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Unraveling the Link between Transformational Leadership and Work Engagement: The Mediating Role of Employee Empowerment and the Moderating Effects of Work Experience and Gender

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Abstract

This research examines how transformational leadership (TL) influences work engagement (WE), particularly through the lens of employee empowerment. In the wake of the recent global pandemic, organizations have sought adaptive strategies to recover lost business, with leadership emerging as a pivotal factor in motivating employees. Focusing on the Indian IT sector, a conceptual model was proposed and empirically tested using data from 256 employees in southern India. Psychometric evaluation was conducted via structural equation modeling (Lisrel), followed by analysis using Hayes's PROCESS macro. Findings reveal that TL positively impacts both employee empowerment and WE, with empowerment serving as a mediator in the TL–WE relationship. Moreover, the study identifies moderating effects, showing that work experience influences the strength of the TL–WE link, while gender affects the relationship between TL and empowerment. The results offer important insights for advancing leadership theory and for guiding practical strategies to enhance employee engagement.

Keywords: India, Employee empowerment, Transformational leadership, Work experience, Work engagement

Introduction

Since Bass [1] introduced the concept of transformational leadership (TL), it has become a central focus in studies of organizational behavior and human resource management [2-7]. Evidence indicates that organizational success is largely shaped by leaders' ability to motivate and inspire employees to perform at their highest potential [8-10]. Transformational leaders are recognized for their capacity to navigate crises, address challenges effectively, and drive change by encouraging innovation, fostering trust, and elevating employee performance [1, 3, 11, 12].

The recent COVID-19 pandemic created unprecedented disruptions for organizations worldwide [13-15], necessitating rapid shifts such as remote work, online instruction, and virtual collaboration [16, 17]. These abrupt changes placed significant stress on IT professionals, who became critical in sustaining organizational operations. For instance, higher education institutions relied heavily on IT staff to transition to online teaching, creating immense workload pressures [18, 19]. In developing nations such as India, employees often face additional challenges in managing unexpected demands and high-pressure situations [20].

Against this backdrop, the current study investigates how TL influences work engagement (WE) among employees in the IT sector in India. Transformational leaders are especially pivotal during crises, enhancing employee performance, productivity, and motivation [21, 22]. For example, IT employees have supported faculty members in adapting quickly to online teaching

needs [6, 23]. Transformational leaders are also known to stimulate employees to exceed expectations and achieve higher levels of psychological engagement [24]. Prior research has documented numerous positive outcomes associated with TL, including higher job satisfaction, commitment, performance, and organizational citizenship behavior [4, 25-27].

Despite extensive research on TL in Western contexts, studies in developing countries, particularly within the IT sector, remain limited [28-30]. This study addresses this gap by examining how TL can foster employee engagement amid the post-pandemic "new normal." Specifically, the research introduces employee empowerment as a mediating mechanism between TL and WE. In addition, given that work experience can influence how employees respond to TL, the study investigates the moderating effects of work experience and gender. The research seeks to answer the following questions:

• RQ1: How does employee empowerment mediate the relationship between TL and WE?

• RQ2: How does work experience moderate the relationship between TL and WE?

• RQ3: How does gender moderate the relationship between TL and employee empowerment?

The study makes several key contributions to the literature:

1. It positions TL as a critical driver of work engagement in the post-pandemic context.

2. It highlights the importance of employee empowerment as a mechanism through which TL influences WE.

3. It demonstrates the moderating role of work experience in shaping the impact of TL on WE.

4. It identifies gender differences in the TL–empowerment relationship, offering novel insights into leadership effectiveness.

5. By focusing on the IT sector in India, this research enriches the understanding of leadership and engagement in developing countries under post-pandemic conditions.

The paper is structured as follows: Section 2 reviews relevant theory and develops hypotheses. Section 3 outlines the research methodology. Section 4 presents the analysis and results. Section 5 discusses the findings, implications, limitations, and directions for future research, followed by the conclusion.

Theoretical Background and Hypotheses Development

This study is grounded in two key theoretical frameworks: the Full Range Leadership Theory (FRLT) [31] and the Job Demands–Resources (JD-R) model [32, 33]. Over the past thirty years, FRLT has been a dominant paradigm in leadership research [34, 35], conceptualizing leaders as central actors who can significantly shape organizational outcomes [36, 37]. According to FRLT, the behaviors and approaches of supervisors are crucial for motivating employees to achieve superior performance. Leadership within this framework is typically categorized into three styles: transformational, transactional, and passive [38].

Empirical studies indicate that transformational and, to a lesser degree, transactional leadership styles enhance desirable employee outcomes, such as positive attitudes and improved performance, whereas passive leadership tends to have negative effects [37, 39]. Comparative analyses of these leadership styles consistently show that transformational leadership is particularly effective in achieving organizational objectives. Transformational leaders inspire employees to reach their full potential, guiding them toward organizational goals with higher efficiency and commitment [1, 40]. Among various leadership theories—including trait-based, behavioral, situational, and servant leadership [41]—transformational leadership remains one of the most widely examined contemporary approaches. Organizations increasingly rely on transformational leaders for their ability to encourage employees to exceed standard expectations [42]. Research consistently documents that TL is positively associated with job performance [43, 44] and employee commitment [45], while simultaneously reducing stress, burnout, and turnover intentions [46, 47].

The JD-R model provides a complementary perspective on the workplace environment [33, 48]. It posits that employee stress and burnout increase when job demands are high and resources are insufficient, whereas sufficient job resources can buffer these negative effects. The model distinguishes between two broad categories of job characteristics: job demands and job resources. Job demands encompass physical, psychological, social, and organizational aspects of work that require sustained effort, often leading to strain and potential burnout [33, 49]. Examples include heavy workloads or emotionally challenging client interactions. Conversely, job resources—such as autonomy, social support, feedback, and recognition—facilitate goal achievement, reduce the impact of demands, and foster personal and professional growth [32, 49]. These resources satisfy core psychological needs, including autonomy, relatedness, and competence, and can stimulate both intrinsic and extrinsic motivation, which in turn promotes work engagement, organizational commitment, job satisfaction, and overall performance [50].

Prior research has consistently demonstrated that high job demands are positively associated with burnout, whereas job resources are linked to engagement [51-53]. Moreover, evidence suggests that job resources can mitigate the negative consequences of high demands and are particularly influential under conditions of elevated job stress [32, 50, 54]. In practice, organizations provide employees with resources to support task completion, while simultaneously imposing demands necessary to achieve organizational goals [32]. Striking a balance between demands and resources is essential for fostering a supportive and productive work environment [55].

By integrating the FRLT and JD-R frameworks, this study explains how transformational leadership can enhance work engagement. TL, through its influence on employee empowerment, interacts with job resources to motivate and energize employees, demonstrating the theoretical and practical mechanisms through which leadership style drives engagement and performance outcomes.

Hypotheses development

Transformational leadership and work engagement

Transformational leaders inspire employees and strengthen their belief in their own capabilities, enabling them to achieve both personal and organizational objectives [56]. Through inspirational motivation, such leaders communicate a clear organizational vision, encouraging employees to contribute fully and align their efforts with collective goals [8]. By demonstrating individualized consideration, transformational leaders attend to employees' unique needs, guiding them to accomplish tasks effectively [57, 58]. Their influence positions them as role models, reinforcing employees' perception that active engagement is essential for optimal performance [59, 60]. Furthermore, through intellectual stimulation, leaders promote creativity and innovative thinking, which energizes employees to approach work with dedication and vigor [57, 61, 62].

Work engagement (WE) is defined as a positive, fulfilling, work-related state of mind characterized by vigor, dedication, and absorption [62]. Vigor reflects high levels of energy and resilience, dedication refers to commitment and enthusiasm, and absorption indicates deep concentration in work tasks [63]. Empirical evidence consistently shows a positive link between transformational leadership and WE. For instance, studies among Australian employees [64] and Chinese police officers [65] demonstrate that TL enhances employee engagement. Based on these findings, we propose:

H1: Transformational leadership is positively associated with work engagement.

Transformational leadership and employee empowerment

In management literature, empowerment generally refers to granting authority and autonomy to employees [66], rooted in concepts of participative management, job enrichment, and psychological empowerment [67]. Initially focused on self-efficacy [68], empowerment has evolved into a multidimensional concept encompassing psychological empowerment, intrinsic motivation, and control over resources to perform tasks effectively [24].

Research indicates that transformational leadership fosters empowerment and creativity among employees. For example, studies on Malaysian nurses found that TL increased job satisfaction via empowerment [69], while research in multinational technology firms revealed that empowerment strengthens the relationship between TL and innovation [70]. Intellectual stimulation enhances employees' self-confidence and commitment, whereas inspirational motivation encourages them to take responsibility and participate in decision-making. Accordingly:

H2: Transformational leadership is positively associated with employee empowerment.

Employee empowerment and work engagement

Effective employee empowerment is critical for achieving superior organizational performance, which often translates into measurable outcomes such as productivity and financial success [71]. Studies on Chinese hospital staff [72] and broader organizational research [73, 74] confirm that empowerment enhances WE, productivity, and commitment. Furthermore, research among bank employees in Jordan emphasizes that managerial support for empowerment is essential for goal attainment [75]. Drawing on this evidence:

H3: Employee empowerment is positively associated with work engagement.

Employee empowerment as a mediator

While transformational leaders directly motivate employees to engage in their tasks, the use of employee empowerment can further enhance this engagement [73, 76]. By promoting creativity, innovation, and autonomy, TL enables employees to apply their ideas and take ownership of outcomes [77, 78]. The empowerment model emphasizes that employees derive meaning from their work, which plays a critical role in engagement, performance, and productivity [67, 79]. Transformational leaders are also shown to influence employees' beliefs, values, and needs, boosting commitment, organizational citizenship behavior, and respect for employees' opinions [58, 80, 81].

Thus, in addition to the direct effect of TL on WE, empowerment can serve as a mechanism through which engagement is enhanced. Although this mediating effect has been underexplored in prior research, it is valuable to investigate how transformational leadership promotes WE via empowerment. Hence, we propose:

H4: Employee empowerment mediates the relationship between transformational leadership and work engagement.

Work experience as a moderator

Previous research has highlighted the importance of individual employee characteristics, such as experience and skill, in shaping job performance [82, 83]. Although transformational leaders generally encourage employees to actively engage in their work, employees with greater work experience may be more receptive to leadership influence and demonstrate higher levels of work engagement. For instance, field studies by Yücel and Richard [84] revealed that more experienced employees exhibited stronger commitment within the leader–employee relationship compared to less experienced employees. When transformational leaders motivate employees to pursue goals beyond their self-interest [85], the degree to which employees understand and align with the leader's vision can vary according to their work experience. Therefore, employee characteristics, particularly experience, should be considered when evaluating the impact of TL on work engagement. This study examines the moderating role of work experience and proposes the following hypothesis:

H1a: Work experience moderates the relationship between transformational leadership and work engagement, such that TL has a stronger effect on WE for employees with higher work experience compared to those with lower experience.

Gender as a moderator

Research on gender differences indicates that men and women may respond differently to workplace dynamics [86-88]. In the Indian context, traditional family roles historically positioned men as breadwinners, while women were largely confined to household responsibilities. However, over the past five decades, increased participation of women in the workforce has gradually shifted these roles [89]. Despite urbanization and industrialization facilitating female employment, cultural expectations often still regard domestic responsibilities as primarily female [90].

In organizational settings, gender differences may influence how transformational leadership affects employee empowerment. Leadership roles are still predominantly occupied by men [91], yet women frequently report higher work engagement and job satisfaction [92]. Empirical evidence further suggests that gender impacts psychological empowerment, with male employees being more strongly influenced by TL than female employees [93]. Based on these insights, the following moderation hypothesis is proposed:

H2a: Gender moderates the relationship between transformational leadership and employee empowerment, such that empowerment is higher for male employees compared to female employees.

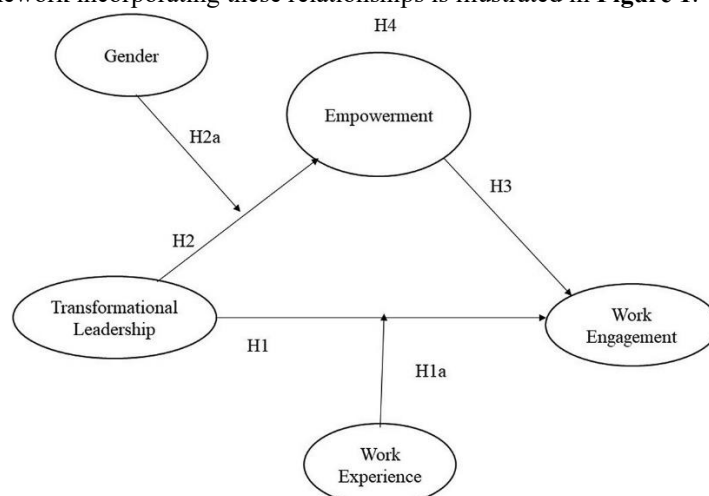The overall conceptual framework incorporating these relationships is illustrated in **Figure 1**.

Figure 1. Conceptual model

Methodology

Variables in the study

Transformational leadership

Transformational Leadership (TL) refers to a dynamic in which leaders and followers mutually elevate one another's motivation and ethical standards [31]. Bass and Avolio [34] identified four core dimensions of TL: individualized consideration, intellectual stimulation, inspirational motivation, and idealized influence.

Individualized consideration emphasizes leaders' attentiveness to the needs, concerns, and aspirations of each employee, ensuring that staff feel valued rather than overlooked. By acknowledging and addressing individual requirements, leaders enhance employees' intrinsic motivation.

Intellectual stimulation captures how leaders encourage staff to think independently and creatively, equipping them to respond to unforeseen challenges and learn from situational opportunities.

Inspirational motivation pertains to leaders clearly communicating organizational vision and assigning challenging tasks, while raising performance expectations and cultivating optimism for achieving objectives. This dimension strengthens employees' confidence to successfully complete their duties.

Idealized influence highlights leaders' ethical conduct and role-model behavior, demonstrating moral standards that followers can emulate.

Podsakoff *et al.* [5] describe TL through six behaviors, including articulating a vision, promoting group goal acceptance, setting high-performance expectations, providing personalized support, and encouraging intellectual engagement. Carless *et al.* [94], building on McKenzie *et al.* [95], developed a concise instrument capturing these elements, which was employed in this study using the Global Transformational Leadership scale.

Work engagement

Work engagement is conceptualized as a positive and fulfilling psychological state characterized by vigor, dedication, and absorption in work [62]. HRD research differentiates three forms: employee engagement, work engagement, and organizational engagement. Employee engagement involves the alignment of an individual's preferred self with work behaviors, fostering connections with colleagues, presence, and effective role performance [96]. Organizational engagement reflects an individual's psychological commitment to a particular role within the organization [97].

Empirical studies have demonstrated that engaged employees experience higher in-role performance, creativity, extra-role behaviors, financial outcomes, and client satisfaction [89, 93, 98-107]. Engaged employees display strong commitment, high energy, enthusiastic involvement in work, and contribute to enhanced productivity and overall performance [108-110].

Empowerment

Empowerment refers to employees' autonomy in decision-making and their accountability for outcomes [111]. Unlike traditional hierarchical delegation, contemporary management practices allow employees discretion in making decisions [112, 113], leading to higher-quality products and services [114, 115] and fostering trust [116]. Research shows that empowered employees engage proactively in work and propose innovative solutions to improve quality [117]. Empowerment also involves contributing to goal-setting, defining objectives, and developing strategies for enhanced performance [118]. Organizations support empowerment by providing continuous training and professional development opportunities [119, 120].

Gender and work experience

This study incorporates gender and work experience as demographic variables. Prior studies report gender differences in personality traits, work–life balance, conflicts, internet usage, and academic outcomes [89, 121]. Exploring gender as a moderating variable in the link between TL and empowerment is therefore warranted.

Sample

The study targeted employees in the IT sector in southern India, including Tata Consultancy Services, Infosys, Wipro, and Tech Mahindra. Data were collected post-pandemic, when social distancing protocols were still in effect, making online surveys via Google Forms the most feasible method, consistent with prior research [28, 89]. Lists of employees were obtained from organizations, and permission to email surveys was granted, with the research purpose clearly stated as academic.

A convenience sampling approach was used, sending surveys to 735 employees, yielding 256 completed responses (response rate: 34.8%). Google Forms prevented incomplete submissions, and non-response bias was assessed by comparing the first and last 50 respondents, revealing no significant differences.

Among respondents, 174 (68%) were male and 82 (32%) female. Age distribution included 85 (33.2%) under 25 years, 126 (49.2%) between 25–35 years, 31 (12.1%) between 35–45 years, 14 (5.5%) between 45–55 years, and 14 (5.5%) over 55 years. Regarding work experience, 85 (33.3%) had less than 5 years, 41 (16%) had 6–10 years, 71 (27.7%) had 11–15 years, and 59 (23%) had over 15 years.

Measures

The questionnaire was designed in two sections. The first section gathered respondents' demographic details, including age, gender, marital status, and tenure in their organization. The second section focused on the constructs under investigation.

All items were rated on a 5-point Likert scale, ranging from 1 ("strongly disagree") to 5 ("strongly agree").

Work engagement was assessed using six items from the Utrecht Work Engagement Scale (UWES) developed by Schaufeli and Bakker [49], covering three dimensions: vigor (two items), dedication (two items), and absorption (two items). The internal consistency of this scale was high, with a Cronbach's alpha of 0.91.

Transformational leadership was measured using six items from the Global Transformational Leadership (GTL) Scale by Carless *et al.* [94], which showed a reliability coefficient of 0.89.

Employee empowerment was evaluated through four items adapted from Chiles and Zorn [122] and Spreitzer *et al.* [67], with a Cronbach's alpha of 0.77.

Analysis and Findings

Confirmatory factor analysis and measurement model

Following Anderson and Gerbing's [123] recommended two-step procedure, the analysis began with assessing the measurement model before proceeding to evaluate the structural model. Confirmatory factor analysis (CFA) was performed using LISREL within the structural equation modeling (SEM) framework to examine the validity of the constructs. The CFA outcomes are summarized in **Table 1**.

Table 1. Confirmatory Factor Analysis

Construct and Source	Cronbach's α	Composite Reliability (CR)	Standardized Loading (λ)	Indicator Reliability (λ²)	Error Variance (Var(εi))	Average Variance Extracted (AVE)
Transformational Leadership [94]	0.89	0.92	–	–	–	0.66
My supervisor clearly communicates a positive and compelling vision	–	–	0.84	0.71	0.29	–
My supervisor treats employees individually, supporting their growth	–	–	0.83	0.68	0.32	–
My supervisor recognizes and encourages staff efforts	–	–	0.79	0.62	0.38	–
My supervisor promotes trust, engagement, and teamwork	–	–	0.78	0.61	0.39	–
My supervisor challenges employees to think innovatively and question assumptions	–	–	0.80	0.64	0.36	–
My supervisor demonstrates values consistently through actions	–	–	0.83	0.70	0.30	–
Empowerment [67, 122]	0.77	0.93	–	–	–	0.76
I feel capable of performing tasks required for my role	–	–	0.90	0.80	0.20	–
I feel adequately prepared to execute my job responsibilities	–	–	0.86	0.73	0.27	–
My manager trusts me to make the right decisions at work	–	–	0.85	0.71	0.29	–
I have substantial autonomy in determining how I carry out my job	–	–	0.88	0.78	0.22	–
Work Engagement [49]	0.91	0.93	–	–	–	0.69
I feel full of energy in my work	–	–	0.86	0.74	0.26	–
I feel strong and vigorous while performing my job	–	–	0.82	0.67	0.33	–
The work I perform is meaningful and purposeful	–	–	0.89	0.79	0.21	–
I take pride in the work I accomplish	–	–	0.86	0.74	0.26	–
I feel joyful when deeply engaged in work	–	–	0.80	0.64	0.36	–
Time passes quickly when I am focused on my work	–	–	0.77	0.59	0.41	–

As presented in **Table 2**, the standardized factor loadings for all items ranged from 0.77 to 0.90, exceeding the commonly accepted threshold of 0.70. The Cronbach's alpha values for the three constructs were all above 0.70 (ranging from 0.77 to 0.91), confirming their reliability. Composite reliability (CR) values fell between 0.92 and 0.93, while the average variance extracted (AVE) for each construct ranged from 0.66 to 0.76, surpassing the recommended minimum of 0.50. These results collectively support the internal consistency, convergent validity, and overall reliability of the constructs employed in this study [124, 125].

Table 2. Descriptive statistics: means, standard deviations, and zero-order correlations

	Mean	Standard Deviation	1	2	3	4	5
1. Gender	1.32	0.47	1				
2. Work experience	3.41	1.17	− 0.29***	1			
3. TL	3.71	0.76	0.021	0.19***	1		
4. Empowerment	3.81	0.74	−0.043	0.014	0.16***	1	
5. WE	4.02	0.63	−0.15*	0.18***	0.51***	0.22***	1

*** $p < 0.01$; * $p < 0.05$.

Gender: 1 = Male; 2 = Female.

Work experience: 1= Less than 2 years; 2 = 3–5 years; 3 = 6–10 years; 4 = 11–15 years; 5 = Above 15 years.

Convergent validity, discriminant validity, and common method bias

Discriminant validity was evaluated by comparing the square roots of the constructs' AVEs with the correlations among the variables, following the approach suggested by Fornell and Larcker [124]. For transformational leadership (TL) and empowerment, the square roots of AVE were 0.81 and 0.87, exceeding their correlation of 0.16. Likewise, TL and work engagement (WE) had AVE square roots of 0.81 and 0.83, which were higher than the correlation of 0.51. This pattern was consistent across all variables, confirming that each construct is distinct from the others.

The results of confirmatory factor analysis (CFA) demonstrated that the proposed three-factor structure fit the data well, with χ^2 = 269.19, df = 101, χ^2/df = 2.66, RMSEA = 0.074, RMR = 0.031, SRMR = 0.050, CFI = 0.93, and GFI = 0.89. The fit indices indicate a satisfactory model fit, consistent with recommended thresholds [126].

To assess potential common method variance, Harman's single-factor test was conducted. The analysis revealed that one factor accounted for 39.51% of the total variance, which is below the 50% criterion, suggesting that common method bias is not a concern in this dataset [125].

Descriptive statistics and multicollinearity

Descriptive statistics for the study variables are presented in **Table 2**. Multicollinearity was evaluated by examining correlations and variance inflation factors (VIFs). Correlation coefficients were all below 0.75, indicating that multicollinearity is unlikely [127]. Additionally, all VIF values were under the threshold of 5, further supporting the absence of multicollinearity issues [128]. The detailed VIF values are provided in Appendix A.

Hypothesis testing

Hypotheses H1 through H4 were tested using the PROCESS macro (model 4) in accordance with Hayes [129], and the outcomes are summarized in **Table 3**.

Table 3. Testing H1, H2, H3, and H4

	DV= WE				DV = Empowerment H2				DV = WE			
	Step 1				Step 2				Step 3			
	Coeff	se	t	p	Coeff	se	t	p	Coeff	se	t	p
Constant	2.4694	0.1686	14.6461	0.0000	3.2326	0.2273	14.2186	0.0000	2.0824	0.2234	9.3202	0.0000
TL H1	**0.4172**	**0.0445**	**9.3782**	**0.0000**	**0.1560**	**0.0600**	**2.5997**	**0.0099**	0.3985	0.0446	8.9415	0.0000
Empowerment H3									**0.1197**	**0.0460**	**2.6019**	**0.0098**
R-square	0.257				0.161				0.276			
F	87.95				16.75				48.35			
df1	1				1				2			
df2	254				254				253			
p	0.0000				0.0099				0.0000			

Total Effect						
	Total Effect	**se**	**t**	**p**	**LLCI**	**ULCI**
	0.4172	0.0445	9.3782	0.0000	0.3296	0.5048

Direct Effect						
	Direct Effect	**se**	**t**	**p**	**LLCI**	**ULCI**
TL→ WE	0.3986	0.0446	8.9415	0.0000	0.3108	0.4863

Bootstrapping Indirect Effect (H4) (To verify mediation)

	Indirect Effect	BOOT se	BOOT LLCI	BOOT ULCI
TL →Empowerment→WE	0.0187 [0.1560 × 0.1197 = 0.0187]	0.0112	0.0013	0.0447

Notes: The sample size was N = 256. Bootstrapped confidence intervals are reported as Boot LLCI (lower limit) and Boot ULCI (upper limit), based on 20,000 bootstrap samples [p < .05]. Reporting values to four decimal places is recommended, as some estimates may be very close to zero.
Hypothesis 1 proposes a positive relationship between transformational leadership (TL) and work engagement (WE).

Step 1 **(Table 3)** indicates that transformational leadership (TL) has a positive and statistically significant effect on work engagement (WE), with a regression coefficient of β = 0.417, t = 9.37, p < 0.001. The results from 20,000 bootstrap samples show that the 95% bias-corrected confidence interval (BCCI) ranged from 0.3296 (LLCI) to 0.5048 (ULCI), which does not include zero, thus providing support for Hypothesis 1.

Hypothesis 2 predicted a positive association between TL and employee empowerment. Step 2 **(Table 3)** shows that TL significantly predicts empowerment (β = 0.156, t = 2.59, p < 0.001), with a 95% BCCI ranging from 0.0291 to 0.2103, confirming Hypothesis 2.

Hypothesis 3 posited that empowerment positively influences WE. As shown in Step 3 **(Table 3)**, the regression coefficient for empowerment on WE was significant (β = 0.119, t = 2.60, p < 0.01), supporting Hypothesis 3.

For Hypothesis 4, which proposed that empowerment mediates the relationship between TL and WE, the indirect effect was examined. The analysis revealed an indirect effect of 0.0187 (Boot SE = 0.0112; Boot LLCI = 0.0013; Boot ULCI = 0.0447). Since the confidence interval does not include zero, this provides evidence supporting the mediation hypothesis.

To further validate this, the total effect of TL on WE was calculated as 0.4172, which is the sum of the direct effect (0.3985) and the indirect effect (0.0187). The indirect effect corresponds to the product of the regression coefficient of TL on empowerment (0.1560) and the coefficient of empowerment on WE (0.1197), i.e., 0.1560 × 0.1197 = 0.0187. The significance of this indirect pathway confirms the mediation effect of empowerment, supporting Hypothesis 4.

Testing the moderation of work experience (H1a)
To examine Hypothesis 1a, which posited that work experience moderates the TL–WE relationship, Hayes' [129] PROCESS macro (model 1) was applied, with the results summarized in **Table 4**.

Table 4. Testing of hypothesis 1a (two-way interaction) Hayes (2018) PROCESS macros (model number 1)

Variables	Coeff	se	t	p	LLCI	ULCI
DV=WE						
Constant	1.4017	0.4938	2.8388	0.0049	0.4293	2.3741
TL	0.6682	0.1345	4.9685	0.0000	0.4033	0.9331
Work experience	0.3415	0.1444	2.3655	0.0188	0.0572	0.6258
TL x Work experience **H1a**	**−0.0802**	**0.0384**	**−2.0853**	**0.0380**	**−0.1559**	**−0.0045**
R-square	0.278					
F	32.17					
df1	3					
df2	252					
p	0.0000					
Conditional effects of the focal predictor at values of moderator (Work experience)						
Work experience	Effect	se	t	p	LLCI	ULCI
3–5 years	0.5078	0.0671	7.5697	0.0000	0.3757	0.6400
11–15 years	0.3475	0.0524	6.6359	0.0000	0.2444	0.4506
Over 15 years	0.2673	0.0794	3.3684	0.0009	0.1110	0.4236

Hypothesis H1a proposed that work experience moderates the relationship between transformational leadership (TL) and work engagement (WE). As indicated in **Table 4**, the interaction term between TL and work experience was statistically significant (β = −0.080, t = −2.08, p < 0.05), with a 95% bootstrapped confidence interval of −0.1559 (LLCI) to −0.0045 (ULCI). The negative sign of the interaction coefficient confirms support for H1a. The nature of this moderation effect is illustrated in **Figure 2**, which depicts the two-way interaction.
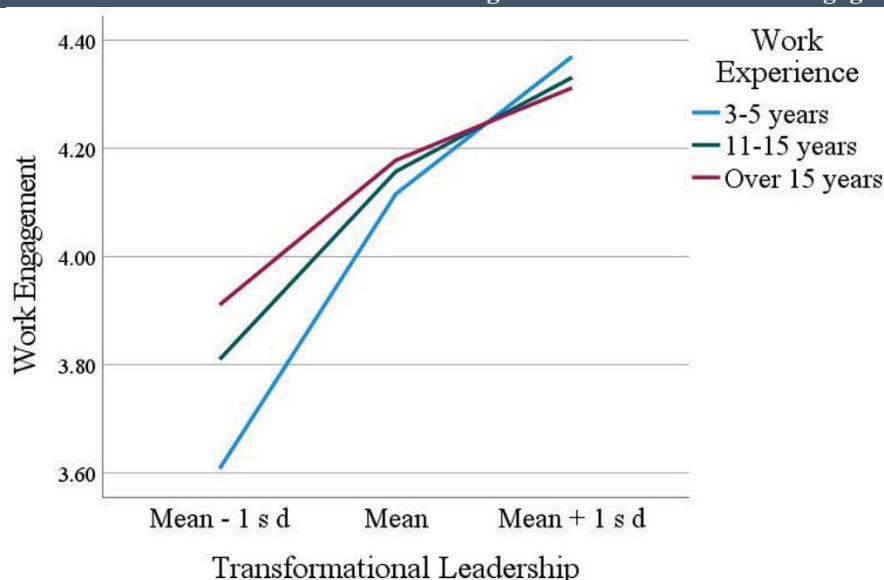
Figure 2. Work experience as a moderator in the relationship between TL and WE

Figure 2 illustrates how work experience moderates the relationship between transformational leadership (TL) and work engagement (WE). As shown, employees with 3–5 years of experience exhibit lower levels of WE at low TL compared to those with 11–15 years or more than 15 years of experience. However, the figure also shows that as TL increases, employees with greater work experience do not consistently display higher WE. These findings suggest that TL has a stronger impact on employees with less experience, and therefore, Hypothesis H1a is not supported.

Hypothesis H2a proposed that gender moderates the relationship between TL and employee empowerment. To examine this, Hayes' [129] PROCESS macro (model 1) was employed, with the results presented in **Table 5**.

Table 5. Testing of hypothesis 2a (two-way interaction) Hayes [129] PROCESS macros (model number 1)

DV= Empowerment						
Variables	**Coeff**	**se**	**t**	**p**	**LLCI**	**ULCI**
Constant	1.4580	0.6753	2.1592	0.0318	0.1282	2.7879
TL	0.6595	0.1783	3.6998	0.0003	0.3085	1.0106
Gender	1.2812	0.4635	2.7644	0.0061	0.3684	2.1939
TL x Gender **H2a**	**−0.3639**	**0.1218**	**−2.9888**	**0.0031**	**−0.6037**	**−0.1241**
R-square	0.247					
F	54.89					
df1	3					
df2	252					
p	0.001					
Conditional effects of focal predictor at value of the moderator (Gender)						
Gender	**effect**	**s.e**	**t**	**p**	**Boot LLCI**	**Boot ULCI**
Male	0.2956	0.0752	3.9325	0.0001	0.1476	0.4437
Female	−0.0683	0.0958	−0.7131	0.4764	−0.2569	0.1203

The analysis revealed that the interaction between transformational leadership (TL) and gender was significant ($\beta = -0.364$, $t = -2.98$, $p < 0.05$). Based on 20,000 bootstrap samples, the 95% bias-corrected confidence interval ranged from −0.6037 (LLCI) to −0.1241 (ULCI), which does not include zero, providing support for Hypothesis H2a. The interaction model was significant and accounted for 24.7% of the variance in empowerment ($R^2 = 0.247$; $F(3, 252) = 54.89$, $p < 0.001$). Conditional effects of TL at different levels of the moderator (gender) are presented at the bottom of **Table 4**, and the interaction effect is visually depicted in **Figure 3**.
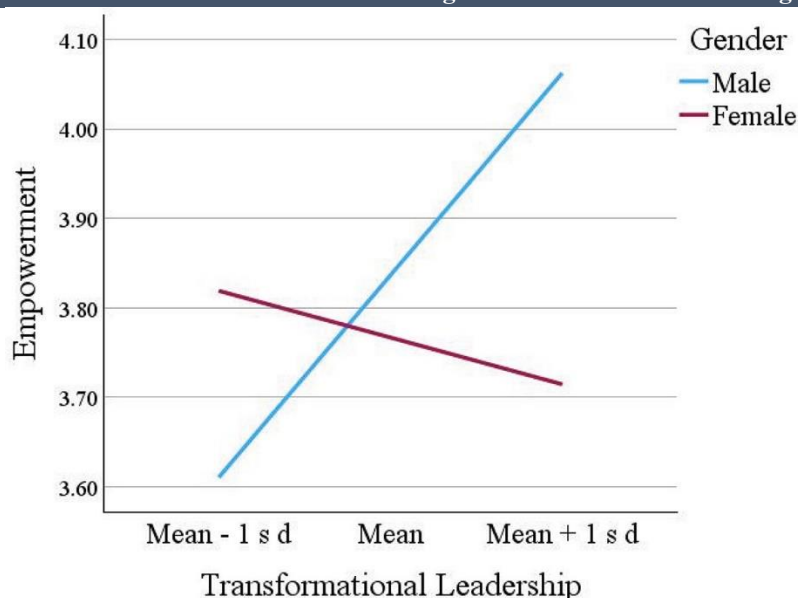
Figure 3. Gender as a moderator between TL and empowerment

Figure 3 illustrates the moderating effect of gender on the relationship between transformational leadership (TL) and work engagement (WE). At lower levels of TL, females exhibit higher WE compared to males. However, as TL increases from low to high, WE tends to decline for females while it rises for males. The opposite slopes for males and females provide support for the proposed moderation effect, confirming Hypothesis H2a.

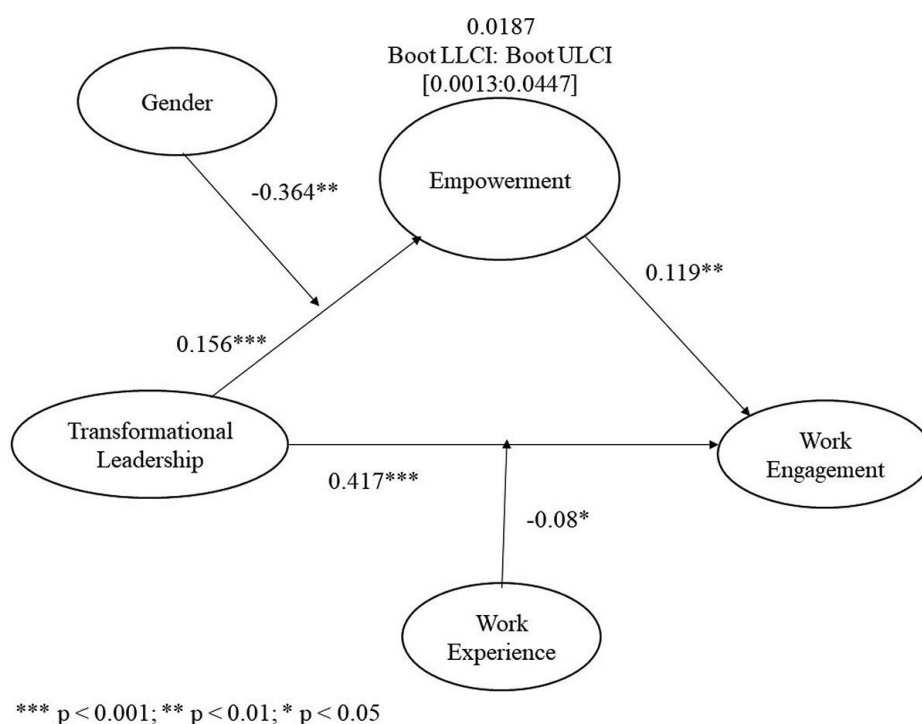The complete empirical model is depicted in **Figure 4**.

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Figure 4. Empirical model

Discussion

This study developed a conceptual framework and empirically tested the hypothesized relationships using data from 256 IT sector employees. After confirming the reliability and validity of the measurement instruments, Hayes' [129] PROCESS macro was employed to evaluate the hypotheses, and most were supported.

First, a positive relationship between transformational leadership (TL) and work engagement (WE) (H1) was observed, which aligns with previous research [65, 130]. All TL dimensions—intellectual stimulation, individualized consideration, idealized influence, and inspirational motivation—appear to contribute to higher employee engagement, consistent with the theoretical foundations of the Full Range Leadership Theory (FRLT) and the Job Demands–Resources (JD-R) model. Second, TL was

positively associated with employee empowerment (H2), corroborating prior studies [69, 70]. Third, empowerment was found to significantly predict WE (H3), reflecting extant evidence that empowered employees are more engaged in organizational tasks [75, 131]. Fourth, the positive effect of TL on WE was partially mediated by employee empowerment (H4), supporting the notion that leaders enhance engagement through empowerment mechanisms, consistent with earlier research [73, 76].

Regarding moderation, the influence of work experience on the TL–WE relationship (H1a) was not supported. Contrary to expectations, TL had a stronger impact on employees with lower experience, suggesting that less experienced staff are more responsive to transformational leadership. For employees with greater experience, the effect of TL was less pronounced when engagement was already low. Conversely, gender significantly moderated the relationship between TL and empowerment (H2a), supporting the notion that leadership impacts men and women differently in organizational settings [90, 93]. Overall, the proposed conceptual model yielded meaningful insights into the interplay between leadership, empowerment, engagement, experience, and gender.

Theoretical implications

This research contributes to leadership and human resource management literature in multiple ways. First, it extends the body of knowledge on transformational leadership within the FRLT framework. Second, the findings highlight the role of WE as a key mechanism linking leadership to positive employee outcomes, reinforcing its status as a precursor to performance, productivity, and job satisfaction, as documented in prior research. Third, employee empowerment emerged as an important determinant of WE, emphasizing the role of managers in enabling employees to take initiative and assume responsibility. Fourth, the study shows that transformational leaders can enhance engagement among less experienced employees by fostering empowerment, whereas TL has limited influence on highly experienced staff in this regard.

Fifth, the research highlights gender-specific responses to leadership. Male employees tended to benefit more from TL in terms of empowerment, whereas female employees experienced a negative impact, suggesting that leaders must consider gender differences when assigning responsibilities or promoting empowerment. The conceptual model, while modest in contribution, provides empirical support for these nuanced effects in organizational contexts.

Practical implications

The findings offer actionable insights for managers, particularly in developing countries such as India. First, in the post-pandemic "new normal," transformational leadership is critical for restoring employee engagement, especially given the widespread stress and burnout experienced during the pandemic [89, 132]. Second, managers should implement empowerment practices by delegating authority and encouraging employees to contribute innovative ideas, as empowerment directly influences engagement. Third, less experienced employees are particularly responsive to TL and can serve as effective conduits for transmitting organizational vision to others; thus, managers should consider distributing challenging responsibilities to them. Fourth, gender differences should be acknowledged in leadership and empowerment practices, ensuring equitable opportunities while considering how male and female employees respond differently to transformational initiatives. Overall, the study underscores the importance of transformational leadership in promoting engagement and productivity, providing practical guidance for enhancing employee outcomes in contemporary workplaces.

Limitations and directions for future research

The findings of this study should be considered in light of several limitations. First, the sample was drawn exclusively from the IT sector, which may restrict the generalizability of the results to other industries such as healthcare or manufacturing. Nonetheless, the findings are likely transferable to sectors with similar working conditions. Second, the study was conducted in a developing country, India, and cultural and organizational differences may result in different TL–WE dynamics in developed nations. Third, as with most survey-based research, social desirability bias could have influenced responses, although steps were taken to minimize this risk by anonymizing participant responses [133]. Fourth, the study focused on a limited set of variables—TL, empowerment, work experience, and gender—potentially overlooking other factors affecting work engagement. Fifth, the influence of transactional leadership was not examined, despite research suggesting that task-oriented, reward-contingent behaviors characteristic of transactional leadership may also impact WE [8].

Sixth, as noted by van Knippenberg and Sitkin (2013), the multi-dimensional conceptualization of TL has inherent challenges. The combination of TL dimensions lacks robust empirical justification, and the literature provides limited insight into how individual dimensions specifically influence outcomes. Despite these critiques, TL has been widely used to study employee engagement and commitment [8].

This study also opens several avenues for future research. Larger and more geographically diverse samples across India could enhance generalizability. Future studies might include variables such as emotional intelligence, psychological capital, or emotional exhaustion to better understand predictors of WE. Investigating antecedents of employee empowerment could help transformational leaders target interventions more effectively. The effects of tenure, age, and work experience on WE and empowerment warrant further exploration [134]. Beyond gender and experience, researchers could examine factors such as

work–family conflict, quality of work life, and performance feedback, which may significantly influence engagement, productivity, and performance [135, 136]. Additionally, employee compassion could be studied as a moderator in the TL–empowerment–WE relationship, as it may drive prosocial behavior within organizations [137]. Other leadership styles, including servant leadership, could also be explored for their impact on organizational citizenship behavior, team performance, and creativity [41, 138]. Comparative studies across developing nations such as Pakistan, Bangladesh, and Sri Lanka could further enrich the understanding of TL's influence in diverse organizational contexts.

Conclusion

Organizations globally have undergone profound transformations to recover from the prolonged disruptions caused by the pandemic. This study provides new insights into managing business operations in the post-pandemic "new normal," emphasizing the role of transformational leadership (TL) in promoting work engagement (WE) through employee empowerment. Given that returning to pre-pandemic operational norms may take considerable time, organizations must adopt innovative strategies to regain lost ground. Sustained commitment from top management toward fostering TL is critical, and it is anticipated that TL, a leadership approach that emerged nearly three decades ago, will continue to be a focal point for research and practice in organizational behavior.

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