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MODERATING ROLE OF SAFETY CLIMATE BETWEEN ORGANIZATIONAL CITIZENSHIP BEHAVIOUR AND EMPLOYEE PERFORMANCE IN CHEMICAL INDUSTRIES

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ABSTRACT
This study examines the relationship between organizational citizenship behaviour (OCB) and employee performance and assesses whether safety climate moderates this relationship in chemical industries in and around Chennai, Tamil Nadu. OCB refers to discretionary, extra-role conduct that supports coworkers and organizational functioning, whereas safety climate reflects employees' shared perceptions of management's priorities, practices and commitment concerning safety. A descriptive, cross-sectional research design is proposed. The required sample was estimated at 385; an additional 15% was planned to compensate for unusable responses, giving a target of approximately 443 questionnaires. After screening and discarding improperly completed questionnaires, 413 valid responses were retained. Respondents were selected using random sampling, subject to access to employee lists and site permissions. Content validity was assessed through expert review, and internal consistency was evaluated using Cronbach's alpha. For demonstration, hierarchical regression results indicate a positive association between OCB and performance and a positive interaction between OCB and safety climate.

KEYWORDS: organizational citizenship behaviour; safety climate; employee performance; chemical industry; moderation; Chennai.

INTRODUCTION
Chemical manufacturing involves process hazards, hazardous substances, high-temperature or high-pressure operations, and interdependent work routines. In such environments, employee performance is not limited to completing assigned tasks: it also includes helping colleagues, sharing relevant information, reporting unsafe conditions and supporting collective work. Organizational citizenship behaviour (OCB) captures discretionary contributions that extend beyond formal role requirements (Organ, 1988). These actions may support coordination and work quality, although excessive extra-role demands can also create strain if they substitute for adequate staffing or formal systems.
Employee performance commonly includes task proficiency and behaviours that contribute to organizational goals (Koopmans et al., 2011). Safety climate concerns employees' perceptions of how consistently leaders and systems prioritize safety in everyday decisions (Zohar, 1980). A supportive safety climate may strengthen the benefits of OCB by making helping, speaking up and cross-checking normal and valued. Conversely, where production targets visibly override safety, discretionary effort may be less likely to translate into sustainable performance. The present study therefore examines OCB and employee performance while treating safety climate as a potential moderator.

Critical Review of Literature
Organ's (1988) conceptualization positions OCB as discretionary behaviour that contributes to organizational effectiveness. Podsakoff et al. (2000) synthesized major antecedents and consequences of OCB and highlighted its relevance to individual, group and organizational outcomes. OCB can support performance through cooperation, coordination and reduced friction; however, the strength of its effect can depend on job design, leadership, workload and the way performance is measured.
Recent review work continues to refine the OCB evidence base. Fan et al. (2023) reviewed OCB and counterproductive work behaviour, noting that these behaviours have important organizational implications but are not simply opposite ends of one scale. Luthfiyana et al. (2024) mapped research trends on OCB and employee performance through a literature-based meta-analysis, reporting sustained scholarly attention to the association. These reviews support the relevance of the OCB–performance link but also point to the need for context-sensitive studies and clearer operational definitions.
Safety-climate research has moved beyond treating safety perceptions only as predictors of safety compliance. A systematic review by the authors of *The relationship between safety climate and safety performance (2022) reviewed 162 studies and found that safety climate is often examined as a predictor, while methodological limitations and common-method bias remain concerns. Amoadu et al. (2023), in a scoping review of 93 studies, reported that psychosocial safety climate can shape working conditions and moderate relationships involving job demands, health and performance. A 2024 systematic review by the Journal of Safety Research also highlighted the growing importance of psychological safety and psychosocial safety climate to employee well-being and performance.
Studies in high-risk settings make the safety context especially relevant. Naji et al. (2022) found that safety communication partially mediated the relationship between safety culture and safety performance among petrochemical employees. This indicates that safety-related perceptions and communication can shape behaviour at work, but it does not directly establish

that safety climate moderates the OCB–general performance relationship. The specific gap addressed here is the joint testing of OCB, general employee performance and safety climate as a moderator among chemical-industry employees in and around Chennai. The proposed moderation must be tested using an interaction term rather than inferred from significant main effects alone.

Problem Statement

Chemical-industry employees are expected to meet operational targets while adhering to strict safety procedures. OCB may improve coordination, assistance and team functioning, but its contribution to employee performance may depend on workplace conditions. A strong safety climate may encourage employees to direct discretionary effort toward safe and effective work. A weak safety climate may undermine the value of such effort or create conflicting production and safety signals. Existing safety-climate studies frequently focus on safety performance rather than general employee performance. Therefore, this study tests whether safety climate changes the strength of the OCB–employee performance relationship in chemical industries in and around Chennai.

Need for the Study

The study addresses a practical concern in a safety-sensitive industrial setting where teamwork and dependable individual performance are both essential. It extends OCB research by considering safety climate as a contextual moderator rather than only a direct predictor. Findings may help HR managers and plant leaders connect citizenship behaviour with safe work systems, supervisor communication and performance management. The Chennai industrial belt provides a relevant setting because it includes chemical and petrochemical operations with different job roles and risk profiles. The study also offers a local empirical framework that can be replicated across plants and compared with other industrial regions. Its contribution depends on using valid measures, transparent sampling and appropriate tests of interaction effects.

OBJECTIVES

1. To examine the respondents opinion about organizational citizenship behaviour and employee performance in chemical industries in and around Chennai.
2. To assess the moderating role of safety climate in the relationship between organizational citizenship behaviour and employee performance.

RESEARCH METHODOLOGY

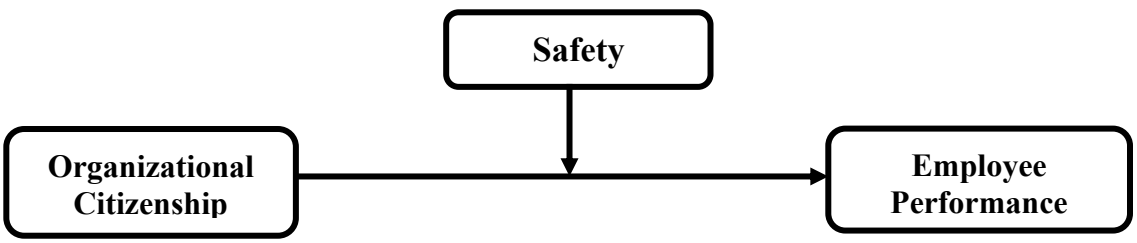
The study used a descriptive, cross-sectional survey design and was conducted in chemical industries in and around Chennai, Tamil Nadu. The population consisted of employees working in participating chemical and petrochemical units. In and around Chennai, 9 Chemical industries are located and 9917 employees are working in those companies. Among those 9917 employees, only managerial cadre employees from Assistant Manager to General Manager are selected as sample of this study, as they play crucial role in the development of the companies. Random sampling was used where a sampling frame of eligible employees was available and selections were made randomly; where access depended on managerial nomination or convenience, the sampling method should be reported accordingly.

The required sample size was 385; after adding a 15% fieldwork buffer ($385 \times 1.15 = 442.75$), the target was set at 443 questionnaires. Following screening, 413 properly completed questionnaires were retained, which is 28 more than the stated minimum, or approximately 7.3% above it; the buffer does not imply that all 443 questionnaires were returned or valid. Organizational citizenship behavior, safety climate, and employee performance were measured using established multi-item scales, with wording adapted only as needed for the chemical-industry context, and responses could be recorded on a five-point Likert scale. Content validity was assessed by experts in human resource management, occupational safety, and research methodology, followed by a small pilot test. Reliability was evaluated using Cronbach's alpha, with values of .70 or above commonly considered acceptable for exploratory research; item-total statistics and construct coverage were also reviewed. Cronbach's alpha indicates internal consistency but does not, by itself, establish validity.

Descriptive statistics and hierarchical regression analysis were performed in this study to find out the moderating effect of safety climate on the relationship between organizational citizenship behaviour and employee performance.

Research Framework

OCB is the independent variable, employee performance is the dependent variable, and safety climate moderates the OCB–performance relationship. The moderation hypothesis is supported only if the interaction coefficient is statistically significant.



Analysis and Interpretation

After collecting the questionnaire from the respondents, the data were entered and analyzed with SPSS software using various statistical tools. The outcome of the results are given hereunder.

Table: Descriptive statistics on Organizational Citizenship Behavior, Safety Climate and Employee Performance		
Organizational Citizenship Behavior	Mean	SD
Altruism	3.205	1.744
Conscientiousness	4.234	0.963
Sportsmanship	3.169	1.572
Courtesy	3.794	1.559
Civic Venture	3.508	1.185
Safety Climate	3.644	1.285
Employee Performance	3.791	1.054

Descriptive statistics show that the mean scores ranged from 3.169 to 4.234 across the study variables. Among the OCB dimensions, conscientiousness had the highest mean (M = 4.234, SD = 0.963), followed by courtesy (M = 3.794, SD = 1.559), civic virtue (M = 3.508, SD = 1.185), altruism (M = 3.205, SD = 1.744), and sportsmanship (M = 3.169, SD = 1.572). Safety climate had a mean of 3.644 (SD = 1.285), while employee performance had a mean of 3.791 (SD = 1.054). Overall, conscientiousness had the highest average score and sportsmanship the lowest. Altruism showed the greatest variability, while conscientiousness showed the least. Interpretations of whether the mean scores reflect low, moderate, or high levels depend on the response scale and its anchors.

Table: Hierarchical Regression Analysis – Moderating effect of Safety Climate when Organizational Citizenship Behavior Influence Employee Performance

Model	R	R Square	Adjusted R Square	F	Sig.
1	.844a	.712	.708	191.304	.000a
2	.847b	.717	.713	167.981	.000b

a. Predictors: (Constant), Altruism, Conscientiousness, Sportsmanship, courtesy, Civic Venture

b. Predictors: (Constant), Altruism, Conscientiousness, Sportsmanship, courtesy, Civic Venture, Safety Climate

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.404	.148		9.506	.000
	Altruism	.042	.015	.079	2.906	.004
	Conscientiousness	.095	.019	.158	4.932	.000
	Sportsmanship	.128	.037	.112	3.456	.001
	Courtesy	.809	.045	.898	17.832	.000
	Civic Venture	.151	.022	.215	6.877	.000
2	(Constant)	1.418	.150		9.451	.000
	Altruism	.043	.015	.080	2.929	.004
	Conscientiousness	.097	.020	.161	4.950	.000
	Sportsmanship	.128	.037	.112	3.449	.001
	Courtesy	.809	.045	.898	17.789	.000
	Civic Venture	.150	.022	.213	6.775	.000
	Safety Climate	.159	.024	.237	6.509	.000

a. Dependent Variable: Employee Performance

Excluded Variables[b]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	Safety Climate	.085a	2.964	.003	.136	.738

a. Predictors in the Model: (Constant), Altruism, Conscientiousness, Sportsmanship, courtesy, Civic Venture,

b. Dependent Variable: Employee Performance

A hierarchical regression was conducted to examine the role of safety climate in the relationship between organizational citizenship behavior (OCB) and employee performance. In Model 1, the five OCB dimensions—altruism, conscientiousness, sportsmanship, courtesy, and civic virtue—were entered as predictors. The model was statistically significant, R = .844, R^2 = .712, adjusted R^2 = .708, F = 191.304, p< .001, explaining 71.2% of the variance in employee performance.

In Model 2, safety climate was added. The model was statistically significant, R = .847, R^2 = .717, adjusted R^2 = .713, F = 167.981, p< .001. The explained variance increased by .005 (0.5 percentage points). Safety climate was a significant positive predictor of employee performance after controlling for the OCB dimensions (B = .159, SE = .024, β = .237, t = 6.509, p< .001). The OCB dimensions also remained significant positive predictors in Model 2: altruism (β = .080, p = .004), conscientiousness (β = .161, p< .001), sportsmanship (β = .112, p = .001), courtesy (β = .898, p< .001), and civic virtue (β = .213, p< .001).

These results indicate that safety climate explains additional variance in employee performance beyond the OCB dimensions and is positively associated with performance. They do not, however, demonstrate a moderating effect. The table includes safety climate as an additional predictor but does not report an interaction term between safety climate and OCB. To test moderation, the model must include the relevant safety climate × OCB interaction term(s), with their coefficients and the associated change in explained variance reported.

Major findings

- Conscientiousness had the highest mean among the OCB dimensions (M = 4.234, SD = 0.963), while sportsmanship had the lowest (M = 3.169, SD = 1.572).
- Altruism showed the greatest variability in responses (SD = 1.744); conscientiousness showed the least (SD = 0.963).
- Mean employee performance was 3.791 (SD = 1.054), and mean safety climate was 3.644 (SD = 1.285).
- The five OCB dimensions together explained 71.2% of the variance in employee performance. Each dimension was a significant positive predictor.
- Adding safety climate increased the explained variance to 71.7%, a 0.5 percentage-point increase. Safety climate was also a significant positive predictor (β = .237, p< .001).
- The results show positive associations between OCB dimensions, safety climate, and employee performance. They do not establish a moderating effect, because the regression did not include a safety climate × OCB interaction term.

Suggestions

- Since conscientiousness had the highest mean, chemical-industry managers could build on employees' strong sense of responsibility by recognizing reliable, careful, and rule-following work.
- Courtesy also had a relatively high mean, suggesting that cooperation and consideration among colleagues can be encouraged through effective communication and coordination.
- Sportsmanship had the lowest mean among the OCB dimensions, so managers could explore ways to support constructive responses to workplace challenges and reduce avoidable frustration.
- Safety climate had a mean of 3.644 and was a significant positive predictor of employee performance. Chemical industries could continue strengthening the safety climate as part of efforts to support performance.
- All five OCB dimensions were significant positive predictors of performance. Managers could therefore encourage these behaviors across teams, while recognizing that courtesy had the largest standardized coefficient in the reported model.
- Safety climate added a small amount of explained variance beyond the OCB dimensions. Its contribution should be considered alongside OCB when interpreting employee performance.
- The analysis did not test an interaction between safety climate and OCB, so no recommendation about a moderating effect can be drawn from these findings.

CONCLUSION AND FUTURE SCOPE

This study examined organizational citizenship behavior, safety climate, and employee performance in chemical industries in and around Chennai. Conscientiousness had the highest average score among the OCB dimensions, while sportsmanship had the lowest. All five OCB dimensions were significant positive predictors of employee performance. Together, they explained 71.2% of the variation in performance. Safety climate was also positively associated with employee performance when the OCB dimensions were taken into account. Adding safety climate increased the explained variance to 71.7%, a modest improvement. These findings suggest that both employees' constructive workplace behaviors and their perceptions of safety are relevant to performance. The results can help organizations recognize the value of responsible, cooperative, and safety-aware work practices. However, the analysis tested safety climate as an additional predictor, not as a moderator. Therefore, the study does not establish that safety climate changes the relationship between OCB and employee performance.Future studies could test moderation by including interaction terms between safety climate and OCB dimensions in the regression model. Research involving more chemical-industry locations and larger, more diverse samples could assess how broadly these findings apply. Longitudinal studies could also examine how changes in safety climate and OCB relate to employee performance over time.

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