

**Mediating Effect of Affective Commitment among Leader Member Exchange
Communication in Virtual Project Success**

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ABSTRACT

The increasing reliance on virtual project teams has transformed organizational practices, making effective leadership and employee commitment essential determinants of project success. This study examined the mediating effect of affective commitment on the relationship between Leader–Member Exchange (LMX) and Virtual Project Success among employees working in virtual project environments. Grounded in Leader–Member Exchange Theory and Social Exchange Theory, the study proposed that high-quality leader–member relationships enhance employees' affective commitment, which subsequently contributes to improved project outcomes. A quantitative, cross-sectional research design was employed, and data were collected from employees working in virtual project teams across public and private organizations in Punjab, Pakistan. Using a convenience sampling technique, 250 questionnaires were distributed, of which N=226 valid responses were retained for analysis. Data were analyzed using IBM SPSS Statistics 26 and AMOS 24 through descriptive statistics, reliability analysis, Pearson correlation, Confirmatory Factor Analysis (CFA), Structural Equation Modeling (SEM), and bootstrapping procedures to test the proposed mediation model. The findings revealed that Leader–Member Exchange had a significant positive effect on both Affective Commitment and Virtual Project Success. Affective Commitment also significantly predicted Virtual Project Success. Furthermore, bootstrapping analysis confirmed that Affective Commitment partially mediated the relationship between Leader–Member Exchange and Virtual Project Success. These findings suggest that supportive leader–employee relationships foster employees' emotional attachment to their organizations, thereby enhancing collaboration, engagement, and project performance in virtual work settings. The study contributes to leadership and project management literature by providing empirical evidence from a developing-country context and offers practical implications for organizational leaders and project managers seeking to improve virtual project effectiveness through relationship-oriented leadership and employee commitment strategies.

Keywords: Leader–Member Exchange (LMX), Affective Commitment, Virtual Project Success, Virtual Teams, Organizational Commitment, Structural Equation Modeling (SEM), Project Management

INTRODUCTION

Background of Study

The rapid advancement of digital technologies, cloud computing, and communication platforms has fundamentally transformed the way organizations execute projects, resulting in the widespread adoption of virtual project teams across industries. Virtual projects enable geographically dispersed professionals to collaborate through information and communication technologies, allowing organizations to access diverse expertise while reducing operational costs and increasing organizational flexibility (Gilson et al.,

2021). The global shift toward remote and hybrid work arrangements, accelerated by technological innovation and recent organizational transformations, has further emphasized the strategic importance of virtual project management in achieving sustainable organizational performance (Contreras et al., 2020). Despite the numerous advantages of virtual projects, managing geographically dispersed teams presents considerable challenges, including communication barriers, limited face-to-face interaction, reduced interpersonal trust, cultural diversity, coordination complexity, and difficulties in maintaining employee motivation and engagement (Newman et al., 2020). These challenges directly influence project outcomes, making leadership one of the most critical determinants of virtual project success. Effective leaders facilitate collaboration, establish trust, resolve conflicts, promote knowledge sharing, and foster an environment where employees remain committed to achieving organizational objectives despite physical separation (Purvanova & Kenda, 2021). Consequently, scholars have increasingly argued that successful virtual projects depend not only on technological infrastructure but also on the quality of interpersonal relationships established between leaders and team members (Hoch & Kozlowski, 2019). As organizations continue to expand virtual work environments across public and private sectors, understanding the psychological and relational mechanisms through which leadership contributes to project success has become a significant research priority. This growing interest has positioned leadership quality and employee commitment at the center of contemporary project management research, particularly within virtual work settings where social interactions occur primarily through digital communication platforms (Alsharo et al., 2022; Gilson et al., 2021).

Leader–Member Exchange (LMX) in Virtual Project Management

Leader–Member Exchange (LMX) theory has become one of the most influential leadership frameworks for explaining how high-quality relationships between leaders and employees contribute to positive organizational outcomes. Unlike traditional leadership theories that assume leaders treat all employees similarly, LMX theory proposes that leaders develop unique exchange relationships with individual team members, characterized by varying levels of trust, mutual respect, loyalty, and professional support (Rockstuhl & Anand, 2020). High-quality LMX relationships encourage open communication, knowledge sharing, employee empowerment, and collaborative problem-solving, which are particularly essential in virtual project environments where physical interactions are limited (Martin et al., 2018). In geographically dispersed teams, employees often rely on frequent communication and supportive leader behaviors to overcome coordination challenges and maintain confidence in achieving project objectives (Newman et al., 2020). Empirical evidence consistently demonstrates that employees who experience stronger leader–member relationships report higher job satisfaction, organizational citizenship behavior, work engagement, innovative performance, and project effectiveness (Breevaart et al., 2021; Buch, Martinsen, & Kuvaas, 2019). Within virtual projects, leaders who establish high-quality exchange relationships promote collaboration, reduce uncertainty, facilitate information exchange, and strengthen interpersonal trust despite geographical separation. Consequently, LMX has been recognized as a critical predictor of project performance because it creates an environment in which employees feel valued, supported, and motivated to achieve shared organizational goals (Purvanova & Kenda, 2021). Nevertheless, researchers increasingly argue that the influence of LMX on project success may not be entirely direct, suggesting that psychological mechanisms such as employees' affective commitment may explain how strong leader–employee relationships translate into successful virtual project outcomes (Kim & Beehr, 2020).

Virtual Project Success and Its Organizational Significance

Virtual project success has become a strategic priority for organizations as remote and geographically dispersed teams increasingly undertake complex projects across industries. Traditionally, project success was evaluated using the "iron triangle" of cost, time, and quality; however, contemporary research

recognizes that successful virtual projects also depend on stakeholder satisfaction, effective collaboration, knowledge sharing, innovation, and long-term organizational value (Pollack et al., 2018). The absence of regular face-to-face interaction in virtual teams increases reliance on leadership effectiveness, employee commitment, trust, and communication quality to ensure project objectives are achieved (Alsharo et al., 2022). Project managers must therefore create an environment that encourages collaboration, timely decision-making, and continuous information exchange while overcoming challenges related to geographical distance, cultural diversity, and technological dependence (Newman et al., 2020). Studies have shown that organizations with supportive leadership and committed employees demonstrate higher levels of team cohesion, productivity, and project performance in virtual settings (Contreras et al., 2020). Moreover, employees who perceive strong support from their leaders are more likely to remain engaged, proactively solve problems, and contribute to project goals beyond their formal job responsibilities (Breevaart et al., 2021). Although previous research has identified leadership and organizational commitment as important determinants of project outcomes, empirical evidence explaining the underlying mechanisms linking these variables to virtual project success remains limited, particularly in developing economies where digital project management practices continue to evolve. Addressing this gap can provide valuable theoretical insights and practical guidance for organizations seeking to improve project effectiveness through relationship-based leadership and employee commitment strategies.

Research Gap

Although extensive research has established the importance of Leader–Member Exchange (LMX) and affective commitment in enhancing employee attitudes and organizational performance, several theoretical and empirical gaps remain within the context of virtual project management. Most existing studies have examined the direct relationships between leadership and employee outcomes in conventional organizational settings, while comparatively fewer investigations have explored the psychological processes through which LMX contributes to virtual project success (Martin et al., 2018; Newman et al., 2020). Moreover, evidence regarding the mediating role of affective commitment in virtual work environments remains limited and inconsistent, particularly in developing countries where organizations are rapidly adopting digital collaboration technologies but continue to face challenges related to communication, trust, and employee engagement (Contreras et al., 2020). Previous studies have predominantly focused on individual work performance, job satisfaction, or organizational commitment rather than project success as a multidimensional organizational outcome (Breevaart et al., 2021). Furthermore, limited empirical evidence is available from Pakistan, despite the increasing reliance on virtual teams in information technology, telecommunications, education, and service-based organizations. This lack of context-specific research restricts the generalizability of existing findings and highlights the need for further investigation. Therefore, the present study addresses these gaps by examining the mediating effect of affective commitment on the relationship between Leader–Member Exchange and virtual project success. By integrating leadership and organizational commitment perspectives within a single conceptual framework, this study aims to extend the existing literature and provide evidence-based recommendations for managers seeking to improve project outcomes in virtual work environments.

Theoretical Foundation

The present study is grounded in Leader–Member Exchange (LMX) Theory, which posits that leaders develop varying quality relationships with individual employees, ultimately influencing their attitudes and work-related behaviors. High-quality LMX relationships are characterized by mutual trust, respect, support, and reciprocal obligation, creating an environment in which employees are more likely to develop stronger emotional attachment and commitment toward their organization (Graen & Uhl-Bien, 1995; Rockstuhl & Anand, 2020). Within virtual project settings, where interactions are primarily technology-mediated and opportunities for face-to-face communication are limited, the quality of leader–

employee relationships becomes increasingly important for sustaining employee engagement and achieving project objectives (Purvanova & Kenda, 2021). Based on this theoretical perspective, affective commitment is proposed as a key psychological mechanism that explains how supportive leadership translates into successful project outcomes. Employees who perceive fairness, recognition, and continuous support from their leaders are more likely to identify with organizational goals, demonstrate higher levels of collaboration, and contribute beyond formal job requirements (Meyer et al., 2019; Breevaart et al., 2021). Consequently, examining affective commitment as a mediator provides a more comprehensive understanding of the relationship between LMX and virtual project success than investigating direct effects alone. By integrating leadership and organizational commitment theories within the context of virtual project management, this study enriches the existing literature and offers a theoretically grounded framework for understanding employee behavior in digitally connected workplaces. The findings are expected to assist organizations in developing evidence-based leadership strategies that strengthen employee commitment and improve the effectiveness of virtual project teams in an increasingly dynamic and technology-driven business environment.

Research Questions

- Q1. What is the relationship between Leader–Member Exchange (LMX) and Virtual Project Success?
- Q2. What is the relationship between Leader–Member Exchange (LMX) and Affective Commitment?
- Q3. What is the relationship between Affective Commitment and Virtual Project Success?
- Q4. Does Affective Commitment mediate the relationship between Leader–Member Exchange (LMX) and Virtual Project Success?
- Q5. To what extent does Leader–Member Exchange predict Virtual Project Success?
- Q6. To what extent does Leader–Member Exchange predict employees' Affective Commitment?
- Q7. Does the inclusion of Affective Commitment significantly improve the explanatory power of the relationship between Leader–Member Exchange and Virtual Project Success?

Research Objectives

- 1. To examine the relationship between Leader–Member Exchange and Virtual Project Success.
- 2. To examine the relationship between Leader–Member Exchange and Affective Commitment.
- 3. To examine the relationship between Affective Commitment and Virtual Project Success.
- 4. To determine the effect of Leader–Member Exchange on Virtual Project Success.
- 5. To determine the effect of Leader–Member Exchange on Affective Commitment.
- 6. To determine the effect of Affective Commitment on Virtual Project Success.
- 7. To examine the mediating effect of Affective Commitment on the relationship between Leader–Member Exchange and Virtual Project Success.

Research Hypotheses

- H1. Leader–Member Exchange has a significant positive relationship with Virtual Project Success.
- H2. Leader–Member Exchange has a significant positive relationship with Affective Commitment.
- H3. Affective Commitment has a significant positive relationship with Virtual Project Success.
- H4. Leader–Member Exchange has a significant positive effect on Virtual Project Success.
- H5. Leader–Member Exchange has a significant positive effect on Affective Commitment.
- H6. Affective Commitment has a significant positive effect on Virtual Project Success.
- H7. Affective Commitment significantly mediates the relationship between Leader–Member Exchange and Virtual Project Success.

Underpinning Theory

Leader–Member Exchange (LMX) Theory

The present study is primarily underpinned by Leader–Member Exchange (LMX) Theory, originally developed by Graen and Uhl-Bien (1995). LMX theory posits that leaders establish unique and differentiated relationships with each subordinate rather than treating all employees identically. These relationships vary in quality and are characterized by mutual trust, respect, loyalty, and reciprocal support. High-quality leader–member exchanges promote positive employee attitudes, stronger organizational commitment, enhanced job performance, and greater willingness to contribute beyond formal role expectations (Graen & Uhl-Bien, 1995; Martin et al., 2018). In virtual project environments, where communication occurs primarily through digital platforms and face-to-face interactions are limited, the quality of leader–employee relationships becomes particularly important for maintaining collaboration, trust, and project effectiveness (Purvanova & Kenda, 2021).

The theoretical assumptions of LMX suggest that employees who experience supportive and high-quality relationships with their leaders are more likely to develop stronger affective commitment toward their organization. This emotional attachment encourages greater cooperation, knowledge sharing, and engagement, which ultimately contributes to successful project outcomes (Meyer et al., 2019). Consequently, affective commitment serves as an important psychological mechanism explaining how leader–member relationships translate into virtual project success. By applying LMX Theory, the present study proposes that the influence of leader–member exchange on virtual project success operates both directly and indirectly through employees' affective commitment. Furthermore, Social Exchange Theory (SET) (Blau, 1964) provides the broader theoretical foundation for LMX. SET argues that relationships are based on reciprocal exchanges, whereby employees respond to supportive leadership with positive attitudes and behaviors. Within virtual project settings, employees who perceive trust, fairness, and support from their leaders reciprocate by demonstrating stronger affective commitment and greater dedication to achieving project objectives (Cropanzano et al., 2017). Therefore, integrating LMX Theory with Social Exchange Theory provides a robust theoretical explanation for the proposed mediation model and strengthens the conceptual foundation of the present study.

RESEARCH METHODOLOGY

Research Design

The present study employed a quantitative, cross-sectional, explanatory research design to examine the mediating effect of affective commitment on the relationship between Leader–Member Exchange (LMX) and Virtual Project Success. A quantitative approach was considered appropriate because it facilitates the objective measurement of relationships among study variables and enables hypothesis testing using statistical techniques. The cross-sectional design allowed data to be collected from respondents at a single point in time, making it suitable for investigating the proposed mediation model in virtual project environments. Furthermore, the explanatory design was adopted to determine both the direct and indirect relationships among the variables and to provide empirical evidence supporting the conceptual framework.

Research Setting

The study was conducted among employees working on virtual projects in public and private organizations across Punjab, Pakistan. Organizations operating in sectors such as information technology, software development, telecommunications, education, engineering, financial services, and consulting increasingly rely on virtual teams to execute projects through digital communication technologies. These organizations provided an appropriate setting for examining leadership relationships, employee commitment, and project success within virtual work environments.

Population of the Study

The target population comprised employees working in virtual project teams within public and private organizations in Punjab, Pakistan. Eligible participants included project managers, team leaders, software engineers, project coordinators, business analysts, consultants, and other professionals who regularly collaborated through virtual communication platforms such as Microsoft Teams, Zoom, Google Meet, Slack, and similar technologies. Respondents were required to have at least six months of experience working in virtual projects to ensure familiarity with virtual team dynamics and leadership practices.

Sampling Technique

A convenience sampling technique was employed because a comprehensive sampling frame of virtual project employees was not readily available. Participants who met the inclusion criteria and were willing to participate voluntarily were recruited through organizational contacts and professional networks. Convenience sampling has been widely applied in organizational behavior and virtual team research where access to specialized employee populations is limited.

Sample Size

Data were collected from 250 employees working in virtual project teams. After screening the questionnaires for completeness, missing values, and response consistency, 226 valid responses were retained for the final statistical analysis, resulting in a response rate of 90.4%. The final sample was considered adequate for mediation analysis and Structural Equation Modeling (SEM), exceeding the minimum recommendations for testing models involving latent constructs.

Inclusion and Exclusion Criteria

Inclusion Criteria

- Employees currently working in virtual project teams.
- Minimum six months of experience in virtual projects.
- Full-time employees in public or private organizations.
- Individuals aged 18 years or above.
- Respondents willing to participate voluntarily.

Exclusion Criteria

- Employees with less than six months of virtual project experience.
- Interns and temporary staff.
- Employees not directly involved in project-based work.
- Incomplete or duplicate questionnaires.

Research Instruments

Three standardized instruments were used to measure the study variables.

Leader–Member Exchange (LMX)

Leader–Member Exchange was measured using the LMX-7 Scale developed by Graen and Uhl-Bien (1995). The instrument consists of seven items assessing the quality of leader–employee relationships in terms of trust, respect, loyalty, and mutual support. Responses were recorded on a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Higher scores indicate better-quality leader–member relationships.

Affective Commitment

Affective Commitment was measured using the Affective Commitment Scale developed by Meyer and Allen (1997). The scale contains eight items assessing employees' emotional attachment, identification, and involvement with their organization. Responses were measured using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Higher scores represent stronger affective commitment.

Virtual Project Success

Virtual Project Success was measured using the Project Success Scale adapted from Aga, Noorderhaven, and Vallejo (2016). The scale evaluates project performance in terms of project quality, schedule adherence, stakeholder satisfaction, team collaboration, and overall project achievement. Responses were obtained on a five-point Likert scale from 1 (Strongly Disagree) to 5 (Strongly Agree).

Data Collection Procedure

Permission to conduct the study was obtained from the relevant organizations before data collection. Participants were informed about the purpose of the study, the voluntary nature of participation, confidentiality of responses, and their right to withdraw at any stage without penalty. The questionnaire was administered electronically using Google Forms, allowing respondents to complete the survey remotely through secure online access. Data collection was conducted over approximately eight weeks.

Ethical Considerations

The study adhered to internationally accepted ethical standards for research involving human participants. Participation was voluntary, informed consent was obtained before data collection, anonymity was maintained, and no personally identifiable information was collected. All responses were treated confidentially and used solely for academic purposes. Participants were informed that they could discontinue participation at any stage without any adverse consequences.

Data Analysis

Data analysis was performed using IBM SPSS Statistics (Version 26) and AMOS (Version 24).

RESULTS

Table 1

Demographic Characteristics of Respondents (N = 226)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	141	62.4
	Female	85	37.6
Age	20–30 years	74	32.7
	31–40 years	108	47.8
	Above 40 years	44	19.5
Education	Bachelor's	69	30.5
	Master's	123	54.4
	MPhil/PhD	34	15.1
Work Experience	Less than 5 years	68	30.1
	5–10 years	97	42.9
	More than 10 years	61	27.0

Table 1 presents the demographic profile of the 226 respondents who participated in the study. Among the participants, 141 (62.4%) were male, while 85 (37.6%) were female, indicating that both genders were represented in the sample. Regarding age, the largest proportion of respondents (47.8%) belonged to the 31–40 years age group, followed by 32.7% aged 20–30 years, whereas 19.5% were above 40 years. The educational profile showed that more than half of the respondents (54.4%) possessed a Master's degree, followed by 30.5% holding a Bachelor's degree and 15.1% having MPhil or PhD qualifications. With respect to professional experience, 42.9% reported 5–10 years of work experience, 30.1% had less than five years, and 27.0% possessed more than ten years of experience. These findings indicate that the sample consisted of experienced and well-qualified professionals involved in virtual project environments, thereby providing an appropriate basis for examining the relationships among Leader–Member Exchange, Affective Commitment, and Virtual Project Success.

Table 2

Descriptive Statistics and Reliability Analysis

Variable	Items	Mean	SD	Cronbach's α
Leader–Member Exchange	7	3.88	0.61	.91
Affective Commitment	8	3.74	0.65	.89
Virtual Project Success	12	3.95	0.58	.93

Table 2 presents the descriptive statistics and reliability coefficients for the study variables. The findings indicate that Virtual Project Success recorded the highest mean score ($M = 3.95$, $SD = 0.58$), followed by Leader–Member Exchange ($M = 3.88$, $SD = 0.61$) and Affective Commitment ($M = 3.74$, $SD = 0.65$). The relatively moderate standard deviations suggest that respondents demonstrated a reasonable level of agreement regarding each construct, indicating consistency in their responses. Furthermore, the reliability analysis revealed excellent internal consistency for all measurement scales. The Cronbach's alpha values ranged from .89 to .93, substantially exceeding the recommended minimum threshold of .70. Specifically, Leader–Member Exchange achieved an alpha of .91, Affective Commitment .89, and Virtual Project Success .93. These findings confirm that the instruments used in this study possess satisfactory reliability and are appropriate for measuring the intended constructs. Consequently, the variables were considered suitable for further inferential analyses, including correlation analysis, confirmatory factor analysis, structural equation modeling, and mediation analysis.

Table 3

Pearson Correlation Matrix

Variables	1	2	3
1. Leader–Member Exchange	—		
2. Affective Commitment	.62**	—	

3. Virtual Project Success	.55**	.69**	—
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Note. $p < .01$.

Table 3 presents the Pearson product–moment correlation coefficients among the study variables. The findings demonstrate statistically significant positive relationships among all constructs. Leader–Member Exchange exhibited a strong positive correlation with Affective Commitment ($r = .62, p < .01$), suggesting that employees who reported better relationships with their leaders also demonstrated stronger emotional attachment to their organizations. Likewise, Leader–Member Exchange showed a moderate positive correlation with Virtual Project Success ($r = .55, p < .01$), indicating that supportive leader–employee relationships are associated with more successful virtual project outcomes. Moreover, Affective Commitment demonstrated the strongest positive relationship with Virtual Project Success ($r = .69, p < .01$), implying that emotionally committed employees contribute more effectively to project performance. The absence of excessively high correlations (greater than .80) indicates that multicollinearity is unlikely to be a concern. Overall, these results provide preliminary empirical support for the proposed theoretical framework and justify proceeding with structural equation modeling to test the hypothesized direct and indirect relationships among the study variables.

Table 4

Confirmatory Factor Analysis (Measurement Model)

Fit Index	Recommended Value	Obtained Value
χ^2/df	< 3.00	2.11
CFI	> .90	.95
TLI	> .90	.94
GFI	> .90	.92
RMSEA	< .08	.061
SRMR	< .08	.046

Table 4 presents the goodness-of-fit indices obtained from the Confirmatory Factor Analysis (CFA) conducted to evaluate the measurement model. The overall model demonstrated a satisfactory fit to the observed data. The obtained χ^2/df value of 2.11 was below the recommended threshold of 3.00, indicating an acceptable level of model fit. Similarly, the Comparative Fit Index (CFI = .95), Tucker–Lewis Index (TLI = .94), and Goodness-of-Fit Index (GFI = .92) all exceeded the recommended criterion of .90, demonstrating excellent comparative model fit. Furthermore, the Root Mean Square Error of Approximation (RMSEA = .061) and Standardized Root Mean Square Residual (SRMR = .046) were both below the recommended cut-off value of .08, indicating minimal residual error between the observed and estimated covariance matrices. Collectively, these findings confirm that the measurement model

adequately represents the relationships among the latent constructs and supports the construct validity of the instruments used in the study.

Table 5

Composite Reliability and Convergent Validity

Construct	Composite Reliability (CR)	Average Variance Extracted (AVE)
Leader–Member Exchange (LMX)	.92	.64
Affective Commitment (AC)	.90	.61
Virtual Project Success (VPS)	.93	.67

Table 5 presents the results of Composite Reliability (CR) and Average Variance Extracted (AVE) for assessing the reliability and convergent validity of the measurement model. Composite Reliability values ranged from .90 to .93, exceeding the recommended threshold of .70, thereby confirming excellent internal consistency among the observed indicators measuring each latent construct. Specifically, Leader–Member Exchange achieved a Composite Reliability value of .92, Affective Commitment .90, and Virtual Project Success .93, indicating that the measurement items consistently represented their respective constructs. Similarly, the AVE values ranged from .61 to .67, all surpassing the recommended criterion of .50, demonstrating satisfactory convergent validity. These findings indicate that the indicators explained more than 50% of the variance in their respective latent variables, confirming that the measurement items adequately captured the intended theoretical constructs. The combination of high Composite Reliability and acceptable AVE values suggests that the study instruments possess strong psychometric properties and are appropriate for measuring Leader–Member Exchange, Affective Commitment, and Virtual Project Success. Consequently, the measurement model satisfies the recommended standards of reliability and convergent validity, allowing the structural relationships among the variables to be examined with confidence.

Table 6

Discriminant Validity (Fornell–Larcker Criterion)

Construct	LMX	AC	VPS
Leader–Member Exchange	.80		
Affective Commitment	.62	.78	
Virtual Project Success	.55	.69	.82

Note. Diagonal values (bold) represent the square root of the Average Variance Extracted (AVE).

Table 6 presents the discriminant validity assessment using the Fornell–Larcker criterion. According to this criterion, the square root of the Average Variance Extracted (AVE) for each construct should be greater than its correlations with all other constructs. The results indicate that the square root of the AVE for Leader–Member Exchange (.80), Affective Commitment (.78), and Virtual Project Success (.82) exceeded the corresponding inter-construct correlations. Specifically, the correlation between Leader–Member Exchange and Affective Commitment was .62, while the correlation between Leader–Member Exchange and Virtual Project Success was .55, both of which were lower than the square root of the AVE for Leader–Member Exchange. Likewise, the correlation between Affective Commitment and Virtual Project Success (.69) remained lower than the square roots of the AVE for both constructs. These findings confirm that each construct is empirically distinct and measures a unique concept within the proposed model. Therefore, the measurement model demonstrates satisfactory discriminant validity, indicating that no substantial overlap exists among the study variables. Establishing discriminant validity further strengthens the credibility of the measurement model and supports the subsequent structural analyses conducted to test the proposed hypotheses.

Table 7

Mediation Analysis Using Bootstrapping

Effect	β	Boot SE	95% LLCI	95% ULCI	p
Direct Effect	.31	.07	.18	.45	<.001
Indirect Effect	.30	.05	.21	.41	<.001
Total Effect	.61	.06	.49	.72	<.001

Table 7 presents the results of the mediation analysis conducted using the bootstrapping procedure with 5,000 bootstrap samples. The analysis revealed that the direct effect of Leader–Member Exchange on Virtual Project Success remained statistically significant ($\beta = .31$, $p < .001$), indicating that supportive leader–employee relationships directly contribute to successful virtual project outcomes. More importantly, the indirect effect through Affective Commitment was also statistically significant ($\beta = .30$, $p < .001$), with the 95% confidence interval (.21 to .41) excluding zero. This confirms that Affective Commitment serves as a significant mediator in the relationship between Leader–Member Exchange and Virtual Project Success. Furthermore, the total effect ($\beta = .61$, $p < .001$) demonstrates that the combined direct and indirect influence of Leader–Member Exchange substantially enhances project success. Since both the direct and indirect effects remained statistically significant after introducing the mediator, the findings indicate partial mediation rather than full mediation. These results suggest that Leader–Member Exchange influences Virtual Project Success both directly and indirectly by strengthening employees' emotional attachment to their organizations. Therefore, Hypothesis 4 was supported, highlighting the pivotal role of Affective Commitment as an important psychological mechanism linking effective leadership with successful virtual project outcomes.

DISCUSSION

Overview of the Findings

The present study examined the mediating effect of affective commitment on the relationship between Leader–Member Exchange (LMX) and Virtual Project Success among employees working in virtual project teams. The findings revealed that Leader–Member Exchange was positively and significantly associated with both affective commitment and virtual project success. Furthermore, affective commitment demonstrated a significant positive relationship with virtual project success and partially mediated the relationship between Leader–Member Exchange and project success. These findings suggest that employees who experience supportive, trust-based, and high-quality relationships with their leaders are more likely to develop stronger emotional attachment toward their organizations, which subsequently enhances their commitment, collaboration, and contribution to successful project outcomes. The structural model confirmed all proposed hypotheses, providing empirical support for the conceptual framework developed in this study.

These findings are consistent with Leader–Member Exchange Theory and Social Exchange Theory, both of which emphasize that reciprocal and supportive leader–employee relationships foster positive employee attitudes and behaviors that ultimately improve organizational performance (Graen & Uhl-Bien, 1995; Cropanzano et al., 2017). Within virtual work environments, where interpersonal interactions are mediated through digital communication technologies, the quality of leadership relationships becomes increasingly important for maintaining employee motivation, trust, and engagement (Purvanova & Kenda, 2021). Overall, the findings contribute to the growing body of literature on virtual leadership by demonstrating that affective commitment serves as an important psychological mechanism linking leadership quality to project success. Consequently, organizations seeking to improve virtual project performance should prioritize the development of high-quality leader–employee relationships while fostering employees' emotional attachment and commitment to organizational goals.

Leader–Member Exchange and Virtual Project Success

The findings of the present study indicate that Leader–Member Exchange has a significant positive effect on virtual project success, supporting the first hypothesis. Employees who perceived higher-quality relationships with their leaders reported greater levels of project effectiveness, collaboration, and successful project completion. This finding suggests that effective leadership extends beyond assigning tasks and monitoring performance; rather, leaders who establish trust, mutual respect, and open communication with employees create an environment that enhances team coordination and facilitates the achievement of project objectives. Within virtual project environments, where geographical separation and technology-mediated communication may create barriers to collaboration, high-quality leader–member relationships become essential for maintaining employee confidence, reducing uncertainty, and improving project execution (Purvanova & Kenda, 2021).

These findings are consistent with previous empirical studies reporting that Leader–Member Exchange enhances employee performance, knowledge sharing, work engagement, innovation, and overall organizational effectiveness (Martin et al., 2018; Breevaart et al., 2021). Similarly, Newman et al. (2020) argued that supportive leadership is particularly important in virtual teams because leaders must compensate for the lack of face-to-face interaction by fostering trust and maintaining effective communication. The present findings therefore reinforce the proposition that leadership quality remains one of the strongest determinants of project success regardless of whether employees work in traditional or virtual settings. The study also extends previous research by providing empirical evidence from Pakistan, where virtual project management continues to expand across diverse organizational sectors.

These findings suggest that organizations should invest in leadership development initiatives that strengthen interpersonal relationships between leaders and employees to improve project performance and organizational competitiveness.

Leader–Member Exchange and Affective Commitment

The present study also found that Leader–Member Exchange significantly and positively predicted employees' affective commitment, thereby supporting the second hypothesis. Employees who perceived supportive, respectful, and trusting relationships with their supervisors demonstrated stronger emotional attachment to their organizations. This finding suggests that leadership plays a critical role in developing employees' psychological connection with their workplace, particularly within virtual environments where opportunities for informal interaction are relatively limited. Leaders who communicate effectively, recognize employee contributions, and provide continuous support strengthen employees' sense of belonging and organizational identification.

This finding is consistent with the work of Meyer et al. (2019), who reported that employees' emotional attachment to their organization is strengthened through supportive leadership behaviors and positive workplace relationships. Likewise, Kim and Beehr (2020) demonstrated that high-quality Leader–Member Exchange enhances employees' trust in management, job satisfaction, and organizational commitment. Within virtual project teams, these relationships become increasingly valuable because employees frequently rely on leader support to overcome communication barriers, role ambiguity, and technological challenges. Consequently, supportive leadership contributes to stronger affective commitment, which encourages employees to remain engaged and committed to achieving project objectives. These findings further validate the assumptions of Social Exchange Theory, suggesting that employees reciprocate supportive treatment received from leaders by demonstrating stronger commitment and positive work-related attitudes.

Affective Commitment and Virtual Project Success

The findings further revealed that affective commitment significantly predicted virtual project success, providing support for the third hypothesis. Employees with stronger emotional attachment to their organizations demonstrated greater willingness to collaborate with colleagues, share knowledge, solve project-related problems, and contribute beyond their formal job responsibilities. This indicates that employees' emotional commitment represents an important psychological resource that facilitates successful project implementation within virtual work environments. Because virtual teams frequently operate across different locations and depend heavily on technology-mediated communication, emotionally committed employees are more likely to remain motivated and maintain productive working relationships despite physical separation.

These findings are consistent with previous studies demonstrating that affective commitment positively influences employee performance, innovation, organizational citizenship behavior, and team effectiveness (Lee et al., 2021; Meyer et al., 2019). Employees who identify with organizational values tend to demonstrate greater persistence, accountability, and willingness to contribute toward collective goals. Therefore, organizations seeking to improve project outcomes should not focus exclusively on technological infrastructure but should also invest in leadership practices and organizational policies that enhance employees' emotional attachment to their organizations. The present findings reinforce the growing recognition that employee commitment remains a critical determinant of project success within contemporary

The present study examined the mediating effect of affective commitment on the relationship between Leader–Member Exchange (LMX) and Virtual Project Success among employees working in virtual project environments. The findings revealed that all proposed hypotheses were supported, indicating that high-quality leader–member relationships significantly contribute to successful virtual project outcomes both directly and indirectly through employees' affective commitment. Specifically, the results demonstrated that Leader–Member Exchange positively influenced Virtual Project Success and Affective Commitment, while Affective Commitment also exhibited a significant positive relationship with Virtual Project Success. Furthermore, mediation analysis confirmed that affective commitment partially mediated the relationship between Leader–Member Exchange and Virtual Project Success, suggesting that employees' emotional attachment to their organization serves as an important psychological mechanism through which supportive leadership enhances project performance.

These findings are consistent with the assumptions of Leader–Member Exchange Theory and Social Exchange Theory, which emphasize that reciprocal, trust-based relationships between leaders and employees foster positive work attitudes and behavioral outcomes (Graen & Uhl-Bien, 1995; Cropanzano et al., 2017). In virtual work environments, where communication is primarily technology-mediated and opportunities for face-to-face interaction are limited, employees rely heavily on supportive leadership to maintain engagement, trust, and commitment. Consequently, organizations that invest in strengthening leader–employee relationships are more likely to cultivate committed employees capable of achieving superior virtual project outcomes. The findings therefore provide empirical support for the proposed conceptual framework and contribute to the growing literature on leadership and virtual project management in contemporary organizations.

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