

Employee Attributes and Trade Union Perceptions in the Maritime Sector: The Mediating Role of Employee Engagement in the Andaman and Nicobar Islands

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ABSTRACT

This study investigates how individual employee attributes shape trade union perceptions among maritime workers in Andaman and Nicobar Islands, with particular emphasis on mediating role of employee engagement. Addressing a critical gap in industrial relations literature, the study examines the underlying mechanism linking workforce characteristics to institutional attitudes in geographically isolated labor markets. A cross-sectional survey was conducted among 418 maritime workers between September 2023 and March 2024. Trade union perception was measured using a rigorously developed 22-item scale, while employee engagement was assessed using the validated UWES-17 instrument. Data were analyzed using PLS-SEM with 5,000 bootstrap resamples to test both direct and mediated relationships. Educational qualification ($\beta = 0.312$, $p < 0.001$) and years of service ($\beta = 0.274$, $p < 0.001$) emerged as significant predictors of employee engagement, which in turn exerted a strong positive effect on trade union perception ($\beta = 0.389$, $p < 0.001$). Mediation analysis revealed that engagement partially mediates relationship between education and union perception (IE = 0.121, 95% CI [0.068, 0.184]) and fully mediates the relationship between service tenure and union perception (IE = 0.107, 95% CI [0.051, 0.163]). Gender demonstrated a significant direct effect, whereas age was non-significant. This study advances industrial relations theory by integrating the Job Demands–Resources (JD-R) framework with institutional trust perspectives to demonstrate that employee engagement functions as a key psychological mechanism linking demographic attributes to union perception. It provides the first empirical evidence from an Indian island maritime economy, thereby extending union perception research to underexplored, geographically constrained labor contexts. The findings highlight the strategic importance of engagement-driven interventions for strengthening union effectiveness and worker alignment, particularly among contractual and lower-tenure employees in remote maritime sectors. Policy implications include need for employment stabilization and targeted workforce development initiatives to enhance both engagement and institutional trust.

Keywords: Employee Attributes, Trade Union Perception, Employee Engagement, Mediation Analysis.

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1. Introduction

Trade unions have played the role of institutional bulwarks in defending and promoting rights of working force in various industries. Specifically, in the industry of shipping, where danger is more imminent than ever before, work schedules are irregular, geographical locations are far from shore, and an imbalance of power prevails between employers and workers, union membership and the image of trade unions among workers become extremely important

[1,2]. The manner in which workers perceive the unions has a great impact on issues concerning collective bargaining, worker safety, grievance redressal, and labor relations at large [3].

Andaman and Nicobar Islands, consisting of 572 islands situated in Bay of Bengal, provide a unique lesson in terms of analyzing these factors. This region, which is geographically isolated, has a vulnerable environment, and relies heavily on maritime transportation and fishing, stands out from other parts of India due to its unique labor market for seafaring

workers [4]. However, despite its uniqueness, labor relations within this sector have not been systematically researched, making this topic an important research gap that this paper attempts to fill. A growing body of literature in organizational behavior and industrial relations has examined how individual-level employee attributes such as age, gender, educational background, tenure and employment type, influence attitudes toward trade unions [5,6]. However, an underexplored question concerns the mechanism through which these attributes shape union perceptions. We argue that employee engagement, defined as a positive, fulfilling, work-related state of mind characterized by vigor, dedication and absorption [7], functions as a key mediating variable in this relationship.

This study therefore pursues three objectives: first, to assess the direct effects of employee attributes on trade union perception; second, to examine whether employee engagement mediates these attribute–perception relationships; and third, to generate theoretically grounded recommendations for maritime labor policy in island economies. By doing so, this research contributes to industrial relations scholarship on maritime labor and organizational behavior literature on employee engagement [8].

2. Literature Review

2.1 Trade Union Perception: Theoretical Grounding

Literature on union perception is characterized by a multiplicity of theoretical underpinnings. Social Exchange Theory [9] posits that workers perceive unions based on cost-benefit analysis: workers perceive unions positively when the value of unions as facilitators of wage benefits, job security and grievance processes exceeds membership costs. Trust-based models of institutional behavior [10] argue that union perception depends on institutional trust, arising from socialization, experiences and organizational culture. Identity theories also focus on the role played by social identity in influencing union perception [11]. Freeman & Medoff [12] established that education and employment security were significant antecedents for union attitudes in their seminal research. Several subsequent studies have found tenure, occupation and form of employment to be critical factors in determining union perception among workers [5,13]. Studies carried out in Europe and Asia in ports revealed that ship-based contractual employees had a different perception about unions than land-based port workers [14].

2.2 Employee Engagement as a Mediating Construct

The measure of employee engagement, based on the UWES scale [7], includes vigor (energy and psychological stamina), dedication (importance and enthusiasm) and absorption (concentration on tasks). The reliability of the UWES scale is proven across different cultures even in developing countries [15,16].

According to Saks [17], antecedents of engagement also serve as predictors of organizational citizenship behavior and organizational attitudes. The theoretical underpinning of this study is the JD-R Model proposed by Bakker and Demerouti [18]. Resources like educational capital and experience lessen demands and increase employee engagement and the tendency for engaged employees to hold positive opinions about the institution, including trade unions, of which they are a part. No prior research has been done in this area linking employee engagement as a mediating factor between demographic characteristics and trade union perception in maritime islands, making this study novel.

2.3 Maritime Labor in Island Economies

The following are the unique features of labor in the maritime industry in small island economies. According to Wergeland [19], the island's maritime workforce is vulnerable because the geographic isolation traps them in one place while the existence of a few employers makes them powerless. The maritime workers work within the framework of Port Blair Port Trust, the Administration's ship department, and the private fishing and tourism sector, creating a three-pronged organizational structure [4].

Another important issue is the gender aspect. There has been a steady increase in female participation in the port administration, coastal tourism, and fisheries sectors in the global maritime workforce, which is traditionally dominated by men. However, this aspect has not been explored empirically in terms of how women view trade unions and whether engagement acts as a mediator in their gendered association [20]. Higher education among workers is another significant trend on the islands [21].

2.4 Hypotheses Development

Based on previous review of literature and theoretical model illustrated in Figure 1, the following hypotheses can be formulated. In order to allow for the disaggregated test of these hypotheses, H1 and H2 have been formulated based on the different employee attributes:

H1a-H1e: Age (H1a), gender (H1b), educational qualification (H1c), years of service (H1d) and employment category (H1e) significantly influence trade union perception.

H2a-H2e: Age (H2a), gender (H2b), educational qualification (H2c), years of service (H2d) and employment category (H2e) significantly influence employee engagement.

H3: Employee engagement positively and significantly influences trade union perception.

H4: Employee engagement is a mediator between each of the employee attributes and trade union perception.

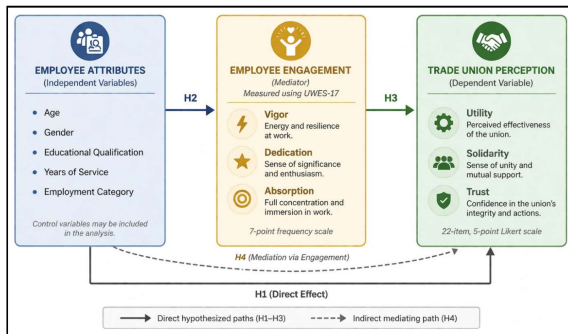


Figure 1. Conceptual Research Framework. Solid arrows denote direct hypothesized paths (H1–H3); dashed curved arrow represents the indirect mediation pathway (H4). Engagement is measured via UWES-

17

3. Research Methodology

3.1 Research Design

The research followed a quantitative cross-sectional survey design based on a post-positivist ontology framework, aligning with the hypothesis-testing methodology [22]. Data gathering took place during the period of September 2023 to March 2024.

3.2 Population and Sampling

All Andaman and Nicobar maritime personnel were included in this study. They comprised port workers, inter-island ferry workers, shipping company personnel, fisheries co-operative society workers, and maritime administration staff. Employment data from the Andaman and Nicobar Administration and Port Blair Port Trust labor departments showed 2,640 workers [4].

The study employed stratified random sampling with proportional employment type and island representation. A sample size of 338 was determined using the Krejcie and Morgan formula [23] for a finite population with a 95% confidence level and ±5% margin of error. For non-response adjustments, 520 surveys were given. 441 samples were returned (84.8% response rate), but 23 incomplete replies were discarded, leaving 418 for study.

Table 1. Demographic Profile of Respondents (N = 418)

Variable	Category	Frequency	Percent age (%)
Age	18–30 years	98	23.4
	31–45 years	187	44.7
	46–60 years	112	26.8
	Above 60 years	21	5.0
Gender	Male	334	79.9
	Female	84	20.1
Educational Qualification	Below Secondary	62	14.8

	Secondary/Higher Secondary	148	35.4
	Graduate	146	34.9
	Postgraduate and above	62	14.8
Years of Service	Less than 5 years	89	21.3
	5–10 years	134	32.1
	11–20 years	121	28.9
	More than 20 years	74	17.7
Employment Category	Permanent	241	57.7
	Contract/Temporary	177	42.3

Note. Source: Field Survey (September 2023 – March 2024). Sample predominantly male (79.9%), consistent with maritime sector demographics.

3.3 Measures

Employee Attributes: Determined using profiling, which uses structured age (four ordinal categories), gender (male/female), educational level (four ordinal categories), years of experience (four ordinal categories), and employment type (permanent/contract).

Employee Engagement: Measured using the Utrecht Work Engagement Scale (UWES-17) [7], comprising 17 items across vigor (6 items; $\alpha = 0.87$), dedication (5 items; $\alpha = 0.89$) and absorption (6 items; $\alpha = 0.85$), rated on a 7-point frequency scale (0 = never; 6 = always). Full-scale Cronbach's $\alpha = 0.91$.

Trade Union Perception: This study used a 22-item scale which is grounded upon the PUI model [6] and includes trust and solidarity variables. Three subscales represent the utility variable (8 items such as "My trade union is an effective protector of my salary and conditions of work"), solidarity variable (7 items such as "My trade union promotes my feeling of collective identity") and trust variable (7 items such as "My trade union's management acts in interests of its members"). Five-point Likert-type scale was applied (1 = strongly disagree; 5 = strongly agree). The preliminary test conducted among 40 respondents provided evidence regarding content validity of questionnaire. EFA confirmed three-factor structure (variance explained = 62.4%). Full scale $\alpha = 0.89$. All items had factor loadings >0.50 (0.52-0.81).

3.4 Analytical Strategy

All the analyses, including assessment of the measurement model and structural path analysis, were performed using one approach – the Variance Based Approach, as implemented through SmartPLS v.4 software [24,25]. This is an appropriate approach considering explorative nature of study and non-normality of several ordinal predictors. The following was done in succession: (a) assessment of reliability and validity (Composite Reliability, Average Variance

Extracted, HTMT Ratio); (b) structural path analysis with 5,000 bootstraps; (c) mediation analysis with regard to indirect effects, after Hair et al. [25]; (d) calculation of effect size according to Cohen's f^2 .

In order to control for possible common method variance, which could be of importance because of the use of self-reports in study of both constructs, Harman's single factor test was used. The explained variance by the first unrotated factor was just 24.7%, which means that common method variance is not a major issue [26]. Furthermore, to help mitigate possible threats, an anonymous survey questionnaire with mixed items was used.

4. Results

4.1 Descriptive Statistics and Bivariate Correlations

Table 2 presents means, standard deviations and Pearson correlation matrix. Overall mean trade union perception score was 3.41 (SD = 0.68), indicating moderately positive orientations. The mean employee engagement score was 3.87 (SD = 0.74). Educational qualification and years of service showed the strongest bivariate correlations with both engagement ($r = 0.38$, $p < 0.01$; $r = 0.34$, $p < 0.01$) and trade union perception ($r = 0.29$, $p < 0.01$; $r = 0.27$, $p < 0.01$). Age showed no significant correlation with trade union perception ($r = 0.08$, ns), consistent with prior evidence that age effects are subsumed by tenure once controls are applied [5].

Table 2. Means, Standard Deviations and Correlation Matrix (N = 418)

Variable	M	SD	1	2	3	4	5	6
1. Age	2.14	0.89	–					
2. Gender	1.20	0.40	.09	–				
3. Education	2.50	0.94	.14*	.07	–			
4. Years of Service	2.43	1.02	.16*	.04	.22*	–		
5. Employment Type	1.42	0.44	.18*	.11*	.29*	.24*	–	
6. Employee Engagement	3.87	0.74	.133*	.11*	.38*	.34*	.27*	–
7. Trade Union Perception	3.41	0.68	.08	.27*	.27*	.27*	.11	.46*

Note. * $p < .05$, ** $p < .01$ (two-tailed). M = Mean, SD = Standard Deviation. Gender: 1 = Male, 2 = Female. Employment Type: 1 = Permanent, 2 = Contract/Temporary.

4.2 Measurement Model Validity

Table 3 presents PLS measurement model results. All Composite Reliability (CR) values exceeded 0.85 and all Average Variance Extracted (AVE) values surpassed the 0.50 threshold, confirming convergent validity [24]. Discriminant validity was confirmed: the square root of each construct's AVE exceeded all inter-construct correlations and all Heterotrait-Monotrait (HTMT) ratios remained below 0.85 [24]. The overall model demonstrated acceptable fit: SRMR = 0.048, NFI = 0.92, indicating satisfactory model fit for PLS-SEM [25].

Table 3. Measurement Model, Reliability and Validity Indices

Construct / Sub-scale	Items	CR	AVE
Employee Engagement (full)	17	0.93	0.54
– Vigor	6	0.90	0.55
– Dedication	5	0.91	0.57
– Absorption	6	0.88	0.53
Trade Union Perception (full)	22	0.91	0.52
– Utility	8	0.87	0.51
– Solidarity	7	0.85	0.50
– Trust	7	0.88	0.53

Note. CR = Composite Reliability, AVE = Average Variance Extracted, α = Cronbach's Alpha, HTMT = Heterotrait-Monotrait ratio (maximum value across all construct pairs). All HTMT < 0.85 confirms discriminant validity [24]. '-' = sub-scale HTMT reported at full-scale level.

4.3 Structural Model: Direct Effects (H1a–H1e and H2a–H2e)

Table 4 presents the standardized path coefficients, standard errors, t-values, p-values and Cohen's f^2 effect sizes for all structural paths. Attribute variables explained 31.4% of the variance in employee engagement ($R^2 = 0.314$; $Q^2 = 0.198$, indicating adequate predictive relevance) and 42.8% in trade union perception ($R^2 = 0.428$; $Q^2 = 0.267$).

Regarding H2a–H2e (attributes → engagement): educational qualification ($\beta = 0.312$, $t = 5.84$, $p < 0.001$, $f^2 = 0.121$) and years of service ($\beta = 0.274$, $t = 4.97$, $p < 0.001$, $f^2 = 0.094$) emerged as significant predictors with medium effect sizes. Employment category showed a significant small-to-medium effect ($\beta = 0.198$, $t = 3.62$, $p < 0.001$, $f^2 = 0.049$). Gender had a marginally significant small effect ($\beta = 0.114$, $t = 2.03$, $p = 0.043$, $f^2 = 0.016$), while age was non-significant ($\beta = 0.071$, $t = 1.31$, $p = 0.190$, $f^2 = 0.006$). H2c, H2d, H2e are supported; H2b is marginally supported; H2a is not supported.

Regarding H1a–H1e (direct effects on union perception, tested with engagement in the model): gender showed a significant direct effect ($\beta = 0.189$, $t = 3.44$, $p < 0.001$, $f^2 = 0.044$) supporting H1b. Employment category had a significant effect ($\beta = 0.147$, $t = 2.68$, $p = 0.007$, $f^2 = 0.027$), supporting H1e.

Educational qualification showed a reduced but significant direct effect ($\beta = 0.108, t = 1.97, p = 0.049, f^2 = 0.014$), supporting H1c with partial mediation. Years of service was non-significant ($\beta = 0.074, t = 1.35, p = 0.178$), indicating full mediation; H1d is not supported as a direct path. Age remained non-significant ($\beta = 0.055, t = 1.02, p = 0.310$); H1a not supported.

Table 4. Structural Model, Direct Path Coefficients (N = 418)

Path	Hy p.	β	SE	t	p	f^2
Age → Engagem ent	H2 a	0.07	0.05	1.3	.190	0.00
Gender → Engagem ent	H2 b	0.11	0.05	2.0	.043	0.01
Educatio n → Engagem ent	H2 c	0.31	0.05	5.8	<.00	0.12
Yrs. Service → Engagem ent	H2 d	0.27	0.05	4.9	<.00	0.09
Empl. Type → Engagem ent	H2 e	0.19	0.05	3.6	<.00	0.04
Age → Union Perceptio n	H1 a	0.05	0.05	1.0	.310	0.00
Gender → Union Perceptio n	H1 b	0.18	0.05	3.4	<.00	0.04
Educatio n → Union Perceptio n	H1 c	0.10	0.05	1.9	.049	0.01
Yrs. Service → Union Perceptio n	H1 d	0.07	0.05	1.3	.178	0.00
Empl. Type → Union Perceptio n	H1 e	0.14	0.05	2.6	.007	0.02
Engagem ent → Union Perceptio n	H3	0.38	0.05	7.4	<.00	0.18

Note. β = standardized path coefficient, SE = standard error, f^2 = Cohen's effect size (small ≥ 0.02 ; medium ≥ 0.15 ; large ≥ 0.35). H1 direct effects estimated with employee engagement in the model. Decision column omitted; supported/not-supported noted in text per hypothesis.

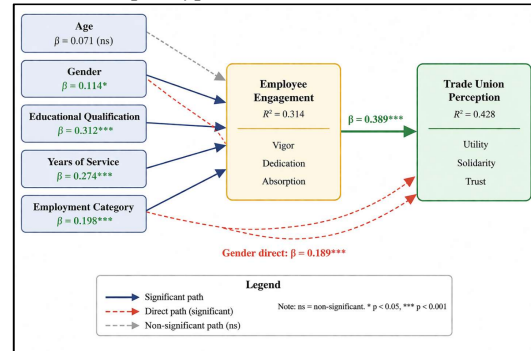


Figure 2. Final Structural Model with Standardized Path Coefficients. R² values: Employee Engagement = 0.314, Trade Union Perception = 0.428. *** p < .001; ** p < .01; * p < .05; ns = non-significant

4.4 Mediation Analysis: Employee Engagement as Mediator (H4)

Table 5 and Figure 4 display the bootstrapped indirect effects (5,000 iterations), with Variance Accounted For (VAF) values to determine mediation type following Hair et al. [25]. VAF > 80% indicates full mediation; VAF 20–80% indicates partial mediation; VAF < 20% indicates no mediation.

Educational qualification had a substantial indirect effect on union perception through involvement (IE = 0.121, 95% CI [0.068, 0.184]; VAF = 52.8%) and a significant direct effect ($\beta = 0.108, p = .049$), supporting partial mediation (H4 supported for H1c). The indirect influence of years of experience was statistically significant (IE = 0.107, 95% CI [0.051, 0.163]; VAF = 59.1%), however the direct impact was not, indicating full mediation (H4 supported for H1d). The indirect impact on gender was moderately significant (IE = 0.044, 95% CI [0.002, 0.097]; VAF = 18.9%), below 20% for meaningful mediation. Partial mediation for employment type (IE = 0.077, 95% CI [0.026, 0.139]; VAF = 34.4%). No mediation by age (CI=0). H4 is partly supported.

Table 5. Mediation Analysis, Bootstrapped Indirect Effects via Employee Engagement

Indirect Path	IE β	95% CI Lower	95% CI Upper	VA F (%)	Mediati on Type
Age → Eng → Union Perceptio n	0.028	-0.09	0.071	-	No Mediatio n
Gender → Eng → Union	0.044	0.002	0.097	18.9	No Meaning ful

Perception					Mediation
Education → Eng → Union Perception	0.121	0.068	0.184	52.8	Partial Mediation
Yrs. Service → Eng → Union Perception	0.107	0.051	0.163	59.1	Full Mediation
Empl. Type → Eng → Union Perception	0.077	0.026	0.134	34.4	Partial Mediation

Note. IE = Indirect Effect (standardized), Eng = Employee Engagement, VAF = Variance Accounted For = $IE / (IE + \text{direct effect}) \times 100$, '-' = CI spans zero, VAF not meaningful. Bootstrap iterations = 5,000. CIs excluding zero indicate significant indirect effects [25].

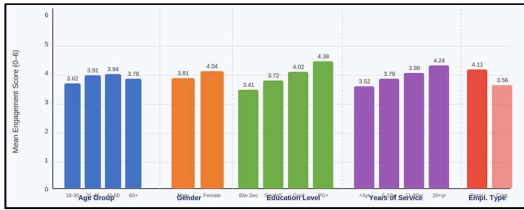


Figure 3. Mean Employee Engagement Scores by Attribute Groups (N = 418). Scale range: 0 (never) to 6 (always). Blw Sec = Below Secondary, Sec/HS = Secondary/Higher Secondary, PG+ = Postgraduate and above, Perm. = Permanent, Cont. = Contractual

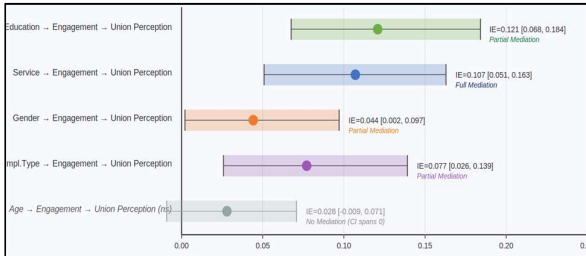


Figure 4. Mediation Effect Sizes, Bootstrapped Indirect Effects with 95% Confidence Intervals. Point estimates represent standardized indirect effects. Intervals not crossing zero indicate significant mediation. Age CI spans zero (no mediation)

5. Discussion

5.1 Educational Qualification and Tenure

Educational Qualification proved to be an important positive predictor for both Employee Engagement ($f^2=0.121$, moderate effect size) and Trade Union Perception, building on previous findings obtained in non-maritime contexts [5, 12]. Maritime employees

with higher education levels tend to have better awareness about collective representation structures, thus having more positive perceptions about unions. Since Education mediates Trade Union Perception in this case, the effects of education on trade union perception can be both direct via awareness and indirect via dedication and absorption, making the structure more noticeable.

Full mediation of the influence of years of service through engagement (VAF = 59.1%) is particularly striking. Experienced seafarers do not form positive perceptions about trade unions based solely on personal experience. It is rather the accumulation of engagement, increased vigor, dedication to the occupation, and craft involvement that lead to the more favorable union attitude. This finding supports the JD-R framework's expectation that resource accumulation contributes to engagement [18], providing an additional outcome to those already known in the literature related to beneficial effects of work engagement. Practically speaking, the large effect of engagement on union perception ($\beta = 0.389$, $f^2 = 0.183$, nearing the standard value for large effect of 0.35) demonstrates that union favorability cannot be viewed exclusively in terms of demographic factors but depends on personal work experience as well.

5.2 Gender Effects and Island Labor Dynamics

Of the results, the major impact of gender on the perceptions of trade unions, with women employees having more positive perceptions, is probably the most important from a practical perspective. Women maritime employees are more common in the contractual category in the Andaman and Nicobar Islands, where they earn lower wages than men. Their increased support for trade unions is probably because they have more knowledge about how collective bargaining can benefit them, in accordance with the vulnerability theory [6]. The gender effect on the perceptions of trade unions is direct rather than indirect, implying that gendered labor market experiences affect union favorability via other means [20].

5.3 The Non-Significance of Age

The non-significant association between age and union attitudes, even when adjusting for job tenure, suggests that it is occupational experience and not chronological age that influences union attitudes in this particular case. Such an observation contradicts findings related to a negative relationship between age and union attitudes in Western manufacturing [13], and it is consistent with findings from Asia, which demonstrate that tenure identity prevails over generation identity in relation to unions [14].

5.4 Employment Category and Contractualization

The positive direct influence of permanent status on both engagement and perception of trade unions proves that job security is a resource that contributes to employee engagement [17]. The permanent workforce in the maritime industry, who are more job secure, have access to formal mechanisms to address

grievances and union membership, are more engaged and perceive the trade unions positively. The partial mediating role (VAF = 34.4%) shows that job security not only impacts perceptions about trade unions but also has a direct relationship with trade union perception, which is an independent aspect from engagement.

6. Implications

6.1 Theoretical Contributions

This study makes three principal theoretical contributions. First, it integrates the JD-R model [18] with institutional trust theory [10] to produce a theoretically coherent account of how individual attributes shape union perception through the mediating lens of engagement. Second, it establishes employee engagement as a plausible and empirically tested mediating mechanism in the attribute–union perception relationship, a connection not previously established in the literature. Third, it provides the first systematic empirical investigation of union attitudes among Andaman and Nicobar maritime workers, extending maritime labor relations scholarship [19] into understudied island economy contexts and establishing a baseline for longitudinal and comparative future research [8].

6.2 Practical Implications

For maritime trade unions in Andaman and Nicobar Islands, findings demonstrate the strategic value of engagement-building as a route to strengthening union perception, membership and collective bargaining power. Unions should tailor programs to contractual workers, who show lower engagement and weaker union perceptions, through associate membership schemes, worker education initiatives and peer mentoring that leverages the higher engagement of longer-serving permanent workers.

To the Administration of the Andaman and Nicobar Islands and to maritime organizations, these findings emphasize the rationale behind regularizing contractual labor. The educational process, facilitated by maritime training and collaboration with institutions like the Indian Maritime University, is efficient ways of investing in worker capital that not only motivate but also create positive attitudes towards institutions [21].

7. Limitations and Future Research Directions

A few limitations worth pointing out include the following. First of all, a cross-sectional approach prevents causality inferences being made; instead, longitudinal research designs should be applied for this purpose. Secondly, the narrow geographic focus of this research on the Andaman and Nicobar Islands hampers any generalizations made without conducting further replications. Thirdly, even though Harman's one-factor solution showed that CMB is not an issue in this study, the self-reported data collected at the same point in time makes us unable to exclude completely shared-method bias. Finally, the significant gender

discrepancy in the sample (with 79.9% men), typical of the maritime sector, undermines the power of gender-based analyses.

Further research can focus on studying other mediators like organizational justice and psychological safety that work hand-in-hand with engagement. Research can be conducted comparing island territories in India or Southeast Asia where there is a maritime economy. Qualitative follow-up to further understand the lived experience of women workers in the maritime industry and contractual workers can complement this research.

8. Conclusion

This study examined the influence of employee characteristics on trade union perceptions in maritime employees of the Andaman and Nicobar Islands and found out that employee engagement serves as an important mediating variable for some particular attributes and their perceptions. Educational level and experience had a strong impact on employee engagement, which strongly affected union perception ($\beta = 0.389$, $f^2 = 0.183$). Gender had a strong impact on union perception independently, but age did not have any relationship with it.

In conclusion, the results indicate that union formation in a maritime economy such as the islands requires knowledge of the heterogeneity of the work force it serves. Engagement is not only the end result of organizational activities but also a structural mediating process whereby human capital is transformed into institutional legitimacy. In the Andaman and Nicobar Islands, where maritime work provides personal survival as well as social cohesion of an entire archipelagic community, investment in engagement is therefore investment in good labor relations.

Declarations

Funding Statement: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflict of Interest Statement: The authors declare no conflicts of interest.

Data Availability Statement: The anonymized dataset is available from the corresponding author upon reasonable request, subject to participant confidentiality.

Appendix. Trade Union Perception Scale, Sample Items and Factor Loadings

The 22 item Trade Union Perception scale was created by the researchers, and was validated using EFA (principal axis factoring with promax rotation; $N = 418$). Three factors were identified accounting for 62.4% of total variance. Items along with their standardized factor loading are listed below:

Appendix Table A1. Sample Items and EFA Factor Loadings for Trade Union Perception Scale

Sample Item	Utility λ	Solidarity λ	Trust λ
My union effectively protects my wages and	0.78	–	–

working conditions.			
I believe union membership leads to better job security.	0.74	–	–
Union negotiations result in fairer working hour arrangements.	0.71	–	–
I feel a strong sense of collective identity through my union.	–	0.79	–
My union brings maritime workers together as a community.	–	0.76	–
When one member faces injustice, the union stands for all.	–	0.69	–
My union's leadership acts in members' genuine interests.	–	–	0.81
I trust my union to fairly represent my concerns to management.	–	–	0.77
My union is transparent about how it uses members' dues.	–	–	0.72

Note. λ = EFA standardized factor loading. '–' indicates cross-loading < 0.30. Only representative items shown (3 of 8 utility, 3 of 7 solidarity, 3 of 7 trust). All loadings exceed 0.50. Eigenvalues: Utility = 4.82, Solidarity = 3.71, Trust = 3.21.

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