The Impact of Female Leadership Behaviour on Virtual Team Member Performance during COVID-19: The Mediating Role of Organizational Environment

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Abstract

This research intends to conduct an inquiry into the dynamics of Female leadership behavior within the Pakistani software sector with a focus on effects of the enterprise environment of virtual team member performance on its relation with project success during covid. In Pakistan's IT industry, female executives frequently display confidence and aggressiveness in their communication and decision-making approaches. Successful female leaders place a strong emphasis on teamwork and collaboration. The establishment of inclusive work cultures that prioritize varied viewpoints is crucial for promoting creativity in information technology projects. The IT sectors in Pakistan present a number of obstacles and challenges for female executives, many of which are influenced by organizational, societal, and cultural issues. This paper explore the complexities of these issues such as the impact of remote work on company resilience and layoffs, Gaps in understanding, Integration of female leadership and remote work, practical implication etc. The study uses empirical analysis to provide solid data supporting the impact Female leadership behavior on virtual team member performance. This is consistent with earlier research demonstrating the usefulness of female leadership behavior in enhancing the performance of virtual team members. However, in addition to these benefits, the study found a link between Female leadership and enterprise environment in the performance of virtual team members. Furthermore, the study, employing convenience sampling and encompassing approximately 300 participants drawn from the Rawalpindi and Islamabad regions, within a population estimated at 500,000, reveals that enterprise environment serves as a moderating factor in the correlation between virtual team member performance and female leadership behavior. This emphasizes how crucial it is to take team well-being into account in order to maximize project performance. Overall, this study offers insightful information about the intricate relationship that exists between enterprise environment, female leadership behavior, and virtual team member performance in the Pakistani software sector.

Keywords: Female leadership behavior (FLB), Virtual team member performance (VTMP), Organizational Environment (OE), Software Industry

1. Introduction

Pakistan software development sector has adopted new ways of remote collaboration. This transition has been affected by both disasters and technology advancement, changing traditional workplace norms. The primary factors include the advancement of collaborative technologies, the rise of virtualization, and the adoption of agile as well as DevOps approaches. The COVID-19 epidemic has expedited the acceptance of working remotely culture, resulting in a more worldwide talent pool and heterogeneous teams. Overall, these improvements represent a fundamental shift in how technological development teams operate, stressing flexibility, adaptability, plus remote cooperation as critical components of current work practices (Garro-Abarca, 2021).

The COVID-19 outbreak has caused a widespread use of telecommuting by businesses wanting to sustain operations and profitability. However, this change has blurred the barriers between work and private life, causing difficulties for certain workers in carrying out complex responsibilities and eventually leading to job losses. Furthermore, our findings revealed complex effects of female leadership among countries that have different wealth levels. This study contributes to our knowledge of the relationship between advancements in technology and human behavior in the COVID-19 disaster. Furthermore, it provides practical advice into using computer technology for progress while taking into account economic discrepancies across regions (Xue Ning et al., 2021).

The study aimed to examine how leadership productivity operates in virtual work environments, specifically investigating the role of inspirational leadership as a potential moderator. It also considered fatigue and job satisfaction as possible mediators. Data was collected via survey from 90 remote employees and analyzed using the PROCESS tool to test relationships through regression and moderated mediation analysis (Maclean, 2020). Results indicated a positive relationship between job satisfaction and leadership effectiveness but did not support the hypothesis that innovative leadership moderates this relationship.

This research includes women leaders from diverse cultural contexts, including both WEIRD (Western, Educated, Industrialized, Rich, Democratic) and non-WEIRD societies, emphasizing

the importance of inclusive representation beyond WEIRD samples. The central focus remains on female leaders. The study highlights increasing demands on leaders worldwide, particularly during the COVID-19 pandemic, as constituents sought decisive policies and expanded political processes. It suggests that, on average, female leaders managed the pandemic more effectively than their male counterparts, implementing measures such as earlier lockdowns and citizen-centered initiatives (Mayer & May, 2021).

The Connective Leadership Model offers a valuable framework for examining how women lead during crises. This model emphasizes interconnectedness and versatile leadership approaches suited to guiding teams from diverse backgrounds and perspectives. It outlines nine performance strategies that connective leaders may employ to manage heterogeneous teams effectively. This mixed-methods study, incorporating both quantitative and qualitative data, sought to develop a comprehensive understanding of women's leadership practices before and during the pandemic. This approach yielded important insights into the unique challenges female leaders faced during the crisis and how these experiences influenced their management strategies (Cartwright et al., 2023).

More empirical research is needed to thoroughly understand the influence of team characteristics on time allocation (Whillans et al., 2021). Future research could examine various employment sectors and how the pandemic affected them differently. For example, while the education sector may have been less impacted, supply chain industries may have faced greater challenges (AlZaabi & Author, 2021). A limitation of our methodology was the inability to follow up with participants for additional clarification, which could have enriched the findings. Employing open-ended qualitative surveys was impractical due to concerns about participant attention span. Consequently, the researcher was obligated to use a predetermined set of questions to ensure comprehensive coverage of all research areas (S. & M., 2022). Because this study focused solely on virtual teams (VTs), its findings may not be applicable to collocated or hybrid teams. Future studies should incorporate a larger and more diverse sample of virtual teams to produce more generalizable results (Kaur Bagga et al., 2023). A further drawback is that many participants were new to remote working, having only begun due to the COVID-19 lockdowns. To ensure a more comprehensive analysis, future research should include individuals with prior remote work experience. This would

aid in better understanding the evolution of opportunities within work-from-home contexts (Waizenegger et al., 2020). Following are the research questions of the current study:

- How do the effects of teleworking during the COVID-19 pandemic vary across different corporate environments?
- What role did female leadership play in mitigating the impact of virtual work on business survival and employee layoffs during the COVID-19 crisis?
- How does this mediating effect vary between high-income and low-income countries?
- How have traditional concepts of teleworking, such as its role as responsible business practice, changed in the context of the COVID-19 pandemic?

By synthesizing insights from multiple disciplines, this research provides a comprehensive understanding of the relationships between female leadership, virtual team success, and the organizational environment, thereby offering actionable strategies for leaders seeking to optimize performance and foster resilience in the face of contemporary challenges (Casciaro & Edmondson, 2019).

2. Literature Review

2.1 Impact of Female Leadership Behavior

We investigate how female executives affect gender pay gaps and business outcomes. Research indicates that female leadership tends to benefit compensation at the top of the organization but can have mixed effects on wages at the lower levels. The proportion of female employees amplifies the positive impact of female leadership on business efficiency. The results support a statistical discrimination model in which female executives are more effective at recognizing and rewarding productivity signals from female employees. This finding underscores that the underrepresentation of women in executive roles carries significant economic costs (Flabbi et al., 2019).

We argue that female-founded firms obtain less labor for equal remuneration because workers are more likely to decline offers demanding more effort from female founders. First, using matched employer-employee data from 2002 to 2012 on all founders of new ventures in Portugal, we find that full-time employees work fewer standard hours and less overtime in female-founded firms. Second, through a series of online experiments, we demonstrate that this difference in labor supply

is partially driven by divergent employee expectations of job demands at female- versus male-founded firms (Kacperczyk et al., 2023).

2.2 Virtual Team Member Performance

Since the COVID-19 outbreak, virtual teams have gained substantial traction. These teams use digital tools to collaborate and fulfill corporate goals without physical co-location. Despite their prevalence, few studies have robustly explored the relationship between virtual team leadership and team effectiveness.

The findings indicate that effective virtual team leadership significantly improves team performance. Furthermore, effective communication by virtual leaders positively impacts team effectiveness, underscoring the need for leaders to possess up-to-date knowledge of digital communication tools (Kompleks Rapid Rail Subang et al., 2023). Both effective leadership in virtual teams (Zhang et al., 2020) and AI-driven compliance in Anti-Money Laundering (Rajpoot & Raffat, 2024) highlight the importance of adaptability, trust, and organizational resilience in addressing contemporary global challenges.

We propose that three cultural value orientations—uncertainty avoidance, collectivism, and long-term orientation—influence levels of self-regulation. This self-regulation, in turn, moderates the relationship between local pandemic severity and individual performance in global virtual teams (GVTs). Based on a study of 2,727 individuals from 31 countries participating in a global consulting task during the early stages of the pandemic, we demonstrate that: (a) local pandemic severity negatively affects individual performance; (b) this negative impact is less pronounced for individuals with high self-regulation; and (c) uncertainty avoidance and a long-term orientation are positively correlated with self-regulation (Schlaegel et al., 2023).

2.3 Impact of Female Leadership Behavior on Virtual Team Member Performance

Studies suggest that female leaders are more likely to practice inclusive leadership, embracing diverse opinions and fostering environments where all team members feel heard and respected. Research by Catalyst indicated that organizations with gender-diverse leadership teams outperformed their peers in creativity and financial success, demonstrating the favorable impact of inclusive female leadership on team effectiveness (as cited in Coscieme et al., 2020).

Female leaders often exhibit more supportive leadership behaviors, including mentorship, coaching, and emotional support. Li et al. discovered that leadership support was positively associated with virtual team member performance and well-being, highlighting the importance of supportive female leadership in remote work contexts (as cited in Zhang et al., 2022).

In virtual settings, physical and temporal barriers complicate communication, as immediate information exchange is not possible when team members are in different time zones. This condition can cause substantial gaps in responses, reduce feedback speed, and limit coordination efforts (Paul et al., 2016).

While there is extensive research on collocated collaboration, less is known about the internal dynamics of virtual teams. We extend the research on team virtualization by focusing on how being virtual impacts team processes, rather than simply contrasting them with collocated teams. We identify social integration and affect management as underexplored elements in virtual team research. Specifically, we investigate how three variables - support structure, communication media diversity, and gender composition - affect the perception of social loafing, satisfaction with the group process, and virtual team cohesion. It is crucial to note that this research does not measure an objective reduction in social loafing but rather focuses on sociometric perceptions, as these perceptions significantly influence individual attitudes and collaborative function (Paul et al., 2016). Elyousfi et al. (2021) and Kashive et al. (2022) examined that e-leadership had positive impact on virtual team performance.

2.4 The Mediating Role of the Organizational Environment

Some studies used organizational environment as mediator. For e.g. Lauzen and Dozier (1992) used organizational environment as mediator and they collected the data from 262 public relations practitioners in the United States. Similarly, Luque-Vílchez et al. (2019) used organizational environment as mediator. On the basis of these facts current study used as organizational environment as mediator.

Based on the above discussion, the following hypotheses are proposed:

H1: Female leadership behavior has a positive impact on virtual performance.

H2: Female leadership behavior positively influences the organizational environment for virtual team member performance.

H3: The organizational environment mediates the relationship between female leadership behavior and virtual team performance.

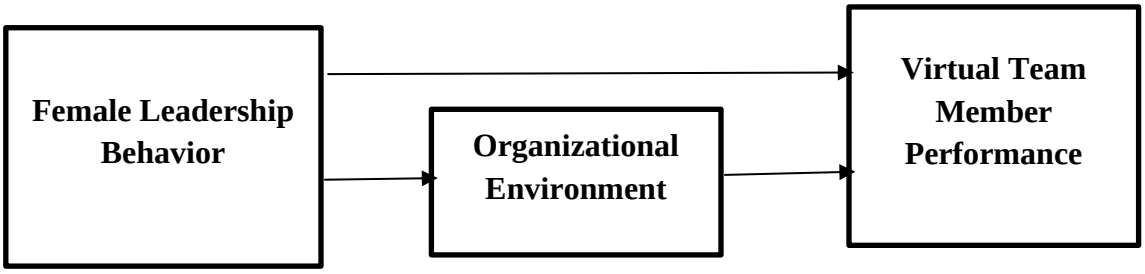

Figure 2.1: Research Model

3. Research Methodology

This research design's unit primary analysis is a person, with an emphasis on virtual team members and female organizational leaders. The people in question provide quantitative as well as qualitative information to investigate their perceptions, actions and interactions in relation to female connectedness leadership, virtual cooperation, and the organizational environment. The study's goal is to better understand how the level of the individual elements, such as executive actions and team dynamics, affect overall team effectiveness, as well as how the broader organizational setting influences these factors.

As per Pasha industry the population size of IT professionals in Pakistan is 500,000, however, this research is exclusively focused on personals directly related with software industry within Islamabad and Rawalpindi such as project managers, product owners, software engineers and developers, etc. Moreover, the study uses the convenient sampling technique because it only targets IT professionals within the predetermined demographic.

The sample size is defined as the number of observations drawn from a larger population to serve as the foundation for statistical inferences and estimations about the population's features, parameters, or attributes. Therefore, sample size for above mentioned population size of 500,000, determined using Krejcie and Morgan Table would be 302. So current research collected the data from 302 professional.

Table 1 Population sample size

Population Size	500,000

Confidence Level	95%
Margin of Error	5%
Most likely sample proportion	50%

For analyses, this study has utilized Likert scale from 1 to 5 asking the participant to rate the proposed questions or statements accordingly as the nature of this study is quantitative. The number "1" is considered as "strongly disagree" and so on till number "5" which is to be considered as "strongly agree".

IBM SPSS Statistics 27 software, uses linear regression analysis, which is utilized to analyze the gathered data from questionnaire to identify if the data is reliable and serve the purpose and correlated with the proposed hypothesis.

4. Result & Discussion

This study used a Google Sheets survey to collect data, applying SPSS v27 x64 software for evaluation. Respondents completed the survey via a link in the research request letter, which also included information on informed authorization and study objectives. A total of 302 replies were received. The descriptive analysis presents statistics that help investigators and viewers comprehend the dataset's properties and distributions, allowing for further inquiry and analysis.
Reliability analysis evaluates the accuracy of the research questionnaire used for data collecting. Reliability analysis confirms the constructs addressed in a study by analyzing internally reliability and uniformity of measuring scales, adding legitimacy and reliability to the research conclusions. Correlational analysis evaluates the connection between variables, identifying probable patterns and linkages in the collection of data. Pearson's correlation coefficient measures the strength and direction of connections among two continuous variables. This helps to understand the relationship between variables as well as how they might move along or in different directions.

In the end, regression analysis can identify predicted correlations among independent and dependent variables. This analysis uses basic linear and multiple regression to identify determinants of results in the software companies. It provides significant insights into the achievement of projects and collaboration. Various analyses provide a thorough view of data,

highlighting patterns, correlations, and predictive elements relevant to study aims and advancing expertise on the subject

4.1 Demographic Profile

The demographic information gathered from the survey gives a complete overview of the participants, which is critical in comprehending the context with the findings about female connective leadership and its impact on team performance. The sample size is 302 those surveyed, with a minor majority of females (53.97%) in comparison with males (46.02%), demonstrating an equal balance with a small superiority of female members.

Table 2: Demographic Profile

Demographics	No. of Respondents	Percentage
Gender		
Male	139	46.02
Female	163	53.97
Age		
18-25	161	53.3
26-33	85	28.14
34-41	32	10.59
42-49	12	3.97
50 & Above	11	3.64
Education		
Intermediate	23	7.61
Bachelor	120	39.73
Masters	134	44.37
M.Phil./PHD	25	8.27
Experience		
0-5 Years	220	72.84
5-10 Years	52	17.21
11-15 Years	15	4.96
16-20 Years	11	3.64

21 & Above	4	1.32

In regard to age distribution, the largest proportion of responders (53.3%) are young people aged 18–25. This implies that the insights gleaned will be substantially affected by the opinions and experiences of younger people. The next highest age group, 26-33 years, accounts for 28.14% of all responds. A smaller share of the sample is older, with 10.59% ages 34-41, 3.97% ages 42-49, and only 3.64% of those 50 years old and up. The findings show that most of the participants have higher education levels. 39.73% have a Bachelor's degree, while 44.37% have earned a Master's degree. A smaller fraction has intermediate education (7.61%), whereas 8.27% have M.Phil. or PhD degrees. This high level of education shows that the people who responded are aware and may be more open to delicate leadership techniques, such as connected leadership.

When reviewing job experience, it is clear that more than half of the participants are in the beginning stages of their careers. A significant 72.84% of those who took part have 0-5 years of professional experience, showing that they're relatively fresh to the job sector. Further 17.21% have 5-10 years of expertise, with smaller groups having 11-15 years (4.96%), 16-20 years (3.64%), and more than 21 years (1.32%). This majority of younger persons suggests that the results of the research will mostly reflect the perspectives and outcomes of early-career specialists, who may have different standards and responses to leadership styles than their older colleagues.

4.2 Descriptive Analysis

The descriptive statistics table summarizes the three primary factors examined in the research: Female Connective Leadership Behavior (FLBT), Virtual Team Member Performance (VTMPP), and Organizational environment (OE).

Each variable was evaluated using information from 302 participants. The FLBT scores varied from 20 to 44, with an average (mean) rating of 33.13 and a standard deviation of 4.70, showing moderate variability and a fairly symmetrical distribution, as indicated by a skewness coefficient of 0.035 and kurtosis value of -0.061. This shows that the majority of respondents viewed female

connective leadership conduct positively. The VTMPP scores vary between 21 to 38, with an

Table 3: Descriptive Statistics

	N	Range	Minimum	Maximum	Sum	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
FCLBT	302	24.00	20.00	44.00	10004.00	33.1258	.27066	4.70358	22.124	.035	.140	-.061	.280
VMPT	302	17.00	21.00	38.00	8903.00	29.4801	.22169	3.85251	14.842	.220	.140	-.544	.280
EET	302	22.00	8.00	30.00	6410.00	21.2252	.24047	4.17900	17.464	-.495	.140	.174	.280
Valid N (listwise)	302												

average rating of 29.48 and a standard deviation of 3.85, indicating that member's performance varies moderately between respondents. The skewness value of 0.220 shows a little positive skew, implying there are were higher scores on the bottom end, whilst the kurtosis value of -0.544 shows a little flatter distribution than expected.

The VTP ratings ranged from 8 to 30, having an average of 21.23 and a standard deviation of 4.18, demonstrating that people's opinions of the corporate environment varied. The negative skewness value of -0.495 suggests that many participants had a good perception of their corporate environment, however the kurtosis value of 0.174 indicates a little more peaked distributed than usual.

4.3 Reliability Analysis

The reliability statistics table uses Cronbach's Alpha to determine the internal coherence of the ratings used for evaluating Female Leadership Behavior, Team Member Performance (VTMPP), and Organizational environment (OE). The Female Leadership Behavior scale, which comprises 17 items, achieves a Cronbach's Alpha of 0.720 (Konczak et al., 2000), suggesting satisfactory internal consistency, implying that the items reliably measure an idea of female leadership behaviour. This scale, which comprises 12 items, gets a Cronbach's Alpha of 0.607, indicating good internal consistency and reasonable but improvable reliability, as it is somewhat lower than the usually accepted standard of 0.7.

Table 4: Reliability Statistics

Dominant Variable	N of Items	Cronbach's Alpha
Female leadership Behaviour	17	0.720
Virtual Team member performance	07	0.607
Organizational Environment	21	0.749

The OE scale, which comprises 21 items, carries a Cronbach's Alpha of 0.749 (Deci & Ryan, 2000), indicating strong internal consistency and demonstrating that the items frequently capture participants' impressions about the enterprise environment. Virtual Team Member Performance is measured with 7 items and Cronbach's Alpha of 0.749 (Liang et al., 2016).

4.4 Correlation Analysis

The correlations table describes the linkages between Female Leadership Behavior (CLBT), Team Performance (TP), and Organizational environment (OE), using Pearson's correlation coefficient to measure these interactions. To begin, FCLBT and TP have a substantial positive association (coefficient = 0.688). This shows that female leaders who exhibit more perceived connected leadership behavior do better on teams. The p-value of 0.000 suggests that this association is highly significant, which strengthens the correlation.

Second, there is an acceptable positive association between FCLBT and OE, as shown by a coefficient of 0.523. This demonstrates that when evaluations of female connective leadership behavior increase, so does their expectation of the workplace environment. Again, the p-value of 0.000 demonstrates the statistically significant value of this link.

Finally, there is an acceptable positive association between VTMP and OE (coefficient = 0.432). This link implies that a positive opinion of the company's environment is associated with improved performance among team members. The p-value of 0.000 indicates that this link is statistically significant.

Table 5: Correlations

	FLBT	VTMP	OE

FLBT	Pearson Correlation	1	.688**	.523**
	Sig. (2-tailed)		.000	.000
	Sum of Squares and Cross-products	6659.219	3750.755	3092.444
	Covariance	22.124	12.461	10.274
	N	302	302	302
TP	Pearson Correlation	.688**	1	.432**
	Sig. (2-tailed)	.000		.000
	Sum of Squares and Cross-products	3750.755	4467.381	2095.351
	Covariance	12.461	14.842	6.961
	N	302	302	302
OE	Pearson Correlation	.523**	.432**	1
	Sig. (2-tailed)	.000	.000	
	Sum of Squares and Cross-products	3092.444	2095.351	5256.689
	Covariance	10.274	6.961	17.464
	N	302	302	302

The findings indicate a complex interplay between leadership behavior, teamwork, and the working aVTMPosphere, emphasizing the importance of efficient female connective leadership. Aside from its immediate impact overall team performance, successful connective leadership among women helps to generate a more integrated and encouraging company culture. This aVTMPosphere, which is defined by straightforward interaction, shared confidence, and cooperative decision-making, fosters a culture in which teammates are encouraged and driven to operate at their finest. As a result, improved levels of teamwork are not only the outcome of leadership directions, but also of the positive corporate aVTMPosphere fostered by those managerial behaviors. Furthermore, the findings point to a mutual relationship: effective leadership improves team performance, as well as a supportive organizational climate reinforces and magnifies these beneficial benefits. This simultaneous influence emphasizes the broad reach of leadership's effect in organizational situations, when actions taken by leaders effect not just the immediate results but also the whole corporate culture and atmosphere. Understanding these patterns is critical for organizational executives and lawmakers who want to improve approaches to leadership and increase organizational performance.

4.5 Regression Analysis

A statistical method called regression analysis simulates the relationship between the dependent variable with a number of independent variables. Linear regression assumes a linear relationship,

whereas multiple regression takes into account numerous independent variables at the same time. Regression analysis takes into account a number of essential factors.

The below listed hypothesis are testing using linear regression:

H1: Female leadership behavior positively impacts virtual team member performance.

H2: Female leadership behavior impact organizational environment of virtual team member performance.

H3: Organizational environment mediates the relationship between Female leadership behavior and team member performance.

4.6 Linear Regression

The statistical summary that is presented shows the findings of a regression study that looked at the link between a dependent variable and a predictor that is probably called FCLBT. The framework's coefficient of correlation (R-squared) is 0.473, meaning that the independent variable or variables included in the model can account for around 47.3% of the variance in the dependent variable. This points to a moderate degree of predictive power, meaning that a sizable percentage of the variability seen in the outcome variable may be explained by the predictor or predicts. At 0.471, the corrected R-squared, which accounts for sample size and predictor count, is marginally less. By making this modification, the predictive ability of the model is kept from being overestimated. The average difference between the values seen and the outcomes that the model predicts, or the standard error of the estimate, is 2.80166.

Table 6: R Square (Model Summary)

Model	R	R Square	Adjusted R	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change

			Square						
1	.688[a]	.473	.471	2.80166	.473	269.142	1	300	.000

a. Predictors: (Constant), FLBT

The influence of the predictor on the mathematical framework is further explained by the change numbers table. The model's increased capacity for explanation when the predictor(s) are included in comparison with when they are not is indicated by the R-squared change of 0.473. The model simply statistically significant overall, as indicated by the related F-statistic of 269.142 and the extremely low p-value (0.000), indicating that it is improbable that the link between the predictor(s) and the dependent variable is the result of chance.

Table 7: Coefficients (Beta and T-test coefficients)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	10.822	1.149		9.422	.000
	FLBT	.563	.034	.688	16.406	.000

a. Dependent Variable: VTMP

The findings of a regression analysis in which the independent variable FCLBT predicts the dependent variable (VTMP) are shown in the coefficient table (Table 4.4.2). The projected VTMP when FLBT is zero is indicated by the constant term in the model, 10.822. With other variables held constant, the standardized coefficient (Beta) for FLBT is 0.688, indicating that VTMP should rise by 0.688 units for every unit increase in FLBT. FLBT is a highly significant predictive of VTMP, as shown by its t-statistic of 16.406 and significant p-value of 0.000. These results demonstrate how significantly FLBT affected VTMP in the regression model.

4.6.1 Linear Regression H2

Table 8: R Square of H2 (Model summary)

					Change Statistics

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.523[a]	.273	.271	3.56866	.273	112.764	1	300	.000

a. Predictors: (Constant), FLBT

The findings of a regression analysis in which the independent variable FLBT predicts the dependent variable (not specified) are shown in the model's summary (Table 4.4.3). FLBT can account for about 27.3% of the variance in the dependent variable, according to the R-squared value of 0.273. After adjusting for the amount of samples and prediction count, the adjusted R-squared is 0.271, which is somewhat less. The average difference between the values that were observed and those that the model expected is 3.56866, which is the median error of the estimate. FLBT is a statistically significant indicator of the dependent variable, according to the change statistics, which also reveal an alarming R-squared change of 0.273 and an associated F-statistic of 112.764 with a p-value of 0.000.

Table 9: Beta and T-test coefficients of H2 Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.842	1.463		3.993	.000
	FLBT	.464	.044	.523	10.619	.000

a. Dependent Variable: OE

The findings of a regression study where the independent variable FLBT predicts the dependent variable (OE) are summarized in the coefficient table (Table 4.4.4). The anticipated OE when FLBT is zero is indicated by the constant term in the model, 5.842. The normalized coefficient (Beta) for FLBT is 0.523, indicating that, while leaving other variables equal, OE should rise by 0.523 units for every unit increase in FLBT. FLBT is a highly probable predictor of OE, as shown

by its t-statistic of 10.619 and significant p-value of 0.000. These results demonstrate the significant influence of FLBT on OE in the regression model, highlighting its significance in elucidating the differences in emotional tiredness experienced by research participants.

4.6.2 Linear Regression H3

Table 10: R Square of H3 (Modal Summary)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.532[a]	.283	.278	3.54970

a. Predictors: (Constant), TP, FLBT

Significant data regarding the link between the variables that are predicted (TP and FLBT) with the dependent variable may be found in the overview of the model used for regression. Each of the independent variables in the model may account for about 28.3% of the variability in the variable that is dependent, according to the R Square value of 0.283. The coefficient of prediction is critical because it measures the extent to which the data variability can be explained by the model.

A larger R Square indicates that, given the variables being predicted, the model is better able to forecast the variable in question. By accounting for the amount of covariates in the model, the

modified Chi-square Square—which is somewhat lower at 0.278—provides a more accurate assessment of how well the model performed on fresh, untested data. It is especially helpful for determining how generalizable the model is. Furthermore, the average deviation of the actual values above the ones expected by the method of regression is indicated by the median variation of the projection (3.54970). This measure aids in determining how accurate the model's predictions are. All things considered, these statistics provide a thorough assessment of the degree to which the variables that predict and the dependent variable, which are VTMP and FLBT, respectively, are related, as well as the degree to which the regression approach fits the data.

Table 11: Anova table [a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1489.169	2	744.585	59.092	.000[b]
	Residual	3767.519	299	12.600		
	Total	5256.689	301			

a. Dependent Variable: OE

b. Predictors: (Constant), VTMP, FLB

In light of the variables that predicted VTMP and FLB, the ANOVA table you provided evaluates the general validity and efficacy of the regression equation for identifying the dependent variable, OE. The three primary parts of the data set are the overall sums of rectangles, residue (error), and regression. Regression the total number of squares (SS) of 1489.169 shows how much of the variation in OE can be accounted for by FLB and VTMP. When the predictors are taken into account, the residual SS of 3767.519 indicates the unresolved variability that is left. The sum of the two yields a total SS of 5256.689, which represents all of the OE fluctuation in the sample. Degrees of freedom (DF) measure the quantity of separate data points that can be used to estimate parameters. In this case, the number all predictors (df for regression) is 2, that total all residual data points is 299, therefore the total amount of data points is 301. Regression and remainder mean squares (MS) are calculated by dividing the corresponding sums variable squares times their degrees of freedom. This yields information about average variability. The regression model's overall significance is determined by reducing MS regression with MS residual, yielding an F-statistic of 59.092.

Strong evidence opposing the null hypothesis is indicated by the corresponding p-value (Sig.) of.000, which implies that at least a single factor (VTMP or FLB) significantly influences the prediction of OE. Thus, the hypothesis of regression looks highly probable according to this ANOVA table and offers insightful information about the connection between VTMP, FLBT, or OE, confirming its appropriateness for additional study and interpretation in pertinent situations.

Table 12: Coefficient of H3

	Unstandardized Coefficients		*Standardized Coefficients*		
Model	B	Std. Error	Beta		

					T	*Sig.*
1	(Constant)	4.217	1.657		2.545	.011
	FLBT	.380	.060	.427	6.339	.000
	VTMP	.150	.073	.138	2.053	.041

a. Dependent Variable: OE

Table 13: Summary of Hypothesis

#	Hypothesis	Result
H1	Female leadership behavior positively impacts virtual team member performance.	**ACCEPTED**
H2	Female leadership behavior impact organizational environment of virtual team member performance.	**ACCEPTED**
H3	Organizational environment mediates the relationship between Female leadership behavior and team member performance.	**ACCEPTED**

The link among the predictors (FLB and VTMP) and the dependent variable (OE) in the regression model is explained in detail by the coefficients table you have provided. Every element in the table provides essential details for comprehending the interactions between these variables: The direct influence of every predictor onto the dependent variable is emphasized by the individualized coefficients. When both FLB and VTMP are zero, the anticipated OE is represented by the intercepts, or continuous term, of 4.217. Turning now to the predictors, the coefficient for FLBT is 0.380, meaning that, under all other circumstances, OE should rise by 0.380 units for every unit of rise in FLBT. After normalizing all variables, the standardized coefficients (Beta values) shed light on the relative significance of each predictor in predicting OE. VTMP has a beta value of 0.138, whereas FLBT stands out with a value of 0.427, suggesting a higher standardized impact on OE.

6. Conclusion

This research study aimed to explore the impact of Female connective leadership behavior on virtual team member performance with a focus on the software industry of Pakistan, while also exploring the moderating role of enterprise environment. It demonstrates a strong use of blended approaches. This study attempts to thoroughly examine the connections across managerial actions, collaboration, and organizational setting by fusing quantitative survey data with qualitative

insights from focus groups or interviews. This study emphasizes how crucial it is to take team well-being into account in order to maximize project performance. This study also indicates enterprise environment as a crucial element impacting project achievement, institutions can devise focused measures to alleviate its adverse consequences and cultivate a collaborative team atmosphere.

6.1 Research Limitations and Future Suggestions

Future study should try to replicate and expand these findings across various organizational settings. By using longitudinal studies to monitor variables across time, future study may be able to get around this restriction and gain a deeper comprehension of the temporal changes and causal processes at play. Furthermore, systematic variable manipulation using designs of experiments could yield more convincing proof of causal links. To gain a deeper understanding of how aspects like cohesiveness in the team, ways to communicate, and resolution of conflicts mechanisms affect the results of projects and team functioning, more research on these topics within agile team leadership contexts is recommended. Our knowledge about management dynamics especially organizational success in computer programming environments may be improved by looking into leadership philosophies other than connected leadership and the importance of mental agility in team performance.

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