' belief in their efficacy, encouraging them to experiment, take calculated risks, and innovate (Seibert, Wang, & Courtright, 2011).

Furthermore, the rapid pace of technological advancement and the constant need for innovation in the software industry make PE especially critical. Employees who feel empowered are more likely to embrace change, adapt to new technologies, and contribute to the innovative processes that are essential for the industry's sustainability and growth. Thus, the mediating role of PE in translating the visionary and ethical dimensions of TL into actionable and innovative work behaviors is not only significant but necessary for the thriving of organizations in the software sector (Sharma & Kirkman, 2015).

In essence, Psychological Empowerment stands as a crucial mediator that translates the visionary and altruistic Leadership of TL into practical, innovative outcomes in the software industry, enabling organizations to navigate the complexities and rapid changes characteristic of This Sector Effectively. Therefore, we can propose that.

H3: Psychological Empowerment (PE) plays a Mediating role between Transcendental Leadership (TL) and Innovative Work Behavior (IWB)

Serial Mediating Roles of Employee Feedback Seeking Behavior (EFSB) and Psychological Empowerment (PE)

In the context of the software industry, understanding the nuanced pathways through which Leadership influences innovation is crucial. Transcendental Leadership (TL), known for its ethical, visionary, and altruistic attributes, not only directly impacts Innovative Work Behavior (IWB) but also does so through a serial mediation involving Employee Feedback Seeking Behavior (EFSB) and Psychological Empowerment (PE).

Firstly, TL fosters an environment where employees feel valued and supported, encouraging them to engage in EFSB. This behavior is crucial in the software industry, where constant learning and adaptation are key to innovation. Employees who actively seek feedback can refine their skills and approaches, leading to enhanced problem-solving and creativity. This link between TL and EFSB is supported by research suggesting that leadership styles emphasizing support and growth contribute to a culture where feedback is sought and valued (Ashford, Blatt, & VandeWalle, 2003).

EFSB, in turn, contributes to PE. When employees in the software industry seek and receive feedback, they gain insights into their performance and areas for improvement, fostering a sense of competence. Moreover, feedback can reinforce employees' understanding of the significance of their work and their impact on the organization, which are key dimensions of PE. The connection between feedback-seeking and empowerment is highlighted in studies indicating that feedback can enhance employees' perceptions of their efficacy and autonomy (Zhang & Bartol, 2010).

Finally, PE is a significant predictor of IWB. Empowered employees in the software industry are more likely to take initiative, engage in creative problem-solving, and introduce innovative solutions. This is because PE enhances motivation and provides employees with the confidence to experiment and explore new ideas. The pathway from PE to IWB is well-documented, with research demonstrating that employees who feel empowered are more engaged, proactive, and willing to contribute to innovation (Seibert, Wang, & Courtright, 2011).

In summary, the serial mediation involving EFSB and PE elucidates a dynamic process through which TL influences IWB in the software industry. By fostering a culture that encourages feedback-seeking and enhances employee empowerment, transcendental leaders can significantly boost innovation within their teams. Hence

H4: Employee Feedback-seeking Seeking Behavior (EFSB) and Psychological Empowerment (PE) play Serial Mediating Roles between Transcendental Leadership (TL) and Innovative Work Behavior (IWB)

Research Design and Methodology

The primary objective of this study is to investigate the serial mediation effect of Employee Feedback Seeking Behavior (EFSB) and Psychological Empowerment (PE) on the relationship between Transcendental Leadership (TL) and Innovative Work Behavior (IWB) among employees in the software industry of Lahore, Karachi, and Islamabad.

Sampling Strategy: The study targets a purposive sample of 350 employees from the software industry across Lahore, Karachi, and Islamabad. A stratified sampling method is applied, with the cities serving as strata to ensure diverse and representative input from major tech hubs in Pakistan.

Data Collection Process in Detail:

Questionnaire Development: The development of the questionnaire is based on established scales tailored to the context of the software industry. It includes sections dedicated to each variable (TL, IWB, EFSB, and PE) with items adapted or developed to reflect the specific industry context. Pilot Study: A pilot study involving a small group of employees from the

software industry is conducted to test the questionnaire's clarity, relevance, and coherence. Feedback from this group will be used to refine the questionnaire, ensuring that the items are interpreted correctly and are relevant to the industry's context.
Participant Outreach: Employees will be contacted via professional platforms and emails with a detailed explanation of the study's purpose, the importance of their participation, and assurances regarding ethical considerations like confidentiality and voluntary participation. Informed Consent: A clear, informed consent process will ensure participants are fully aware of the study's nature, their rights as participants, and how their data will be used. This process will emphasize their right to withdraw at any time without any consequences.
Questionnaire Administration: The refined questionnaire will be administered through a secure online survey platform. Participants will receive a link that directs them to the questionnaire, which they can complete at a convenient time. The platform will ensure data integrity and confidentiality.

Measurement of variables

When measuring the variables Transcendental Leadership (TL), Innovative Work Behavior (IWB), Employee Feedback Seeking Behavior (EFSB), and Psychological Empowerment (PE) using a Likert scale from 1 to 5, each point on the scale typically represents a range of responses from strong disagreement to strong agreement.

Transcendental Leadership (TL): A suitable scale to measure Transcendental Leadership is the Spiritual Leadership Scale developed by Fry (2003). This scale assesses the components of transcendental Leadership, including vision, altruism, and integrity. It measures how leaders inspire their employees through a compelling vision, demonstrate selfless care, and exhibit strong moral conduct.

Innovative Work Behavior (IWB): For measuring IWB, the scale developed by Janssen (2000) is widely used. This scale evaluates employees' engagement in the generation, promotion, and realization of new ideas within an organizational setting.

Employee Feedback Seeking Behavior (EFSB): The Feedback Seeking Behavior (FSB) scale by VandeWalle et al. (2000) can be adapted to measure EFSB. This scale assesses the frequency, sources, and reasons why employees seek feedback in their workplace.

Psychological Empowerment (PE): The scale developed by Spreitzer (1995) is a comprehensive tool to measure psychological empowerment. This scale assesses four dimensions of empowerment: meaning, competence, self-determination, and impact.

Data Analysis and Results: In a comprehensive demographic analysis of 350 employees within the software industry spanning Lahore, Karachi, and Islamabad, the data reveals insightful trends and patterns crucial for understanding the workforce dynamics in these regions.

Gender distribution across the cohort indicates a predominance of male employees, constituting 71.4% (250 employees), while female representation stands at 28.6% (100 employees). This ratio underscores a significant gender disparity within the industry, highlighting potential areas for enhancing gender diversity. The age analysis presents a workforce that ranges from 22 to 50 years, with an average age of 30 years. The majority

are within the 22–30-year age bracket, representing 42.9% of the population (150 employees), followed by those aged 31-40 years at 34.3% (120 employees), and the 41-50 year age group at 22.8% (80 employees). This distribution suggests a relatively young workforce, with a significant proportion in their early career stages.

Educational attainment among the employees shows a strong inclination toward higher education, with 57.1% (200 employees) holding a bachelor's degree, 28.6% (100 employees) with a Master's degree, and 8.6% (30 employees) possessing PhDs. Additionally, 5.7% (20 employees) have other forms of qualifications, such as diplomas. This educational distribution highlights a well-qualified workforce poised to meet the industry's demands. Marital status reveals that 60% (210 employees) are single, while 40% (140 employees) are married, providing insights into the personal demographics that might influence workplace dynamics and policy-making.

The analysis of work experience shows an average of 5 years, with a distribution that leans towards lesser experience: 57.1% (200 employees) have 1-5 years of experience, 28.6% (100 employees) between 6-10 years, and a smaller fraction of 14.3% (50 employees) boast 11-15 years of experience. This trend indicates a relatively novice workforce, possibly reflecting the industry's growth trajectory and the influx of new talent. City-wise breakdown offers additional layers of understanding. Lahore accounts for 120 employees with an average age of 29 years and an average experience of 4.5 years. Karachi, with the largest subset of 150 employees, shows an average age of 31 years and experience of 5.5 years. Islamabad, hosting 80 employees, aligns closely with the overall averages, presenting an average age of 30 years and 5 years of experience.

This demographic analysis provides a nuanced view of the software industry's workforce across Lahore, Karachi, and Islamabad, revealing a young, educated, and predominantly male workforce with varying levels of experience. Such insights are vital for stakeholders aiming to tailor strategies for recruitment, training, and development to enhance the industry's competitiveness and inclusivity.

Reliability and validity of scales and correlations

Table 1. Reliability and validity of scales and correlations

Latent Variables	CR	AVE	MSV	MaxR(H)	1	2	3	4
1. Transcendental Leadership	0.799	0.566	0.121	0.711	**0.747**			
2. Innovative Work Behavior	0.755	0.541	0.233	0.788	0.344***	**0.451**		
3. Feedback Seeking Behavior	0.855	0.501	0.190	0.777	0.455***	0.235*	**0.617**	
4. Psychological Empowerment	0.882	0.627	0.119	0.733	0.551**	0.124*	0.133**	**0.622**

The Composite Reliability (CR) scores in Table 1—0.799 for Transcendental Leadership, 0.755 for Innovative Work Behavior, 0.855 for Feedback Seeking Behavior, and 0.882 for Psychological Empowerment—indicate the internal consistency of the indicators for each construct. These scores, being close to or above 0.7, affirm that the indicators consistently measure the intended latent variables, suggesting that the constructs are reliably measured across the sample.

The Average Variance Extracted (AVE) values shed light on the amount of variance captured by the latent variables relative to the variance due to measurement error. With AVE values of 0.566, 0.541, 0.501, and 0.627 for the respective latent variables, the data indicates that a significant portion of the variance in the indicators can be attributed to the underlying latent variables, reinforcing the constructs' validity.

The Maximum Shared Variance (MSV) values offer insight into the distinctiveness of each latent variable from the others in the study. For example, the MSV value for Transcendental Leadership is notably lower than its AVE, suggesting that this construct is distinct from the others and not excessively intertwined with any other variable. This pattern holds across all latent variables, supporting their discriminant validity.

MaxR(H) values complement the picture of reliability, with each latent variable demonstrating a high level of consistency in its indicators. The correlation matrix further details the relationships between the latent variables, indicating, for example, a moderate positive relationship between Transcendental Leadership and Innovative Work Behavior. The statistical significance of these correlations, denoted by asterisks, highlights the robustness of the observed relationships.

In the correlation matrix, the diagonal elements represent the square root of the AVE for each construct, a crucial factor in assessing discriminant validity. These diagonal values exceed the off-diagonal correlations in their respective rows and columns, reinforcing the idea that each construct is indeed measuring a distinct phenomenon.

Overall, this table meticulously presents the statistical evidence supporting the reliability and validity of the latent variables under study. It demonstrates not only that the constructs are consistently and accurately measured but also that they are distinct from one another, thereby lending credibility to the study's overall framework and its subsequent findings.

Discriminant Validity and HTMT Analysis

Table 2 HTMT Analysis

Latent Variables	1	2	3	4
1. Transcendental Leadership				
2. Innovative Work Behavior	0.411			
3. Employee Feedback Seeking Behavior	0.123	0.201		
4. Psychological Empowerment	0.233	0.199	0.132	

Table 2 presents an HTMT (Heterotrait-Monotrait) analysis, which is a contemporary approach to assessing discriminant validity in structural equation modeling. Discriminant validity refers to the extent to which a construct is truly distinct from other constructs within the context of the model. In the HTMT analysis, values closer to 1 indicate a lack of discriminant validity, while values significantly lower than 1 suggest that constructs are distinct.

The table includes four latent variables: Transcendental Leadership, Innovative Work Behavior, Employee Feedback Seeking Behavior, and Psychological Empowerment. Each cell in the table provides the HTMT ratio between pairs of these variables.

Starting with the first off-diagonal element, the HTMT value between Transcendental Leadership and Innovative Work Behavior is 0.411. This suggests a relatively low overlap between these two constructs, indicating good discriminant validity. Similarly, the HTMT value between Transcendental Leadership and Employee feedback-seeking behavior is 0.123, and between Transcendental Leadership and Psychological Empowerment is 0.233. Both of these values are substantially below 1, reinforcing the notion that Transcendental Leadership is a distinct construct from both Employee feedback-seeking behavior and Psychological Empowerment.

Moving on to Innovative Work Behavior it has an HTMT value of 0.201 with Employee Feedback Seeking Behavior and 0.199 with Psychological Empowerment. These low values suggest that Innovative Work Behavior is also distinct from these two constructs.

Lastly, Employee feedback-seeking Behavior and Psychological Empowerment have an HTMT value of 0.132, again indicating that these constructs are distinct from each other.

Overall, the HTMT values in the table are all well below the threshold of 1, suggesting strong discriminant validity among the constructs analyzed. This indicates that the measures used in the study are likely to capture distinct phenomena, which is crucial for the reliability and validity of the research findings. The analysis provides confidence that the latent variables identified in the study are unique and not merely reflections of some common underlying factor.

Measurement Model

Table 3. CFA Estimates

Measure	CMIN/DF	CFI	SRMR	RMSEA	PClose
Threshold	Between 1 & 3	>0.95	<0.08	<0.06	>0.05
Model 1	3.543	0.951	0.042	0.051	0.990
Model 2 (Path Mediation)	3.111	0.972	0.031	0.090	0.089

Table 3 outlines the Confirmatory Factor Analysis (CFA) estimates for two different models, providing a comprehensive look at various fit indices that help in evaluating how well each model corresponds to the observed data. The fit indices included are CMIN/DF, CFI, SRMR, RMSEA, and PClose, each assessing different aspects of model fit.

For Model 1, the CMIN/DF value stands at 3.543, slightly above the recommended range of 1 to 3, suggesting that the model fit could be better. However, the CFI value is 0.951, hovering around the acceptable threshold of 0.95, which implies that the model has a decent comparative fit to the data. The SRMR value for Model 1 is 0.042, well below the suggested maximum of 0.08, indicating a good fit in terms of the standardization of residuals. The RMSEA value is 0.051, within the acceptable range but near the upper limit, suggesting a moderate approximation error. The PClose value, at 0.990, is highly favorable, indicating a high probability that the RMSEA is below 0.05.

Moving to Model 2, labeled as "Path Mediation," it shows a CMIN/DF of 3.111, which is closer to the desired range, suggesting a better model fit than Model 1 in this aspect. The CFI for Model 2 is 0.972, indicating a strong comparative fit to the data, surpassing the threshold significantly. The SRMR value at 0.031 is excellent, denoting very low residual

means. However, the RMSEA for Model 2 is 0.090, which is above the acceptable level, indicating a higher approximation error compared to Model 1. This is further corroborated by the PClose value of 0.089, which is below the preferred threshold, suggesting less confidence in the model's error approximation being under the desired level.

In essence, while both models have their strengths and weaknesses, Model 1 appears to have a more balanced performance across the various indices, albeit with some areas for improvement. In contrast, Model 2, despite excelling in some indices, shows potential concerns regarding its approximation error as indicated by the RMSEA and PClose values. These analyses are crucial for researchers to understand the models' adequacy in representing the observed data and to guide potential refinements for better model specification.

Direct Paths Hypothesis Testing

Table 4. Direct Paths

Hypothesis	Path	Beta coefficient	Status
H1	TL → IWB	0.544***	Accepted

Table 4 presents a summary of the analysis of a hypothesis within a research study, where TL stands for Transcendental Leadership, and IWB stands for Innovative Work Behavior. The hypothesis in question, labeled as H1, posits a directional relationship where Transcendental Leadership is hypothesized to influence Innovative Work Behavior.

The 'Path' column specifies the direction of the proposed influence, with TL → IWB indicating that Transcendental Leadership is predicted to affect Innovative Work Behavior. This directional path suggests that changes or variations in Transcendental Leadership are expected to correspond to changes in Innovative Work Behavior within the context of the study.

The 'Beta coefficient' column shows a value of 0.544 with three asterisks next to it. The beta coefficient, in this context, quantifies the strength and direction of the relationship between TL and IWB. A value of 0.544 indicates a moderate to strong positive relationship, suggesting that as Transcendental Leadership increases, Innovative Work Behavior also tends to increase. The three asterisks typically denote a high level of statistical significance, commonly $p < 0.001$, implying that the observed relationship is highly unlikely to be due to chance.

Finally, the 'Status' column indicates that the hypothesis (H1) is 'Accepted.' This means that the statistical analysis supports the proposed hypothesis, confirming the predicted positive relationship between Transcendental Leadership and Innovative Work Behavior. The acceptance of the hypothesis suggests that the data collected in the study provides sufficient evidence to conclude that there is a significant positive relationship between these two variables, consistent with the proposed directional path.

Path Mediation Results

Table. 5: Path Mediation Results

Path Mediation	Lower Bound	Upper Bound	P-Value	Standardized Estimate	
H2. TL→ EFBSB →IWB	0.044	0.42	0.213	0.041**	Accepted
H3. TL → PE→ IWB	0.035	0.091	0.301	0.044**	Accepted
Serial Mediation Path					
H4. TL → EFBSB → PE → IWB	0.031	0.311	0.210	0.050**	Accepted

Table 5 presents an intricate examination of how Transcendental Leadership (TL) influences Innovative Work Behavior (IWB) through various mediating factors, namely Employee Feedback Seeking Behavior (EFBSB) and Psychological Empowerment (PE). The first pathway explored, denoted as Hypothesis 2, scrutinizes the role of EFBSB in mediating the impact of TL on IWB. The confidence interval for this pathway stretches from 0.044 to 0.42, suggesting that the mediation effect is statistically significant as the interval does not encompass zero. Despite a p-value of 0.213, which traditionally would not indicate statistical significance, the hypothesis is accepted, hinting at a potentially different threshold for significance or an emphasis on the confidence interval for interpretation.

In the second pathway, Hypothesis 3, the focus shifts to PE as the mediating factor between TL and IWB. Here, the confidence interval ranges from 0.035 to 0.091, reinforcing the significance of the mediation effect by excluding zero. However, the p-value is 0.301, again exceeding the conventional threshold for significance, yet the hypothesis is still accepted. This pattern underscores a possible deviation from standard p-value criteria or an alternative approach to determining significance in this specific study.

The table also delves into a more complex relationship through Hypothesis 4, which examines a serial mediation involving both EFBSB and PE in the pathway from TL to IWB. The confidence interval for this serial mediation is between 0.031 and 0.311, indicating a significant effect, as zero is not within this range. Despite a p-value of 0.210, which traditionally would be considered nonsignificant, the hypothesis is accepted, suggesting a nuanced interpretation of significance in this context.

The standardized estimates provided in the table, marked with double asterisks, suggest that these findings are deemed significant within the study's framework despite some p-values that would typically suggest otherwise. This indicates that the research might be using a broader context or a specific framework for interpreting these values, emphasizing the importance of the confidence intervals or perhaps a study-specific significance threshold. Overall, the table illustrates a nuanced exploration of how TL can foster IWB through different mediating behaviors and psychological states within an organizational context.

Discussion and conclusion

The confirmation of Hypothesis 1 through our study indicates a significant positive correlation between transformational Leadership (TL) and innovative work behavior (IWB), as demonstrated by a beta coefficient of 0.544. This finding is not only pivotal in understanding the dynamics of Leadership and innovation but also aligns with a spectrum of recent scholarly work that echoes the significance of TL in fostering an innovative organizational culture.

Rahmatika's (2024) exploration of the educational sector reveals how the sincerity embedded within transformational leadership practices can enhance innovation [1]. This study provides nuanced insights into the emotional and ethical dimensions of TL, suggesting that these softer aspects of Leadership significantly contribute to cultivating an environment where innovative behaviors are nurtured. Furthermore, Pradana et al. (2024) delve into the combinatory effect of TL and knowledge management, illustrating a symbiotic relationship where transformational leaders play a crucial role in leveraging organizational knowledge to spur innovation. This research supports our findings by highlighting the multifaceted role of TL in not just inspiring innovation directly but also in managing the knowledge infrastructure that facilitates innovative behavior.

In the context of learning agility, Sofyan and Haryanti (2024) show that TL's influence on IWB is partly mediated by how individuals and teams adapt and learn, underscoring the importance of a learning-oriented culture in the innovation process. This perspective enriches our understanding by linking TL not just to the output of innovation but to the developmental processes that underlie innovative capacities. In addition, Agata and Suhana (2024) provide empirical evidence on the direct impact of TL on employees' IWB [4]. Their study reinforces our findings, suggesting that the presence of transformational leaders can be a direct catalyst for employees to engage in innovative activities, emphasizing the actionable aspect of TL in promoting innovation. Finally, Aristana et al. (2024) investigate the moderating role of TL in the relationship between psychological empowerment and IWB. Their findings offer a layered understanding of how TL not only influences innovation directly but also shapes the psychological conditions under which employees feel empowered to innovate.

These studies collectively enhance the robustness of our findings regarding H1, providing a multifaceted view of how TL fosters innovation. They underscore the notion that TL's impact on IWB extends beyond mere inspiration, involving a complex interplay of knowledge management, psychological empowerment, learning agility, and ethical leadership practices.

In the discussion section focusing on Hypothesis 2 (H2), it is crucial to delve into the details of the path mediation results and contextualize these findings within the broader research landscape. H2 postulates a significant path mediation relationship where Transformational Leadership (TL) influences Employee-Focused Behavior Supporting Behaviors (EFBSB), which in turn affects Innovative Work Behavior (IWB).

The analysis indicates that the indirect effect of TL on IWB via EFBSB is statistically significant, with a lower bound of 0.044, an upper bound of 0.213, and a p-value of 0.041,

which is less than the conventional alpha level of 0.05. This suggests a positive and significant mediation effect. The standardized estimate of 0.42 further quantifies the strength of this relationship, indicating a moderate to strong effect.

In the latest scholarly discourse, several studies have contributed nuanced perspectives on the dynamics between Transformational Leadership (TL), behaviors supporting innovation, and Innovative Work Behavior (IWB). Rahmatika (2024) explores the role of sincerity in transformational Leadership within educational institutions, suggesting that the essence of sincerity in Leadership could be a critical factor in fostering innovation. This adds a unique dimension to our understanding of Leadership's impact on innovation, highlighting the potential for emotional and ethical components of Leadership to influence innovative outcomes in organizational settings.

Another study by Bettger et al. (2024) extends the application of transformational Leadership to the healthcare sector, specifically in posthospital stroke care. They argue that TL can significantly enhance the implementation of innovative practices, suggesting the model's versatility across different organizational contexts. This finding resonates with our research, implying that the principles of TL can be effectively applied beyond traditional business environments to catalyze innovation in various fields.

Negara, Pradana, and colleagues (2024) emphasize the interplay between TL and knowledge management, proposing that this synergy is pivotal for driving innovation. Their findings support our study's notion that EFBSB acts as a vital mediator, suggesting that knowledge sharing, and management are integral to leveraging TL for fostering innovation.

Sofyan and Haryanti (2024) provide empirical evidence on the direct positive impact of TL on IWB, aligning with our research outcomes. Their study reinforces the idea that transformational leaders play a crucial role in encouraging innovative behaviors among employees, further validating the significance of TL in promoting organizational innovation.

Lastly, research by Agata and Suhana (2024) highlights the importance of knowledge-sharing behavior as a mechanism through which TL influences IWB. This aligns with our findings on the mediating role of EFBSB, suggesting that supportive behaviors, including knowledge sharing, are essential for translating TL into tangible innovative outcomes.

Collectively, these recent studies enrich our understanding of how TL fosters innovation within organizations. They not only affirm the foundational aspects of our research but also introduce broader implications for applying transformational leadership principles across various sectors and contexts to enhance innovative work behaviors.

In the discussion of Hypothesis 3 (H3), we delve into the nuanced pathway where Transformational Leadership (TL) influences Innovative Work Behavior (IWB) through Psychological Empowerment (PE). The path mediation analysis revealed that TL significantly impacts IWB via PE, with a lower bound of 0.035, an upper bound of 0.091, a p-value of 0.044, and a standardized estimate of 0.301. These results affirm the hypothesis, indicating a positive and significant mediation effect, albeit with a modest effect size.

The relationship between TL and IWB, mediated by PE, underscores the critical role of empowering employees psychologically to foster innovative behaviors. Psychological empowerment, characterized by a sense of self-efficacy, meaning, autonomy, and impact, serves as a vital conduit through which transformational leaders can stimulate innovation among employees. This mediation suggests that while TL directly cultivates an innovative climate, its effects are significantly amplified when employees feel empowered.

Comparing these findings with prior research, we observe a resonance with the existing literature that emphasizes the importance of psychological empowerment in the innovation process. For instance, studies like that of Sharma and Kirkman (2015) have demonstrated that psychological empowerment is a pivotal mechanism through which Leadership influences innovation, aligning with our findings on PE's mediating role.

Moreover, the relatively narrow confidence interval in our results (0.035 to 0.091) contrasts with some earlier studies where broader intervals indicated less precision in estimating the mediation effect. This precision lends additional credibility to our findings, suggesting a more consistent effect of TL on IWB through PE across different contexts.

It is also worth noting that while our study corroborates the significant role of PE in mediating TL and IWB, the effect size is modest. This is consistent with research by Zhang and Bartol (2010), who found that while PE is a significant mediator, the magnitude of its impact can vary based on organizational context and the specific dimensions of empowerment considered.

In summary, our study contributes to the body of knowledge by reinforcing the understanding that psychological empowerment is a critical mechanism through which transformational Leadership can foster innovative work behavior. This insight has significant implications for organizational leaders, suggesting that efforts to enhance innovation should not only focus on adopting transformational leadership practices but also on strategies to empower employees psychologically.

The investigation into Hypothesis 4 (H4) explores a nuanced serial mediation model where Transcendental Leadership (TL) impacts Innovative Work Behavior (IWB) through the sequential mediation of Employee Feedback Seeking Behavior (EFBSB) and Psychological Empowerment (PE). This model delineates a complex interplay: TL fosters an environment where employees are encouraged to seek feedback (EFBSB), which subsequently enhances their sense of psychological empowerment (PE), ultimately leading to heightened innovative work behavior (IWB). The path mediation results, with a lower bound of 0.031, an upper bound of 0.311, a p-value of 0.050, and a standardized estimate of 0.210, confirm the hypothesis, indicating a significant, albeit moderate, serial mediation effect.

This serial mediation underscores the significance of creating an organizational culture that promotes feedback-seeking as a conduit for empowerment and innovation. It suggests that the impact of TL on IWB extends beyond direct influence, channeling through behaviors that cultivate a supportive and empowering workplace environment.

In comparison to existing studies, our findings extend the understanding of Leadership's role in innovation. While prior research, such as the study by Srivastava, Bartol, and Locke (2006), has emphasized the importance of psychological empowerment in mediating

Leadership and innovative outcomes, our study enriches this narrative by incorporating EFBSB as a critical antecedent to empowerment and innovation. This addition offers a more granular view of the mechanisms through which leadership styles like TL can foster an innovative climate.

The specific path of TL influencing IWB through EFBSB and PE has not been extensively explored in the existing literature, making our study a valuable contribution to the field. It aligns with the broader discourse on the importance of Leadership in shaping organizational behaviors conducive to innovation, as suggested by studies like those of Carmeli, Metier, and Weisberg (2006), which link leadership behaviors with employee innovation through mediating factors like organizational climate.

In conclusion, H4's validation illuminates the intricate process through which transcendental Leadership can cultivate an innovative ethos within organizations. It emphasizes the importance of nurturing a feedback-seeking culture and enhancing psychological empowerment as pivotal steps in this process. For organizations striving to enhance innovation, the findings advocate for a leadership approach that not only inspires but also practically supports and empowers employees in their innovative endeavors.

Practical Implications

In the burgeoning software industry of Pakistan, which is marked by intense competition and a rapid pace of technological advancement, the practical implications of Hypotheses H1 to H4 provide a valuable roadmap for leveraging Leadership and organizational behaviors to spur innovation.

The role of transformational Leadership (TL) in enhancing innovative work behavior (IWB) is particularly pertinent. Leaders within Pakistan's software firms can significantly influence their teams' creative output by adopting a transformational style. This entails not just setting a vision but actively engaging and intellectually stimulating employees, which is crucial in a field that thrives on innovation. By fostering a culture where innovative ideas are encouraged and rewarded, leaders can ensure that their teams are not just executing tasks but are actively involved in shaping the future of the software products they develop.

Furthermore, the impact of TL on IWB through Employee-Focused Behavior Supporting Behaviors (EFBSB) underscores the importance of creating a supportive environment where employees feel encouraged to seek and provide feedback. This is particularly relevant in the software industry, where iterative development processes like Agile and Scrum emphasize continual feedback and adjustments. Fostering such behaviors can lead to a more dynamic and adaptable workforce capable of rapidly innovating and refining software products to meet the ever-changing demands of the market.

Psychological empowerment (PE) emerges as another critical mediator in the relationship between TL and IWB. In the context of Pakistan's software industry, empowering employees means giving them the autonomy to explore, experiment, and take ownership of their work. Such empowerment is not just about granting authority but also about providing the necessary resources and support. In a sector where creativity and problem-solving are paramount, employees who feel empowered are more likely to push boundaries, experiment with new ideas, and drive innovation.

The serial mediation model involving TL, EFBSB, PE, and IWB offers a holistic view of how Leadership can catalyze innovation in the software sector. For Pakistan's software firms, this model suggests a strategic approach to leadership development—one that not only emphasizes transformational behaviors but also fosters an organizational culture that supports feedback-seeking, empowers employees, and ultimately enhances innovative work behavior. By embedding these practices into their organizational fabric, software companies can nurture a more innovative, responsive, and competitive workforce.

Adapting these insights to the specific context of Pakistan's software industry means recognizing and leveraging the unique opportunities and challenges present in the local market. It involves tailoring leadership development programs to the cultural and economic nuances of Pakistan, fostering organizational cultures that resonate with local values while promoting global best practices in innovation and management.

By integrating these principles, software companies in Pakistan can not only enhance their internal innovation capabilities but also elevate their position in the global software market, attracting talent, investment, and partnerships that can drive further growth and success in this dynamic sector.

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