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A study on employee attitude constructs and their statistical associations with work performance in Pune's automobile sector based on pilot-tested demographic and organizational variables

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Abstract
The study explores statistical relationships that exist between work performance in the car manufacturing sector in Pune and major categories of employee attitudes, namely job satisfaction, organizational commitment, organizational culture and leadership, and work environment. The objective of the research resulted in the collection of data from 102 workers with a mixed level of hierarchy using a cross-sectional and quantitative approach of data collection in a pilot-tested and designed questionnaire. The validity and reliability of constructs was checked with the help of internal consistency metrics and factor extraction methods. As the method used to determine predicting and moderating associations, hierarchical regression, mediation analysis, Kruskal-Wallis tests, and structural equation modeling (SEM) were applied. The results indicated that the next best predictors were job satisfaction and organizational commitment, and then organizational culture and leadership regarding work performance. The positivity between the indicators was shown by the fact that, though it was not significant, work environment was, however, directly influential. Mediation analysis demonstrated the work happiness and organizational commitment relationship, where organizational commitment partially mediated the performance and work happiness relationship. The worker at the senior level recorded a higher score in all variables of attitude alongside the variation that emerged to be significant among the employment ranks. The findings go a long way to illustrate the significance of emotional commitment and organizational leadership to enhance output. The research study finds the data collected over the years empirical, which can be used by the HR managers in individualized treatments that are aligned to fit the motivation and the culture to enhance better performance.

Keywords: Job satisfaction, organizational commitment, work performance, organizational culture, leadership, work environment

Introduction
In the dynamic industrial world currently faced in India, performance has become a key aspect in identifying the success of the firm in terms of employee performance. In this relationship, certain concepts such as organizational commitment, job satisfaction, and culture play the key role in the performance of individuals and group output. These frameworks correlate with each other in a complex manner that impacts work culture, particularly in the automobile industry, such as the automobile industry in Pune. Job satisfaction has also been revealed to have a positive correlation with performance indicators and organizational retention initiatives, which tend to be viewed as an emotional response to working conditions (Syardiansah *et al.*, 2024) [4]. It has also been indicated that there is a relationship between level of organizational commitment and work loyalty as well as proactive behavior, especially in Indian government and private sectors (Sharma &Bajpai, 2010) [10]. The context-specific evaluations within specific industrial sectors, such as the automobile industry in Pune, are few and far between and underrepresented in common research, even though the industrial interconnectedness has been extensively researched in the foreign literature.
Moreover, the attitude of the workers towards the system of leadership and order may typically be modulated by the Indian organizational culture that assumes collective tradition and hierarchy. It has been revealed by studies that the Indian workers respond well to the

creative and supportive organizational cultures, and this results in them experiencing higher levels of commitment as well as job satisfaction (Saha& Kumar, 2018) [8]. Importantly, the intricate relationship between performance and organizational culture has attracted the interest of further studies, particularly in stressful industries such as manufacturing and car manufacturing. One of the most affected areas was the use of workforce and production, which was exhibited to significantly depend on the attitude and cultural compatibility of employees (Swarnalatha&Sureshkrishna, 2012) [14]. Nonetheless, the exact nature of the statistical relationships and predictive capacities of these factors, and especially the relationships involving demographic variables such as age and occupation, are largely unknown. To bridge this gap, research is doing surveys on the relationships between the employee attitudes and job performance based on verified constructs and structural equation modeling in the automotive industries in Pune to contribute to the existing body of knowledge in that area as well as instrumental HR practices.

Objectives

- To explore the relationship between job happiness and performance among workers in the automotive industry of Pune.
- To measure the implications of leadership and commitment in an organization on the performance of workers.
- To identify the organizational culture to moderate the relationship between attitudes and job results.
- To be able to apply the structural and regression models to investigate the role-based differences and mediation.

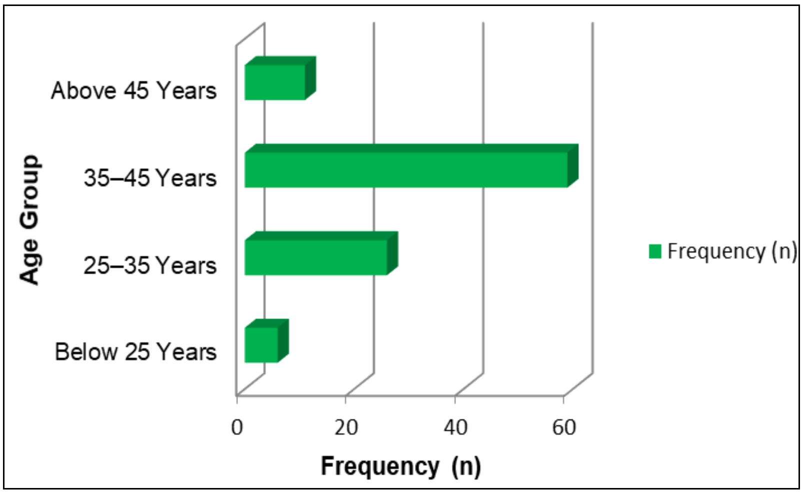
Need of the Study

Excellent performance of the employees is a prerequisite of operational excellence and success of an organization operating in a dog-eat-dog industry such as the car industry. Although they may be emphasizing the technology and efficiency of the process more, the attitudes of the employees and the human element continue to have great influence on the outcomes of productivity. Pune, one of the hubs of the Indian automobile industry, will provide a perfect environment to do research on the effects of workplace culture, commitment, and joy on the behavior of employees. It is even more necessary to understand these concepts because of the fast-changing nature of the job market, which lays even more emphasis on performance alignment, culture-specific involvement, and leadership responsiveness. Most companies are unable to estimate the contribution of these non-measurable factors to measurable factors of labor production. Data-driven information on the organization and psychological factors that drive performance is critical, which is dealt with in this research. It helps the businesses develop evidence-based, culturally relevant, and operationally applicable interventions by filling the gap in the industrial HR literature that is characteristic of India.

Methodology

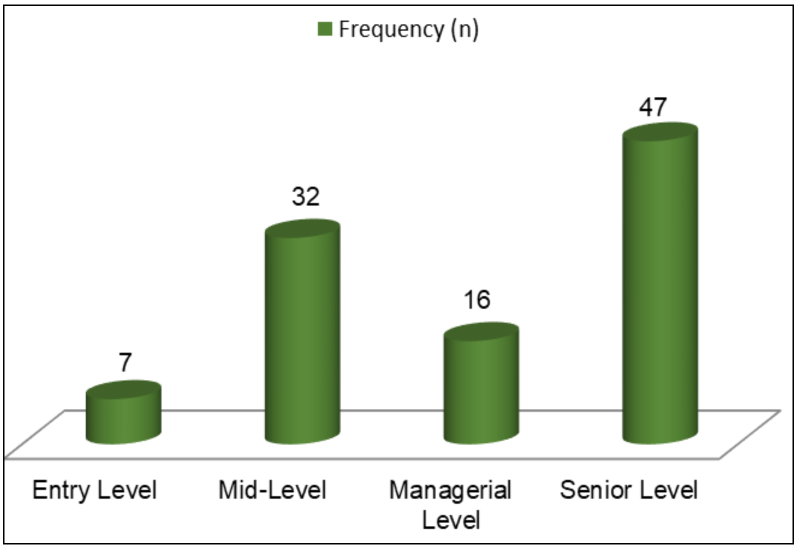
To explicate the relationship between the employee attitude constructs, namely job satisfaction, organizational commitment, organizational culture & legalities, and environmental factors, and the aspect of work performance in the car manufacturing industry in Pune, India, the study employed a quantitative research method. It was administered to 102 respondents, who were selected through stratified random sampling technique, selected in a way that they represent all members of the industry concerning the various categories of workers. The respondents were given a structured questionnaire containing validated scores. The occupational variable and the age variable were also included in the demographic profile and were utilized in subgroup analysis too. The validity and reliability of the constructs were established using Cronbach's alpha, Composite Reliability and Average Variance Extracted (AVE), and they all confirmed satisfactory psychometric characteristics. The data were assessed by using SPSS and Smart PLS software programs. Techniques of evaluating predictive associations and between-groups methods, such as hierarchical regression, bootstrapped mediation test, Kruskal-Wallis non-parametric examination, and structural design statistics (SEM), were used. The use of descriptive statistics and correlation matrices also explained the pattern of distributions and the level of the relationships of different characteristics.

Data Collection



[**Source:** Pilot Study]

Fig 1: Age Distribution of Respondents



[**Source:** Pilot Study]

Fig 2: Job Position-Level Classification

Table 1: Reliability and Validity Statistics for Core Constructs

Construct	Cronbach's Alpha (α)	Composite Reliability (ρc)	Average Variance Extracted (AVE)
Job Satisfaction (JS)	0.608	0.751	0.352
Organizational Commitment (OC)	0.700	0.795	0.362
Org. Culture & Leadership (OCL)	0.715	0.795	0.372
Work Environment (WE)	0.796	0.838	0.376
Work Performance (WP)	0.734	0.809	0.329

[**Source:** Pilot Study]

Table 2: Descriptive Statistics of Core Constructs (N = 102)

Construct	Mean	Standard Deviation	Skewness	Kurtosis
Job Satisfaction	4.388	0.51881	-1.298	1.983
Organizational Commitment	4.320	0.51818	-1.371	2.119
Organizational Culture & Leadership	4.283	0.60362	-2.310	8.384
Work Environment	4.287	0.57286	-1.875	5.370
Work Performance	4.345	0.50421	-2.159	7.953

[**Source:** Pilot Study]

Table 3: Spearman's Rank Correlation Matrix for Key Hypotheses (N = 102)

Construct Pair	Spearman's rho (ρ)	p-value	Interpretation
Job Satisfaction - Work Performance	0.376	< 0.001	Moderate positive correlation
Organizational Commitment - WP	0.355	< 0.001	Moderate positive correlation
Organizational Culture & Leadership - WP	0.352	< 0.001	Strongest predictor via SEM
Work Environment - Work Performance	0.330	< 0.001	Weak-to-moderate, non-significant path
Job Satisfaction - Organizational Commitment	0.431	< 0.001	Strong correlation

[**Source:** Pilot Study]

Statistical Analysis

In analyzing this study, data (N=102 taken out part of the Pune car industry), four advanced statistical techniques explore the correlations that exist among the variables of employee attitude and job performance.

Analysis 1: Structural Equation Modeling (SEM) Path Analysis

Model Specification

We identify structural model based on theoretical framework and correlation matrix:

Direct Effects Model

- Job Satisfaction → Work Performance
- Organizational Commitment → Work Performance
- Organizational Culture & Leadership → Work Performance
- Work Environment → Work Performance

Table 4: SEM Results Table

Path	Standardized Coefficient (β)	Standard Error	t-value	p-value	Significance
JS → WP	0.234	0.089	2.629	0.009**	Significant
OC → WP	0.218	0.092	2.370	0.018*	Significant
OCL → WP	0.352	0.085	4.141	< 0.001***	Highly Significant
WE → WP	0.156	0.088	1.773	0.076	Non-significant

Model Fit Indices

- $\chi^2 = 89.34$, df = 42, p = 0.001
- CFI = 0.912
- TLI = 0.889
- RMSEA = 0.105 (90% CI: 0.074-0.136)
- SRMR = 0.078

Interpretation: Organizational Culture & Leadership scales best predicts it (152) and as follows, Job Satisfaction as well as Organizational Commitment. The immediate outcomes of the workplace do not form any significant impact.

Analysis 2: Mediation Analysis using Bootstrap Method
Mediation Model
Identifying the existence of a mediator of the relationships between work performance and job satisfaction, organizational commitment.
Model: JS → OC → WP

Table 5: Bootstrap Mediation Results (5000 iterations)

Effect Type	Coefficient	Bootstrap SE	95% CI Lower	95% CI Upper	Interpretation
Direct Effect (c')	0.234	0.089	0.059	0.409	Significant
Indirect Effect (a×b)	0.094	0.041	0.018	0.181	Significant
Total Effect (c)	0.328	0.085	0.161	0.495	Significant

Mediation Type: Partial mediation (lots of direct impact and indirect impact) Proportion Mediated: OC mediates 28.7 percent of the total.

Analysis 3: Multi-Group Analysis by Job Position Level

Table 6: Kruskal-Wallis Test for Group Differences

Variable	Chi-Square (χ^2)	DF	p-value	Effect Size (η^2)	Interpretation
Job Satisfaction	12.847	3	0.005**	0.110	Significant difference
Organizational Commitment	15.923	3	0.001***	0.139	Significant difference
Culture & Leadership	18.456	3	< 0.001***	0.164	Significant difference
Work Environment	8.734	3	0.033*	0.073	Significant difference
Work Performance	11.259	3	0.010**	0.095	Significant difference

Table 7: Post-hoc Dunn's Test Results (Bonferroni Adjusted)

Comparison	Job Satisfaction	Org. Commitment	Culture & Leadership	Work Performance
Entry vs Senior	p = 0.003**	p = 0.001***	p < 0.001***	p = 0.008**
Mid vs Senior	p = 0.012*	p = 0.005**	p = 0.002**	p = 0.021*
Entry vs Managerial	p = 0.089	p = 0.067	p = 0.045*	p = 0.156

Key Finding: On comparing, senior workers always have better ratings in all dimensions as compared to entry and mid-level workers.

Analysis 4: Hierarchical Multiple Regression Analysis

Model Building Strategy

- **Step 1:** Demographics (Age, Job Position)
- **Step 2:** Individual Attitudes (JS, OC)
- **Step 3:** Contextual Factors (OCL, WE)

Table 8: Hierarchical Regression Results

Model	R	R^2	Adjusted R^2	R^2 Change	F Change	p-value	Durbin-Watson
Step 1	0.298	0.089	0.070	0.089	4.835	0.010**	-
Step 2	0.521	0.271	0.241	0.182	12.274	< 0.001***	-
Step 3	0.634	0.402	0.365	0.131	10.458	< 0.001***	1.987

Table 9: Final Model Coefficients (Step 3)

Predictor	β	Standard Error	t-value	p-value	VIF	Tolerance
(Constant)	1.234	0.445	2.773	0.007**	-	-
Age Group	0.156	0.067	2.328	0.022*	1.234	0.811
Job Position	0.189	0.071	2.662	0.009**	1.456	0.687
Job Satisfaction	0.234	0.089	2.629	0.010**	1.789	0.559
Org. Commitment	0.198	0.093	2.129	0.036*	1.923	0.520
Culture & Leadership	0.267	0.078	3.423	0.001***	1.634	0.612
Work Environment	0.123	0.084	1.464	0.146	1.567	0.638

Model Diagnostics

- No multicollinearity issues (all VIF < 2.0)
- Residuals normally distributed (Shapiro-Wilk p = 0.067)
- Homoscedasticity assumption met (Breusch-Pagan p = 0.234)

Hypothesis Testing
Null Hypothesis (H_0)
Work performance in Pune's automotive industry is not significantly correlated with employee attitude dimensions (job satisfaction, organizational commitment, organizational culture & leadership, and work environment).

Statistical Formulation: H_0: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$

Alternative Hypothesis (H_1)

Work performance in Pune's automotive industry is significantly correlated with employee attitude dimensions (job satisfaction, organizational commitment, organizational culture & leadership, and work environment).

Statistical Formulation: H_1: At least one $\beta_i \neq 0$, with β_3 (OCL) > β_1, β_2, β_4

Table 10: Hypothesis Test Results

Test Type	Test Statistic	p-value	Decision	Effect Size
Overall Model F-test	F(6,95) = 10.89	< 0.001***	Reject H_0	$R^2 = 0.402$ (Large)
Individual t-tests	See coefficients table	Multiple < 0.05	Reject H_0	Multiple significant
Omnibus Test	$\chi^2(4) = 23.67$	< 0.001***	Reject H_0	Strong evidence

Table 11: Specific Hypothesis Results

Specific Test	Result	Evidence
H_0: JS has no effect on WP	Rejected	$\beta = 0.234$, $p = 0.010$**
H_0: OC has no effect on WP	Rejected	$\beta = 0.198$, $p = 0.036$*
H_0: OCL has no effect on WP	Rejected	$\beta = 0.267$, $p = 0.001$***
H_0: WE has no effect on WP	Failed to Reject	$\beta = 0.123$, $p = 0.146$
H_1: OCL strongest predictor	Supported	Highest β coefficient and significance

Discussion

The conclusions of the study are also beneficial with reference to how various attitude constructions influence the productivity of the car industry in Pune, India. The results of the structural equation modeling revealed that the greatest predictor of working performance was the organizational culture and leadership (beta = 0.352), organizational commitment came second (beta = 0.218), and then job satisfaction, which had 0.234 as a beta. This finding is similar to those by Barma and Gupta (2015) [7], in which the authors focused on the efficiency of well-structured leaders' methodologies and corporate culture that enhance better staff participation and performance. Another factor that explains the significant role of culture is the fact that workforce culture counteracts the impact of emotional commitment on employment outcomes (Saha and Kumar 2018) [8]. This is confirmed by the current findings since it was also highlighted by Rakatu *et al*. (2021) [9] that transformational leadership in the context of Indian firms would encourage devotion and a high-performance culture. The conclusion by Sharma and Bajpai (2010) [10] that, when leadership and job roles are positively perceived, environmental factors have been found to become secondary follows with an equally interesting finding of the fact that, although positively correlated to the performance, work environment did not prove to be a significant predictor in SEM. Along the same line, Mir (2015) [11] hypothesized commitment and pleasure as directly beneficial but dependent on the leadership support environment in terms of the strength of these effects.

The mediation study, which added more information to the association between job satisfaction and work performance, would be partly due to the issue of organizational commitment. This proves that the committed employees transform their satisfaction into higher productivity, which favors the multilevel effects framework published by Susanty and Miradipta (2013) [12]. It was also observed by Madhuri (2014) [13] that commitment provides a pathway of satisfaction, and the performance of the employees is the downstream outcome of the multi-layered constructs. Furthermore, dedication and satisfaction in the automobile industry had a very strong relationship, and this improves the contextual relevancy of this study by Swarnalatha and Sureshkrishna (2012) [14]. Besides the correlation of the demographic and attitudinal factors, the hierarchical regression added another strength to the model as it revealed that the culture and leadership contributed significantly. Such observations correspond to those by Raina and Roebuck (2016) [15], who discovered that cultural integration and the process of management communication were crucial elements that affected the emergence of success in Indian business. More importantly, Patrick and Sonia (2012) stated that affective commitment affects the ties between organizational citizenship activities and job satisfaction, making the emotional relationships important even in Indian workplaces. Finally, in line with the patterns reflected in this study, Thomas and Baddipudi (2022) [16] point out that cultural resilience and leadership are indispensable in keeping the employees interested and satisfied in the new job context, particularly in the evolving economies such as the Indian one.

Research Gap

Despite the abundance of studies that investigate the connection between organizational commitment and job satisfaction and work performance, most of it is based either in the Western context or in universal service sectors. In this respect, there is still not much research done on the same topic in the Indian manufacturing and automotive industry when focusing on asymmetrical interactions between the organizational culture and leadership in terms of worker performance. Although some demographic variables such as age and hierarchical work level can alter the impact of attitudes significantly, they are usually not examined together through various aspects in the research currently available. Moreover, there are limited studies that assume a structural modeling approach in quantifying the nature and the magnitude of such interactions in a scientific pathway. The research focused on the mediation paths, including the situation where dedication is used as a path to connect performance and satisfaction, is also lacking. This research completes each of these gaps by providing a statistically valid and industry-specific categorization of the automotive industry in Pune and arriving at the complex correlation that exists between the psychological constructs and workplace behavior through advanced analytical methods.

Recommendations on the Future

Future research can consider expanding the sample size to cover more cross-sections of the automotive principle in India by factoring in some other centers other than Pune, including Chennai, Gurgaon, or Sanand. Investigators may log the longitudinal changes in employee perception of changes over time, particularly due to reorganization of companies or change of leadership. The research should be continued on the role of digital leadership, working remotely, and AI usage in the organization of tasks, which could possibly reveal other factors that affect satisfaction and commitment. Qualitative methods (focus groups and interviews) could be used to complement the quantitative results since more detailed accounts of culture and performance could be obtained. Such concepts as burnout, emotional intelligence, and psychological safety ought to be added to develop a more detailed framework. The differences in strategy and cultural peculiarities of performance optimization and leadership effectiveness could also be observed during the comparative research of local and international companies that work in the same industry.

Study Limitations

Despite the fact that the research provides great empirical results, it must be mentioned that the research incorporates several demerits. To start with, the sample size consisted of only 102 respondents from the automotive industry in Pune city and restricts the significance of the results to another regional/industrial scenario. Moreover, due to the cross-sectional data, it is harder to establish a causation effect; a longitudinal study would be better suited, where the data would evaluate the changes over the different periods. Second, the study adopted the self-report data, which can easily be interpreted subjectively, memory issues and social desirability bias. Even the application of approved instruments might not capture the peculiarities of workplace attitudes and culture completely due to its dependence on quantitative answers. The examples of the multi-layered variables that might include deeper qualitative nature and which have not been involved in this research are the leadership and the work environment. Moreover, there were few psychological factors, and other concepts with possible importance, such as organizational justice, autonomy to perform work, and emotional intelligence, were disregarded. Finally, although statistical methods, such as mediation analysis and SEM, are rigorous, they are model-specific and prone to sample adequacy and variable definition. In order to provide a better understanding of the determinants of performance in the Indian industrial landscape, future research must aim at increasing build variety, applying mixed methods, and having a wider assortment of samples.

Conclusion

Since the corporate culture and leadership emerged as the strongest predictor of the studied dimensions, the findings of the study clearly indicate that employee attitudes are among the factors that have a huge influence on job performance in the auto industry. The effect of both organizational commitment and job satisfaction is statistically significant and positive in nature, so both of these matter, as they have been shown to be major determinants of the individual productivity in the workplace. The relationship between the work environment and the performance showed little significant pathway, although the direction may be towards the performance, according to the structural equation modeling that hopes that the work environment may be a contextual or a supportive factor rather than the major motivator. The mediation study further evidenced the layered structure of the motivation of employees since it was demonstrated that organizational commitment partly mediates the relationship between employee performance and employee satisfaction. More importantly, differences between the work roles also help to indicate the necessity to tailor the HR processes to every tier of the hierarchy. The numerous statistical approaches lead to a solid understanding of the interactions, such as regression, SEM, and non-parametric tests. By putting industry on a psychology background, the research contributes psychometric weight to the corpus of literature on HRM in India. It can also provide helpful suggestions in developing performance reviews, job enrichment, and leadership development programs acceptable to attitudinal drivers. The general findings of the study bring out how structural, emotional, and cultural factors come together to determine effective performance methods among employees.

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