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Transformational Leadership and Project Success: Mediating Role of Team-Building and Moderating Effect of Top Management Support

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ABSTRACT

This study investigates the influence of transformational leadership (TL) on project success (PS), highlighting team building (TB) as a mediating factor and top management support (TMS) as a conditional moderator. Surveying 534 Tunisian project managers from different industrial sectors, the results show that TL enhances PS both directly and indirectly through TB. Notably, TMS significantly strengthens this relationship in low-support contexts, although its effect diminishes when organizational support is average or high. The findings emphasize the importance of cultivating TL skills among project managers to foster collaboration, innovation, and collective commitment within project teams. Additionally, proactive top management involvement is crucial, particularly in resource-constrained environments. Integrating effective team-building strategies, such as clear goal setting, role clarification, and trust development, with leadership and organizational support optimizes project outcomes and operational effectiveness. This research contributes to project management literature by linking leadership behaviors, team dynamics, and organizational support within an integrated framework, offering valuable guidance for improving leadership effectiveness, managerial decision-making, and project performance across diverse organizational environments.

Keywords: Transformational leadership, Team-building, Top management support, Project success.

Introduction

In recent decades, project success (PS) has emerged as a central concern in project management research, with extensive literature examining the determinants of successful project outcomes (Ika *et al*., 2012; Unterhitzenberger & Bryde, 2019). Among these determinants, leadership style, particularly transformational leadership (TL), has been consistently identified as a key driver of organizational performance and project effectiveness (Turner & Müller, 2005; Hassan *et al*., 2017; Podgorska & Pichlak, 2019). Transformational leaders inspire and motivate their teams by fostering environments that promote creativity, collaboration, and innovation, which are essential for navigating complex and dynamic projects (Bass & Riggio, 2006; Burke *et al*., 2006; Nauman *et al*., 2022). Despite strong empirical evidence supporting the positive influence of TL, the mechanisms through which leadership translates into PS and the contextual conditions that shape this relationship remain insufficiently understood, particularly regarding the mediating role of team-building (TB) and the moderating role of top management support (TMS).

TL is widely regarded as a critical driver of PS because it enhances both organizational performance and team dynamics (Aarseth *et al*., 2016; Aga *et al*., 2016; Maqbool *et al*., 2017; Müller *et al*., 2018). By fostering trust, shared vision, and alignment with project objectives, TL strengthens team cohesion and reduces ambiguity, enabling diverse teams to collaborate effectively toward common goals (Munyeki & Were, 2017; Raziq *et al*., 2018). Prior studies have shown that TL promotes knowledge sharing, problem solving, and effective change management, which are particularly important in project-based organizations where cross-functional coordination and adaptability are essential for meeting milestones and sustaining performance (McDonough, 2000; Sohmen, 2013; Aga *et al*., 2016).

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Beyond direct leadership effects, TB represents a vital mechanism through which TL influences PS. TB practices, such as goal setting, role clarification, and problem solving, enhance team cohesion, communication, and mutual accountability, thereby facilitating effective project execution (Burke *et al*., 2006; Klein *et al*., 2009). Transformational leaders reinforce these processes by aligning team dynamics with project goals and empowering members to take ownership of their responsibilities (Aga *et al*., 2016; Nauman *et al*., 2022). Effective TB depends on leaders' capacity to foster engagement, accountability, and shared purpose, translating motivational leadership into tangible operational outcomes (McDonough, 2000; Gundersen *et al*., 2012; Kastrup, 2019; Ali *et al*., 2021b).

At the organizational level, TMS further strengthens the pathways linking TL, TB, and PS by providing strategic direction, resources, and cultural legitimacy. Drawing on Conservation of Resources (COR) theory, TMS can be conceptualized as a "resource convoy" that equips transformational leaders with the capacity to mobilize material and social resources, address challenges, and align project efforts with organizational priorities (Hobfoll, 1989, 2011; Kanwal *et al*., 2017; Hobfoll *et al*., 2018). TMS amplifies the TL–TB relationship by fostering trust, role clarity, and goal alignment, which support high-performing teams (Klein *et al*., 2009; Ahmed *et al*., 2016). It also conditions the extent to which TB translates into PS by ensuring adequate resourcing and strategic coherence. In resource-scarce environments, TMS compensates for structural constraints and strengthens cohesion, whereas in resource-rich environments it sustains innovation and collaboration (Santos-Vijande *et al*., 2018; Nauman *et al*., 2022). This dynamic interaction highlights the importance of integrating leadership, team processes, and organizational support to optimize project outcomes.

Grounded in COR theory, this study investigates how TL drives PS by examining TB as a mediating mechanism and TMS as a conditional moderator. Specifically, the research explores the direct impact of TL on PS, the mediating role of TB in linking leadership behaviors to team dynamics, and the moderating effects of TMS on the TL–PS, TL–TB, and TB–PS relationships. Furthermore, it analyzes how TMS conditionally shapes the indirect TL–PS pathway by bridging resource gaps and reinforcing alignment between team efforts and project objectives (Müller & Turner, 2010; Fareed *et al*., 2023).

This study contributes to project management literature by providing empirical evidence on the integrated effects of leadership, team-building, and organizational support within a unified framework. By examining TB and TMS simultaneously, the study addresses important gaps in understanding the mechanisms and boundary conditions through which TL enhances PS, offering both theoretical insights and practical implications for project managers and organizational leaders.

The remainder of this paper is organized as follows. Section 2 develops the hypotheses and research model, Section 3 outlines the methodology, Sections 4 and 5 present the results and discussion, and Section 6 concludes with implications, limitations, and directions for future research.

Hypotheses Development and Research Model

TL and PS

TL is well recognized as an important feature in PS, with extensive research demonstrating its impact on organizational outcomes and project performance (Sohmen, 2013; Aga *et al*., 2016; Aarseth *et al*., 2016; Müller *et al*., 2018; Kabore *et al*., 2021; Nauman *et al*., 2022). Transformational leaders inspire cognitive and behavioral changes in team members while also encouraging cooperation, innovation, and goal alignment, all of which are necessary for managing project difficulties (Burke *et al*., 2006; Sohmen, 2013; Aarseth *et al*., 2016). TL uses Social Information Processing theory to help leaders motivate teams, promote synergy, and align efforts to achieve project goals (Hoegl & Parboteeah, 2007; Nauman *et al*., 2022).

In project-based organizations, TL addresses the challenge of managing diverse teams by promoting loyalty, adaptability, and creativity (Aga *et al*., 2016; Munyeki & Were, 2017; Ali *et al*., 2021b). It enhances knowledge sharing, stakeholder satisfaction, and team cohesion through shared understanding and open communication (Maqbool *et al*., 2017; Raziq *et al*., 2018). By inspiring ambitious goals, transformational leaders can improve project efficiency and trust (Zavari & Afshar, 2023). Based on this, we propose the following hypotheses:

Hypothesis 1*: TL positively influences PS.*

Mediating Role of TB

TL significantly affects PS by creating a collaborative environment, with TB serving as the mediating mechanism (Aga *et al*., 2016). TB interventions, such as goal setting, role clarification, and problem solving, enhance team cohesion, communication, and collaboration, which are key factors in successful project execution (Klein *et al*., 2009; Hsu *et al*., 2011; Nauman *et al*., 2022). Transformational leaders reinforce TB by crafting compelling visions that align team members with project objectives, foster a shared understanding, reduce ambiguity, and promote collective commitment (Aga *et al*., 2016; Braun *et al*., 2013; Sohmen, 2013).

Effective TB relies on leaders' capacity to empower teams, encourage initiative, and develop responsibility, all of which are critical for high performance (Staggers *et al*., 2008; Ali *et al*., 2021b). Empowered teams engage in proactive practices that promote PS (Yang *et al*., 2010; Hsu *et al*., 2011). Recent research has shown that TB interventions, such as role alignment and interpersonal trust building, improve cohesion and match individual efforts with project goals, guaranteeing that TL's motivational impact translates into tangible outcomes (Kastrup, 2019; Pollack & Matous, 2019). Transformational leaders also prepare their teams for problems by encouraging open communication and skill development (Nauman *et al*., 2022).

Moreover, TB addresses conflicts and clarifies roles, fostering a productive team dynamic (Hsu *et al*., 2011; Kissi *et al*., 2013). Even in high-performing teams, the absence of effective TB undermines PS, emphasizing its mediating role (Burke *et al*., 2006). Studies in the IT and construction sectors further validate the critical role of TB in managing complexity through collaboration and knowledge sharing (Gyanchandani, 2017; Zavari & Afshar, 2023). Therefore, we propose the following hypothesis:

Hypothesis 2: *TB mediates the relationship between TL and PS.*

Moderating Role of TMS

TMS is important for PS, especially as a mediator in the interaction between TL and PS (Islam *et al*., 2009; Ali *et al*., 2021a; Kanwal *et al*., 2017; Fareed *et al*., 2023). According to COR theory, TMS is viewed as a "resource convoy," allowing transformative leaders to effectively access and deploy strategic and material resources (Hobfoll *et al*., 2018). TMS improves the TL-PS relationship by offering advice, resource alignment, and a positive company culture (Müller & Turner, 2010; Fareed *et al*., 2023).

TL benefits significantly from TMS, as senior management ensures resource availability and alignment with project objectives, enabling leaders to inspire teams and manage complexities (Jensen, 2018; Fjendbo, 2021). TMS also enhances team motivation, prioritization, and execution of tasks, fostering an environment in which transformational leaders can maximize their capabilities (Yang *et al*., 2011; Santos-Vijande *et al*., 2018). Particularly in innovation-driven projects, TMS promotes collaboration and sustains cohesion (Boonstra, 2013).

However, TMS alone cannot ensure PS. Effective leadership must align with top management's expectations to integrate strategic directions with project goals (Ahmed *et al*., 2016; Hermano & Martín-Cruz, 2016). Together, TMS and TL mitigate risks and foster high-performing cultures characterized by motivation and organizational commitment (Kanwal *et al*., 2017; Ali *et al*., 2020). Therefore, we hypothesize as follows:

Hypothesis 3: *TMS moderates the relationship between TL and PS.*

TMS enhances the TL's ability to implement TB activities by fostering trust, cohesion, and collaboration (McDonough, 2000; Klein *et al*., 2009; Boonstra, 2013). By articulating organizational visions, TMS enables transformational leaders to clarify operational boundaries, empower teams to make decisions, and resolve issues autonomously (Burke *et al*., 2006; Sohmen, 2013).

Supportive top management promotes transparent communication and empowers transformational leaders to implement effective TB strategies. These strategies enhance motivation and align team efforts with the project objectives (Aga *et al*., 2016). Furthermore, mechanisms such as knowledge-sharing channels and resource provision foster environments in which teams collaborate effectively (Klein *et al*., 2009; Nauman *et al*., 2022). TMS allows leaders to focus on fostering cohesion and high performance (Yang *et al*., 2011).

Additionally, TMS reinforces interpersonal trust and role clarification, which are essential for successful TB (Wang & Zhu, 2018). Studies have shown that TMS strengthens the TL's capacity to align team dynamics with organizational

goals, emphasizing its role in high-performance environments (Seibert *et al*., 2004; Drouin *et al*., 2018). Hence, we suggest the following hypothesis:

Hypothesis 4*: TMS moderates the relationship between TL and TB.*

TMS has an important role in improving the interaction between TB and PS by ensuring resource availability, encouraging collaboration, and facilitating alignment with organizational goals (Hobfoll *et al*., 2018; Santos-Vijande *et al*., 2018). According to COR theory, TMS serves as a "resource caravan passageway," bringing material, human, and strategic resources required for effective TB behaviors like goal formulation, role definition, and problem solving (Klein *et al*., 2009; Aga *et al*., 2016). TMS fosters trust, openness, and mutual respect by addressing resource needs and reducing organizational obstacles, allowing team members to discuss ideas, resolve issues, and maintain cohesion in complicated projects (Burke *et al*., 2006; Potnuru *et al*., 2018).

In high-uncertainty environments, TMS fosters psychological safety, accelerates decision-making, and facilitates innovative problem solving (Wang & Zhu, 2018; Wiltshire *et al*., 2018; Blahun *et al*., 2022; Ferreira *et al*., 2022; Sanlier *et al*., 2022; Iriti *et al*., 2024; Malik *et al*., 2024; Souza *et al*., 2024). However, its role may vary based on project complexity and organizational alignment. In resource-rich environments, established TB norms may independently sustain performance, reducing reliance on TMS (Kerzner, 2017; Santos-Vijande *et al*., 2018). Accordingly, we propose the following hypothesis:

Hypothesis 5: *TMS moderates the relationship between TB and PS.*

TL, which emphasizes inspiring and motivating team members to achieve organizational goals, profoundly influences PS, particularly when it is mediated by TB. This influence was further moderated by TMS level. According to COR theory, TMS acts as a "resource caravan passageway," providing material, human, and strategic resources while ensuring the alignment of TB efforts with organizational goals (Hobfoll *et al*., 2018). This alignment is critical in environments that require cohesive team effort to overcome project complexities (Mallongi & Ernyasih, 2022; Roy *et al*., 2022; Padma *et al*., 2023). Effective TMS empowers transformational leaders to leverage resources efficiently, foster collaboration, minimize conflicts, and enhance TB dimensions, such as goal setting, interpersonal relationships, and problem solving (Klein *et al*., 2009; Santos-Vijande *et al*., 2018; Nauman *et al*., 2022).

TMS also fosters psychological safety, enabling teams to voice ideas and engage in collaborative problem-solving, which is critical for addressing challenges (Wang & Zhu, 2018). Conversely, in the absence of TMS, TL-driven TB efforts may falter owing to resource constraints and misalignments, underscoring the role of TMS in sustaining PS (Ali *et al*., 2021b; Fareed *et al*., 2023). Accordingly, we hypothesize as follows:

Hypothesis 6*: The conditional indirect effect of TL on PS, through TB, is moderated by TMS.*

Based on these assumptions, **Figure 1** presents the conceptual framework of the study.

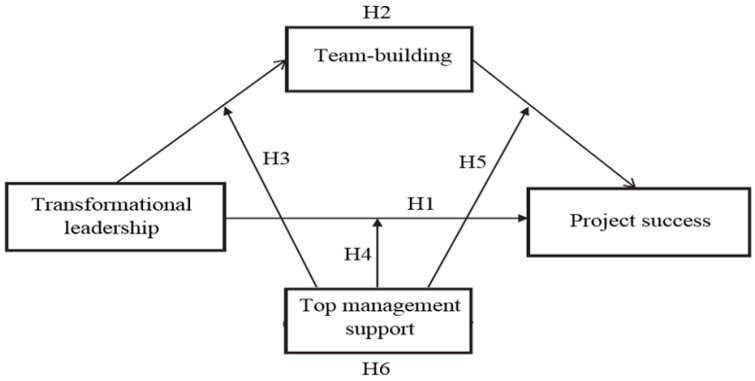

Figure 1. Proposed conceptual framework

Materials and Methods

Sample and Procedure

Convenience sampling was used to select Tunisian project managers from various sectors, with one project per organization as the unit of analysis. Convenience sampling is an appropriate choice when dealing with an unknown

population size because it allows for the selection of easily accessible participants who meet the study criteria (Sekaran & Bougie, 2016). The key informants were project managers, chosen because of their pivotal role in determining project outcomes, in line with prior research emphasizing the significance of leadership in PS (Kissi *et al*., 2013; Aga *et al*., 2016; Maqbool *et al*., 2017).

Data were collected through an online survey using Google Forms, distributed between June and December 2024. Of the 800 distributed questionnaires**,** 534 were retained for analysis. The use of a single project per respondent ensures that each manager reflects on a specific project, thus avoiding confusion arising from the simultaneous consideration of multiple projects. This method enhances the internal validity of the findings by capturing project-specific data, in line with previous studies on leadership and PS (Maqbool *et al*., 2017).

The study sample was diverse in terms of sex, age, and educational qualification. Male respondents constituted the majority (82.0%) of the sample, with females representing 18.0% of the sample. Participants' ages ranged across three categories: 22.7% were between 25 and 34 years old, 52.4% were between 35 and 45 years old, and 24.9% were over 45 years old. Regarding educational attainment, 77.0% held a bachelor's degree, 13.7% completed a master's or doctoral degree, and 9.3% were undergraduates.

Data Analysis

Statistical analysis was conducted using the Minitab 19 software to examine the relationships among the study variables, including the direct and indirect effects of TL on PS, the mediating role of TB, and the moderating effect of TMS. Minitab's robust regression tools were leveraged to assess these relationships, aligned with the study's focus on quantifying the impact of leadership behaviors and organizational support on project outcomes (Makhdoom *et al*., 2022; Özüdoğru & Tosun, 2022; Sedova, 2022; Meneses-La-Riva *et al*., 2023; Cantile *et al*., 2024; Endeshaw *et al*., 2024).

Measures

The questionnaire contained validated scales for measuring the TL, TB, TMS, and PS. These criteria were assessed using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The TL (13 items), TB (17 items), and PS (14 items) scales were modified from Aga *et al*. (2016), while TMS was measured using a 6-item scale from Islam *et al*. (2009). Gender, age, and educational qualifications were chosen as control variables since they have been shown to have an impact on PS.

Results and Discussion

Reliability, Validity, and Structural Model Fit

Exploratory Factor Analysis (EFA) was conducted using the principal component extraction method with varimax rotation to enhance factor differentiation and optimize the model fit. The conditions for EFA were met with an excellent Kaiser-Meyer-Olkin index of 0.765 (above the 0.7 threshold) and a significant Bartlett's test of sphericity ($\chi^2 = 1324.762$, df = 497, p = 0.000).

To further evaluate reliability and validity, **Table 1** presents the values for Cronbach's alpha, composite reliability (ρ of DG), Jöreskog's Rho, and Average Variance Extracted (AVE) for each variable. The Cronbach's alpha surpassed the acceptable threshold of 0.7 for all variables, confirming internal consistency. The composite reliability exceeded the threshold of 0.5 for all variables, indicating an acceptable reliability. The Rho values of Jöreskog were above 0.7, demonstrating strong variable reliability. The AVE values were above the benchmark of 0.5, confirming adequate convergent validity based on the criteria established by Fornell and Larcker (1981). These findings collectively validate the effectiveness of the measurement model.

Table 1. Variables' validity and reliability

Variable	Cronbach's Alpha	ρ of DG	Jöreskog's Rho	AVE
TL	0.801	0.613	0.797	0.646
TMS	0.854	0.576	0.835	0.619
TB	0.763	0.529	0.812	0.553

PS	0.712	0.538	0.798	0.793

Table 2 presents the intercorrelations among the variables and confirms discriminant validity following Fornell and Larcker's (1981) criterion (Elmeged & Alzahrani, 2022; Delgado-Montemayor *et al*., 2024). The diagonal values, representing the square root of the AVE, exceeded the correlations with other variables. For instance, the AVE square root for TL was 0.804, which surpassed its correlation with TMS (0.231), TB (0.167), and PS (0.389), thus affirming the empirical distinctiveness of the variables. Significant correlations were observed between the TL-PS ($r = 0.389$, $p < 0.001$), TB-PS ($r = 0.408$, $p < 0.001$), and TMS-TB ($r = 0.321$, $p < 0.001$).

Table 2. Intercorrelations and discriminant validity[a]

Variable	TL	TMS	TB	PS
TL	(0.804)			
TMS	0.231**	(0.787)		
TB	0.167*	0.321***	(0.744)	
PS	0.389***	0.199*	0.408***	(0.891)

Note (s): N = 534. [a]AVE square root values on the diagonal, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$

To assess the structural model's fit, incremental, parsimonious, and absolute indices were used. Confirmatory factor analysis found that the tested measurement model had excellent fit indices that matched the thresholds proposed by Hair *et al*. (2010). The CMIN/DF ratio of 1.856 was in the optimal range of 1-3, indicating a good fit. Additional measures, including RMSEA (0.043), PClose (0.542), SRMR (0.068), GFI (0.918), and CFI (0.948), verified the model's robustness and suitability for testing the hypotheses.

Mediation Analysis of TB

The mediation study in **Tables 3 and 4** demonstrates TB's involvement as a mediator between TL and PS, supporting Hypotheses H1 and H2. TL significantly impacted PS ($\beta = 0.276$, $t = 1.98$, $p < 0.05$), supporting Hypothesis H1. Furthermore, the indirect impact ($\beta = 0.217$, $t = 1.77$, $p < 0.05$) highlights the mediating function of tuberculosis. The total effect ($\beta = 0.587$, $t = 4.64$, $p < 0.001$) showed a complementary connection, with TB magnifying the effect of TL on PS. The indirect effect of TL on PS via TB was significant (effect = 0.127, Boot LLCI = 0.026, Boot ULCI = 0.134), with a confidence interval that excluded zero. These findings support Hypothesis H2, demonstrating that TL not only has a direct influence on PS but also an indirect effect via TB.

Table 3. Linear regression analysis

Path	β	t-stat	p-value
Direct Effect (TL → PS, no mediator)	0.276	1.98**	0.038
Indirect Effect (via TB)	0.217	1.77**	0.017
Total Effect (TL → PS)	0.587	4.64***	0.000

Note (s): * $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$

Table 4. Mediation analysis

TL → TB → PS	Effect	Boot LLCI	Boot ULCI
Indirect Effect	0.127	0.026	0.134

Note(s): Bootstrap Samples: 10,000, LLCI = Lower Level Confidence Interval, ULCI = Upper Level Confidence Interval

Moderation Analyses of TMS

The moderation analyses presented in **Table 5** generated using MINITAB 19 software, confirmed the moderating role of TMS in the relationships between TL, TB, and PS, validating Hypotheses H3 and H4. For Hypothesis H3, TMS significantly moderated the TL–PS relationship ($\beta = 0.399$, $t = 3.242$, $p < 0.001$) with a strong model fit ($R^2 = 0.352$; $F(6,508) = 17.39$, $p < 0.001$). Similarly, Hypothesis H4 is supported, as TMS moderates the TL–TB relationship ($\beta =$

0.563, t = 4.004, p < 0.001; R^2 = 0.287). However, Hypothesis H5 was not supported, as TMS did not significantly moderate the TB–PS relationship (β = 0.023, t = 0.156, p = 0.899).

Table 5. Moderation analyses

	Variable	β	t-stat	p-value
Moderating Role of TMS in TL-PS	**TMS**	0.329	2.634***	0.002
	TL	0.212	1.845**	0.044
	Interaction (TL × TMS)	0.399	3.242***	0.000
	Age	-0.0233	-1.006	0.488
	Gender	0.151	1.770*	0.082
	Education	-0.009	-0.934	0.007
	Model fit statistics: R^2 = 0.352; F(6,508) = 17.39, p < 0.001			
	Variable	**β**	**t-stat**	**p-value**
Moderating Role of TMS in TL-TB	**TMS**	0.197	1.884**	0.042
	TL	0.299	2.177***	0.011
	Interaction (TL × TMS)	0.563	4.004***	0.000
	Age	-0.092	-1.157	0.165
	Gender	0.165	1.790*	0.068
	Education	-0.929	-1.067	0.387
	Model fit statistics: R^2 = 0.287; F(6,508) = 13,31 p < 0.001			
	Variable	**β**	**t-stat**	**p-value**
Moderating Role of TMS in TB-PS	**TMS**	0.098	1.578	0.158
	TB	0.634	7.980***	0.000
	Interaction (TB × TMS)	0.023	0.156	0.899
	Age	0.657	8.340***	0.000
	Gender	-0.178	1.744*	0.055
	Education	0.034	0.876	0.922
	Model fit statistics: R^2 = 0.192; F(6,508) = 10.09, p < 0.05			

Note (s): * p < 0.10, ** p < 0.05, *** p < 0.001

Conditional Indirect Effects of TMS

Finally, to examine the conditional indirect effect of TMS, we employed the PROCESS macro, developed by Hayes (2015). The number of bootstrap samples was set to 10,000 to estimate confidence intervals, as recommended by Baron and Kenny (1986). The results in **Table 6** reveal that at low TMS (-1SD), the conditional indirect effect is significant (Effect = 0.131, 95% CI [0.056, 0.156]), showing that TMS enhances the mediating role of TB when support is limited. However, on average (Effect = 0.337, 95% CI [-0.078, 0.364]) and at high TMS levels (Effect = 0.127, 95% CI [-0.012, 0.198]), the confidence intervals were zero, indicating non-significant effects. These results partially validated Hypothesis H6, demonstrating that TMS is most impactful in low-support environments.

Table 6. Conditional indirect effects of TMS

Mediator	Moderator	Effect	Confidence Interval 95%	
			Boot LLCI	Boot ULCI
TB	-1SD	0.131	0,056	0 ,156
TB	Mean	0.337	-0,078	0,364
TB	+1SD	0.127	-0,012	0,198

Note(s): SD = Standard Deviation

This study delves deeply into the link between TL and PS, focusing on the mechanisms and contextual elements that influence it. While previous research has extensively shown the direct influence of TL on PS and the mediating role of TB, this discussion focuses on the moderating role of TMS and investigates how it boosts or reduces the effectiveness of TL and TB under diverse scenarios.

Hypothesis H1 was supported, confirming that TL positively influences PS. This result aligns with previous studies emphasizing the role of TL in enhancing project outcomes (Kissi *et al*., 2013; Aga *et al*., 2016; Zaman *et al*., 2019; Nauman *et al*., 2022). Transformational leaders promote shared vision, trust, and goal alignment, which improve collaboration and collective commitment, thereby strengthening performance under uncertainty (Raziq *et al*., 2018; Fareed *et al*., 2021; Ahmad *et al*., 2022). TL also fosters adaptability and innovation, enabling teams to respond effectively to environmental complexity (Naeem & Khanzada, 2017; Ali *et al*., 2021b). These findings underscore the importance of developing transformational leadership competencies among project managers to sustain performance in dynamic contexts (Ahmad *et al*., 2023; Raziq *et al*., 2025).

Hypothesis H2 was also validated, demonstrating that TB mediates the relationship between TL and PS. Transformational leaders cultivate environments that support goal formulation, role clarification, and open communication, thereby translating leadership behaviors into effective project execution (Aga *et al*., 2016; Nauman *et al*., 2022). Consistent with prior research, TB enhances collaboration and coordination in complex project environments (Ali *et al*., 2021b; Zavari & Afshar, 2023).

Hypothesis H3 confirmed that TMS strengthens the relationship between TL and PS. By providing strategic guidance, resources, and organizational alignment, TMS enables leaders to implement effective strategies and overcome structural barriers (Kanwal *et al*., 2017; Ali *et al*., 2020). These findings support prior evidence that senior management involvement enhances project outcomes, stakeholder satisfaction, and strategic coherence (Spreitzer, 1995; Brière *et al*., 2015; Yu *et al*., 2018). TMS therefore amplifies the positive effects of TL by fostering high-performance cultures characterized by motivation and resource availability (Fareed *et al*., 2023).

Similarly, Hypothesis H4 was supported, indicating that TMS positively moderates the TL–TB relationship. Strong organizational support facilitates the implementation of TB practices, including team alignment, role clarification, and conflict resolution, thereby reinforcing team cohesion and collective responsibility (Bass & Riggio, 2006; Klein *et al*., 2009; Wang & Howell, 2010).

In contrast, Hypothesis H5 was not supported, as TMS did not significantly moderate the TB–PS relationship. One explanation is that in organizations with well-established TB routines, team processes may independently sustain performance, reducing reliance on top management involvement (Kerzner, 2017). Misalignment between strategic priorities and operational practices or variability in TB implementation may also weaken the moderating influence of TMS (Kanwal *et al*., 2017; Zwikael & Meredith, 2019). These findings suggest that organizations should focus on integrating TB practices with broader strategic objectives rather than relying solely on senior management intervention.

Finally, Hypothesis H6 was partially supported, indicating that TMS plays a compensatory role in low-support contexts. When organizational support is limited, TMS enhances the indirect effect of TL on PS through TB by providing critical resources and alignment (Klein *et al*., 2009; Aga *et al*., 2016). However, in average and high-support environments, alternative organizational mechanisms and established TB norms reduce dependence on senior management involvement (Kerzner, 2017; Santos-Vijande *et al*., 2018). This pattern aligns with findings from Seibert *et al*. (2004) and Müller *et al*. (2018), suggesting that mature organizational systems can substitute for direct top management intervention.

Conclusion

Theoretical Implications

This study makes several key contributions to the leadership and project management literature. First, it enriches the understanding of TL in driving PS by demonstrating that TL plays a significant role in fostering team cohesion, motivation, and collaboration. Transformational leaders inspire teams to align themselves with project goals, thereby

significantly enhancing overall project outcomes (Ali *et al*., 2021b; Nauman *et al*., 2022; Fareed *et al*., 2023). Second, this study advances the discussion on TB as a mediating factor between TL and PS. This suggests that TB interventions foster a conducive environment for creativity and innovation, leading to higher performance (Ali *et al*., 2021a; Nauman *et al*., 2022). This introduces new avenues for exploring how leadership behavior influences team dynamics in complex project environments. Third, this study extends the COR theory by framing TMS as a moderating factor that influences the effectiveness of leadership and TB efforts. By conceptualizing TMS as a "resource convoy," this research underscores the critical importance of resource availability, strategic alignment, and senior management support in maximizing TL's impact on PS (Kanwal *et al*., 2017; Hobfoll *et al*., 2018; Fareed *et al*., 2023).

Practical Implications

The findings of this study have significant practical implications for project managers and organizations aiming to enhance PS. Integrating TL with effective TB strategies and robust TMS creates a conducive environment for achieving the project goals. Transformational leaders inspire motivation, foster collaboration, enhance communication, and drive team cohesion and innovation, which are critical factors for success in dynamic industries, such as IT, construction, and research (Müller & Turner, 2010; Shafi *et al*., 2020; Ali *et al*., 2021b; Nauman *et al*., 2022). The support of top management through resource provision, strategic guidance, and cultivation of an empowering culture amplifies the effectiveness of TL, enabling leaders to maximize their positive influence on project outcomes (Hobfoll *et al*., 2018; Yu *et al*., 2018; Fareed *et al*., 2023). In low-support environments, robust TMS bridges gaps in resources and alignment, enhances team cohesion, and drives PS (McDonough, 2000; Pollack & Matous, 2019). However, in contexts with strong TB norms, where the TB-PS link is already robust, the moderating role of TMS may diminish. Instead, organizations should focus on refining TB interventions and aligning them with project objectives to sustain performance (Kanwal *et al*., 2017; Santos-Vijande *et al*., 2018). Conversely, in high-support environments, developing TL skills is critical for sustaining innovation and collaboration, ensuring that teams remain adaptive and align themselves with their strategic goals (Sohmen, 2013; Kanwal *et al*., 2017). Together, TL and TMS ensured that the project teams achieved superior outcomes under varying conditions.

Limitations and Future Research

This study had several limitations. First, the cross-sectional design restricts causal inferences. Future research should adopt longitudinal designs to capture the evolving dynamics of TL, TB, TMS, and PS over time (Podsakoff *et al*., 2003). Second, reliance on self-reported data from project managers may introduce a common method bias, which can be addressed in future research by collecting data from multiple sources, such as team members or supervisors, to enhance the reliability and objectivity of the findings (Podsakoff & Organ, 1986). Third, the generalizability of the findings is limited by the focus on project-based organizations in Tunisia, suggesting the need for future studies across diverse industries and cultures to validate these results. Although this study highlights the significance of TMS, it did not differentiate between varying degrees or types of TMS. Future research could examine how specific aspects of TMS, such as strategic alignment, resource provision, or cultural support, influence the effectiveness of leadership and TB efforts in achieving PS.

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