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Understanding and Reducing Alienation Among Assembly Line Workers: Insights from Leadership, Compensation, and Work Formalisation

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Abstract

Work on assembly lines, often highly standardised, repetitive, and time-pressured—a hallmark of Taylorised production—has frequently been linked to worker alienation. This study examines the factors that contribute to such alienation among blue-collar employees in the Indian automobile assembly sector. Data were collected from 346 workers using a structured questionnaire and analysed through structural equation modelling (SEM). Results indicate that employees' perceptions of fair compensation, supervisors' transformational leadership, the degree of work process formalisation, and engagement in counterproductive work behaviours (CWBs) are significantly associated with feelings of alienation. Based on these findings, the study suggests interventions to address alienation in mechanistic work environments, including implementing equitable compensation systems, developing transformational leadership skills among supervisors, and formalising work procedures. The first two interventions may additionally help reduce CWBs. This research contributes to the literature by proposing a mediational framework to better understand the complex interactions influencing alienation, offering practical insights for improving employee experience and engagement in structured industrial settings.

Keywords: Alienation, Assembly line work, Blue-collar employees, Compensation fairness, Counterproductive work behaviour, Leadership, Formalisation

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Introduction

In *Modern Times* [1], Charlie Chaplin powerfully portrays the grim realities faced by assembly line workers, who are subjected to monotonous tasks and reduced to mere components in a machine operated by factory owners [2]. This depiction vividly illustrates how highly repetitive and controlled work environments can impact the social and psychological well-being of workers, echoing Karl Marx's critique of capitalist labor processes [3].

Marx argued that creativity is an essential human trait that gives work meaning, enabling individuals to contribute to the needs of others. When work strips away this creative potential, alienation ensues [4]. Traditionally, alienation has been closely associated with Taylorised work, which emphasises repetitive, time-constrained, and highly standardised tasks that leave little room for autonomy or self-expression [5]. The automobile assembly line, in particular, has been considered a paradigmatic site of such alienation due to strict control over work processes [6, 7]. While foundational studies on alienation in assembly line contexts exist [8-10], they are largely decades old, highlighting a gap in contemporary research. Given that assembly line operations now employ a significant share of the manufacturing workforce [11], understanding workers' experiences and expectations is crucial for motivation and for preventing alienation [12].

Research indicates that the factors shaping job perceptions differ between blue-collar and white-collar employees. Blue-collar workers' psychological well-being is more influenced by tangible aspects such as pay and working conditions, whereas white-



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collar employees are primarily affected by the nature of their work [13, 14]. For example, higher wages can reduce turnover intentions among blue-collar workers but may have less impact on white-collar employees [15]. Beyond compensation, social support and supervisory behaviour can significantly affect blue-collar employees' outcomes due to their reliance on direct supervision and structured work interactions [16, 17]. Compared to white-collar roles, blue-collar jobs often provide limited autonomy, fewer opportunities for skill development, and restricted use of personal competencies, making occupational status a key determinant of perceptions of structural constraints and psychological well-being, including work alienation [18-20]. Responding to calls to examine factors influencing work alienation with attention to occupational status [18], this study investigates the antecedents of alienation among assembly line workers to inform human resource practices. Unlike previous studies rooted in Western industrial settings, this research develops a comprehensive model in the Indian automobile sector, integrating formalisation of work processes, transformational leadership, compensation satisfaction, and counterproductive work behaviour (CWB) within a single mediational framework. Prior literature often frames formalisation as a coercive mechanism that fosters alienation, yet emerging evidence suggests that structured processes may actually reduce alienation in modern assembly-line environments. By empirically testing the interplay of structural, psychological, and economic factors, this study provides nuanced insights into the multifaceted causes of work alienation, enhancing theoretical and practical understanding of employee experiences in a contemporary cultural and occupational context.

Theoretical Background and Hypotheses

This research examines how formalisation of work processes, supervisors' transformational leadership behaviours, compensation satisfaction, and counterproductive work behaviour (CWB) influence work alienation among assembly line employees in the automobile sector. These variables are selected due to their critical relevance in shaping blue-collar employees' experiences in highly structured industrial environments.

Contextual factors and work alienation

Assembly line work is often characterised by highly standardised procedures, rigorous task routines, and limited scope for autonomy or creative expression. In such environments, formalised workflows guide every aspect of task execution, ensuring consistency but also potentially constraining employees' discretion. Supervisors play a central role in this context, acting as primary agents of organisational socialisation and shaping workers' morale, motivation, and behavioural outcomes. Financial compensation also remains a dominant motivator for blue-collar employees, especially in developing countries where economic incentives are critical to sustaining engagement. Finally, examining CWB provides insight into how alienation may manifest in workplace behaviours, particularly in industries with histories of labour disputes and operational unrest.

By integrating these factors into a single framework, this study seeks to provide a comprehensive understanding of work alienation from multiple angles—structural, relational, and economic. Previous research has documented mixed findings: formalisation can reduce ambiguity and clarify roles but may also restrict autonomy and foster frustration; transformational leadership has been associated with increased engagement and reduced alienation; and alienation itself is linked to higher incidences of counterproductive behaviour. However, limited research has examined compensation satisfaction in conjunction with these variables, particularly in contemporary manufacturing contexts, creating a need for an integrative approach.

Formalisation of work processes and counterproductive work behaviour

Formalisation refers to the degree to which organisational rules, procedures, and guidelines are documented and enforced. While classical theories of bureaucracy emphasise the restrictive nature of formalisation, recent perspectives suggest it can also support clarity, reduce role conflict, and reinforce organisational norms. In industrial settings, the effect of formalisation on employee behaviour is nuanced: it may either prevent workplace deviance by providing clear expectations or contribute to disengagement and frustration if perceived as excessively rigid. Given these conflicting outcomes, the present study examines whether higher levels of formalisation influence counterproductive work behaviour among assembly line employees.

H1: Higher levels of formalisation in work processes are associated with increased counterproductive work behaviour.

Transformational leadership behaviour of supervisors and counterproductive work behaviour

Supervisory leadership significantly shapes employees' workplace experiences and behaviours. Transformational leadership, in particular, fosters engagement, commitment, and motivation through mechanisms such as intellectual stimulation, individualised consideration, inspirational motivation, and idealised influence. In assembly line contexts, where routine tasks and limited autonomy are prevalent, transformational leadership can provide social support, enhance perceptions of meaningful work, and reduce the likelihood of counterproductive behaviours. By guiding employees and encouraging proactive engagement, supervisors can mitigate feelings of alienation and its behavioural consequences.

H2: Supervisors' transformational leadership behaviour is negatively associated with counterproductive work behaviour.

Compensation satisfaction and counterproductive work behaviour

Compensation remains a key determinant of employee attitudes and behaviours, particularly for blue-collar workers whose primary motivator often revolves around financial rewards. Satisfactory pay can enhance perceived fairness, reduce dissatisfaction, and decrease the likelihood of negative behaviours, including CWB. Conversely, perceived inequities or inadequate compensation may exacerbate alienation, prompting disengagement and counterproductive actions.

H3: Higher compensation satisfaction is negatively associated with counterproductive work behaviour.

Work alienation as a mediating mechanism

Work alienation represents employees' psychological estrangement from their work and organisation, typically characterised by feelings of powerlessness, meaninglessness, and disconnection. Previous studies indicate that formalisation, leadership behaviour, and compensation satisfaction can shape alienation, which in turn influences CWB. Understanding alienation as a mediating construct provides insight into the pathways through which structural, relational, and economic factors impact employee behaviours.

H4: Work alienation mediates the relationship between formalisation, transformational leadership, compensation satisfaction, and counterproductive work behaviour.

Transformational leadership and counterproductive work behaviour

Transformational leadership serves as a crucial job resource by motivating employees, addressing their needs for support and meaningfulness, and buffering the negative effects of workplace stress. In line with the motivational pathway of the Job Demands-Resources (JD-R) model, abundant job resources such as transformational leadership foster positive attitudes and behaviours, making deviant or counterproductive actions less likely [21]. Based on this theoretical rationale, the following hypothesis is proposed:

H2: Supervisors' transformational leadership behaviour is negatively related to counterproductive work behaviour (CWB).

Compensation satisfaction and counterproductive work behaviour

Herzberg's motivation-hygiene theory suggests that while compensation may not inherently motivate employees, it functions as a hygiene factor capable of preventing job dissatisfaction [22]. Employees' perceptions of their pay—referred to as compensation satisfaction—reflect their attitudes toward the organisation's remuneration policies [23] and can influence both attitudinal and behavioural outcomes [24].

From a social exchange perspective, employees who perceive their compensation as unfair are likely to reduce discretionary efforts or even engage in deviant behaviours as a form of retaliation [25, 26]. Dissatisfaction with pay can foster feelings of being undervalued, which may weaken organisational ties and increase the likelihood of engaging in counterproductive behaviours [27, 28]. Empirical evidence supports this link, showing that employees dissatisfied with their remuneration are more prone to exhibit negative workplace attitudes and behaviours [29-31]. Therefore:

H3: Compensation satisfaction is negatively associated with counterproductive work behaviour (CWB).

Work alienation as a mediating mechanism

Alienation arises when workers' natural creativity and agency in transforming resources into products are constrained within capitalist production systems, leading to diminished autonomy and control [32, 33]. Seeman [34] conceptualised alienation through five dimensions—powerlessness, meaninglessness, normlessness, isolation, and self-estrangement. While many studies have used this multidimensional view to understand employee alienation, some scholars argue for a unidimensional approach, suggesting that alienation primarily reflects a general cognitive state of separation from work [35-37]. Following this approach, work alienation is understood here as a psychological estrangement or disconnection from one's job and organisational context [38].

Formalisation of work processes and work alienation

The relationship between formalisation and alienation is complex. Classical theories portray bureaucracy and formalisation as mechanisms of control that enhance efficiency but may alienate workers [39]. Job characteristics theory further highlights that formalised roles, with rigid procedures and limited discretion, can reduce skill variety and task identity, fostering meaninglessness among employees [40, 41]. High levels of formalisation often entail close supervision, deskilling, and rigid adherence to rules, which can exacerbate feelings of powerlessness and disconnection, particularly among blue-collar workers on assembly lines [42-44]. Historical studies in automobile manufacturing confirm that strict procedural controls contribute to significant worker alienation [6, 45].

However, contemporary research suggests that formalisation can also reduce alienation when implemented as an enabling structure. Well-designed and clearly communicated procedures provide clarity, minimise uncertainty, and offer employees predictable frameworks within which they can perform competently [46, 47]. Such formalisation allows workers to take pride

in their contributions, enhances role clarity, and can even foster a sense of fairness and consistency, mitigating the negative psychological impacts associated with alienation.

Transformational leadership and work alienation

Supervisors' behaviour significantly influences employees' psychological well-being, often above and beyond other workplace factors [48]. Employees frequently interpret supervisor actions as indicative of the organisation's commitment to them [49]. Research has shown that transformational leadership enhances psychological well-being by fostering positive perceptions of job characteristics, including role clarity, social support, meaningful work, and developmental opportunities [50-53]. According to the Job Demands-Resources (JD-R) framework, these job characteristics act as resources—physical, social, and organisational—that help employees achieve work-related goals [54]. Transformational leaders, by leveraging these resources, motivate employees to internalise organisational values and objectives, enhancing engagement and reducing the likelihood of alienation [20, 55].

In blue-collar contexts, workers may not clearly see how their daily tasks contribute to broader organisational goals [56]. Transformational supervisors can bridge this gap, helping employees understand the significance of their micro-level contributions to macro-level objectives, thereby enhancing the meaningfulness of their work and reducing feelings of alienation [37, 51, 57]. Supervisors' supportive behaviour, a key component of transformational leadership [58], helps assembly line workers adapt to psychologically demanding and alienating conditions [9].

Compensation satisfaction and work alienation

Research consistently shows that compensation significantly influences feelings of alienation [59-61]. Employees who perceive their remuneration as inadequate often experience negative emotions and stress [62]. Generally, employees' responses to their work are closely linked to their perception of the fairness and adequacy of compensation [63].

Studies indicate that higher satisfaction with pay correlates with lower levels of alienation [64]. Moreover, the strength of this relationship may depend on the value individuals place on financial rewards. Blue-collar workers, in particular, often prioritise extrinsic economic benefits and job security, making compensation a key determinant of psychological well-being [65].

Work Alienation and Counterproductive Work Behaviour (CWB)

Alienated blue-collar employees do not passively accept adverse work conditions; they may respond through strikes, protests, restricting output, or sabotage [66]. These forms of counterproductive work behaviour (CWB) are deliberate actions that violate organisational norms and threaten organisational or employee well-being [67]. Such behaviours can lead to negative outcomes, including financial losses, reduced job satisfaction, decreased organisational commitment, and lower performance [68, 69].

Deviance may arise as alienated workers seek opportunities for creative self-expression or challenges aligned with their skills, which are absent in routine or restrictive roles [70]. For instance, workplace theft has historically been interpreted as a way for workers to regain control, responsibility, and autonomy in otherwise monotonous or disempowering jobs [71]. Alienation fosters frustration and hostility, often manifesting as CWBs such as absenteeism, resistance, or sabotage [38, 72-75].

Hypotheses

Based on the literature review, the study proposes the following hypotheses:

- H4:** Formalisation of work processes is positively related to work alienation.
- H5:** Transformational leadership behaviour of supervisors is negatively related to work alienation.
- H6:** Compensation satisfaction is negatively related to work alienation.
- H7:** Work alienation is positively related to counterproductive work behaviour (CWB).
- H8:** Work alienation mediates the relationship between formalisation of work processes and CWB.
- H9:** Work alienation mediates the relationship between transformational leadership behaviour of supervisors and CWB.
- H10:** Work alienation mediates the relationship between compensation satisfaction and CWB.

Figure 1 illustrates the conceptual framework capturing all proposed hypotheses.

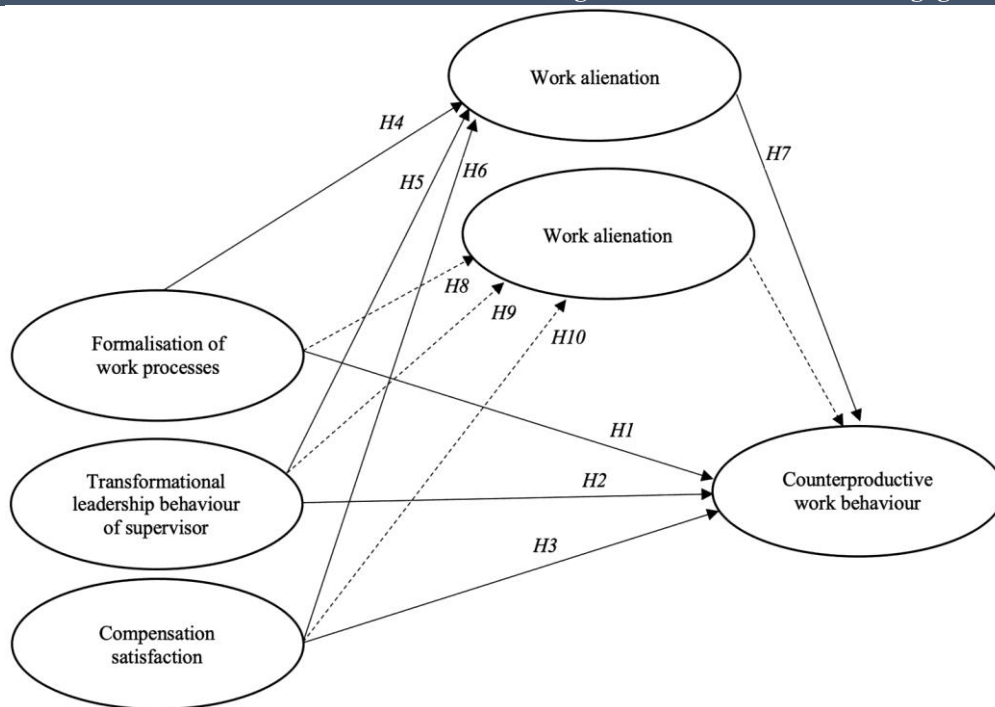


Figure 1. Hypothesised model proposing the direct and mediational relationships.

Methodology

Participants and data collection

The study targeted assembly line employees in seven automobile manufacturing and assembly plants located in northern India. Coordination with the human resources departments of each organisation facilitated the distribution of the questionnaires. Prior to participation, verbal informed consent was obtained, and participants were assured of complete anonymity and confidentiality. They were informed that the information provided would be used solely for academic research purposes and would not be disclosed to any external parties.

Out of 500 questionnaires distributed, 351 were returned, of which 346 were deemed usable, resulting in a response rate of 69.2%. This sample size exceeds the minimum recommendation provided by Hair *et al.* [76] for studies involving seven or fewer latent variables, each with at least three items and communalities above 0.50. All participants were male, with an average age of 27.97 years ($SD = 2.05$) and an average tenure in their current organisation of 6.99 years ($SD = 2.06$). In terms of educational background, 20.5% had completed vocational training, 59% held diplomas, and the remaining participants were graduates. This distribution reflects the typical demographic profile of assembly line workers within the studied organisations.

Given the self-reported nature of the data, several procedural steps were implemented to mitigate potential biases, including social desirability and acquiescence effects. Participants were reassured that there were no “right” or “wrong” answers to encourage candid responses. Additionally, verbal labels were provided for the extreme and midpoint values of the response scales. To further ensure data integrity, Harman’s single-factor test was conducted, which resulted in five factors with eigenvalues greater than one, and the first factor accounted for only 39.13% of the total variance, indicating that common method bias was unlikely to significantly influence the results.

Measures

Data were collected using a structured questionnaire with a five-point Likert scale, ranging from strongly disagree (1) to strongly agree (5), to measure all study variables. The degree of formalisation of work processes was assessed using a five-item scale adapted from Kerr and Jermier [77], which captured the extent to which job tasks and responsibilities were standardised and documented, with a sample item stating that job responsibilities are clearly written and communicated. Transformational leadership of supervisors was measured using four items from Carless *et al.* [78], focusing on the supervisors’ ability to inspire and motivate employees, including statements such as supervisors clearly communicating a positive vision for the future. Compensation satisfaction was measured using a four-item scale adapted from Nadler *et al.* [79], reflecting workers’ perceptions of the fairness and adequacy of their pay in relation to their efforts. Work alienation was assessed with eight items from Nair and Vohra [36], capturing the extent of psychological separation or disengagement from work, with items including feelings of disappointment or disillusionment with one’s job. Finally, counterproductive work

behaviour (CWB) was measured with four items adapted from Bennett and Robinson [67], evaluating employees' engagement in harmful or deviant workplace behaviours, such as exerting minimal effort on the job.

Data preparation and preliminary checks

Descriptive statistics and intercorrelations were examined for all constructs. Multicollinearity diagnostics indicated variance inflation factor values below 10 and tolerance values above 0.10, confirming that multicollinearity was not a concern in the analyses.

Table 1. Means, standard deviations and correlation coefficients of the study variables

	Study variable	M	SD	1	2	3	4
1.	Formalisation of work processes	3.69	1.02				
2.	Transformational leadership behaviour of supervisor	3.63	1.09	0.34**			
3.	Compensation satisfaction	3.55	1.10	0.33**	0.45**		
4.	Work alienation	2.35	1.01	-0.42**	-0.52**	-0.58**	
5.	CWB	2.30	0.94	-0.20**	-0.26**	-0.31**	0.39**

Note: n = 346; ** $p < 0.01$.

Measurement Models

Structural equation modeling (SEM) with maximum likelihood estimation was employed to evaluate both measurement and structural aspects of the study. To ensure that the constructs were distinct, a series of confirmatory factor analyses (CFA) were conducted. Model fit was assessed using multiple indices from different categories. Absolute fit was examined with the goodness-of-fit index (GFI) and the root mean square error of approximation (RMSEA), incremental fit with the comparative fit index (CFI) and Tucker-Lewis index (TLI), and parsimonious fit using the chi-square to degrees of freedom ratio (χ^2/df). According to established guidelines, values above 0.90 for GFI, CFI, and TLI, χ^2/df below 2, and RMSEA under 0.07 suggest a satisfactory model fit.

The initial step involved testing a three-factor model for the predictors of work alienation, consisting of formalisation of work processes, transformational leadership of supervisors, and compensation satisfaction. This model demonstrated strong fit ($\chi^2/\text{df} = 1.595$; RMSEA = 0.042; GFI = 0.959; CFI = 0.989; TLI = 0.986). In contrast, collapsing all predictors into a single factor led to a poorly fitting model ($\chi^2/\text{df} = 26.453$; RMSEA = 0.272; GFI = 0.470; CFI = 0.513; TLI = 0.415), confirming that the predictor variables were empirically distinct. To check for potential bias from common sources, all 25 measurement items in the study were loaded onto a single factor. The resulting model fit was very low ($\chi^2/\text{df} = 11.503$; RMSEA = 0.174; GFI = 0.492; CFI = 0.519; TLI = 0.475), indicating that common method bias was unlikely to influence the findings.

Next, a comprehensive CFA was conducted for the full measurement model, which included all five latent constructs. Each observed variable was assigned to its respective latent factor, with correlations freely estimated among constructs. The full model displayed excellent fit indices ($\chi^2/\text{df} = 1.243$; RMSEA = 0.027; GFI = 0.931; CFI = 0.989; TLI = 0.988). Standardised loadings were all statistically significant and exceeded 0.50, while composite reliability values ranged from 0.887 to 0.936, confirming internal consistency. Average variance extracted values ranged between 0.585 and 0.754, supporting convergent validity. Discriminant validity was verified by ensuring that both maximum shared variance and average shared variance were lower than the respective AVE for each construct, demonstrating that the constructs were empirically distinct.

Finally, to further validate discriminant properties, alternative models were tested by combining work alienation with predictor or outcome variables, resulting in two

Table 2. Measurement model comparisons. (Table view)

Models	χ^2/df	RMSEA	GFI	CFI	TLI	$\chi^2(\text{df})$	χ^2_{diff}	df_{diff}
CFA antecedents three factors	1.595	0.042	0.959	0.989	0.986	99(62)		
CFA antecedents one factor ^a	26.453	0.272	0.470	0.513	0.415	1719(65)	1620	3**
Full measurement model, five factors	1.243	0.027	0.931	0.989	0.988	329(265)		
CFA overall model two factors ^b	9.341	0.155	0.537	0.619	0.583	2560(274)	2231	9**
CFA overall model four factors ^c	3.462	0.084	0.795	0.890	0.877	931(269)	602	4**
CFA one factor model ^d	11.503	0.174	0.492	0.519	0.475	3163(275)	2834	10**

Note: χ^2/df = chi-square/degrees of freedom ratio; RMSEA = root mean square error of approximation; GFI = goodness-of-fit index; CFI = comparative fit index; TLI = tucker-lewis index; χ^2_{diff} = difference in chi-square; df_{diff} = difference in degrees of freedom.

n = 346; ** $p < 0.01$.

^a Compared with CFA antecedents three-factor model.

^b Compared with full measurement five-factor model.

^c Compared with full measurement five-factor model.

^d Harman's single factor model, compared with full measurement five-factor model.

Structural Model and Hypotheses Testing

While the causal steps approach proposed by Baron and Kenny [80] has traditionally been used to assess mediation, its limitations have been widely noted [81, 82]. Therefore, this study adopted the bootstrapping method with bias-corrected confidence intervals, as recommended by Preacher and Hayes [83], to test the hypothesised mediating effects. Indirect effects were evaluated using 5,000 bootstrap resamples, and 95% confidence intervals were calculated to determine their significance. Examination of the structural model and the associated path coefficients, representing standardised regression weights, indicated that most hypothesised relationships were supported, with the exception of H1 and H8. The confirmatory factor analysis conducted earlier provided sufficient evidence of model adequacy, with fit indices suggesting that the hypothesised model was well-aligned with the observed data ($\chi^2/df = 1.727$; RMSEA = 0.046; GFI = 0.903; CFI = 0.968; TLI = 0.964). Detailed results of the structural paths and mediation tests are summarised in **Tables 3 and 4**.

Table 3. Study variables and loading on each construct

Study variables	Loading on each construct
<i>Formalisation of work processes</i>	
F1	0.828
F2	0.876
F3	0.870
F4	0.899
F5	0.838
<i>Transformational leadership behaviour supervisor</i>	
TL1	0.867
TL2	0.873
TL3	0.864
TL4	0.870
<i>Compensation satisfaction</i>	
CS1	0.769
CS2	0.840
CS3	0.842
CS4	0.827
<i>Work alienation</i>	
WA1	0.747
WA2	0.794
WA3	0.677
WA4	0.741
WA5	0.730
WA6	0.768
WA7	0.673
WA8	0.683
<i>Counterproductive work behaviour</i>	
CWB1	0.799
CWB2	0.817
CWB3	0.790
CWB4	0.818

Table 4. Estimations of the structural model

χ^2/df	RMSEA	GFI	CFI	TLI
1.727	0.046	0.903	0.968	0.964

The proposed model was evaluated to determine how formalisation of work processes, transformational leadership, and satisfaction with compensation influence counterproductive work behaviours, both directly and indirectly through work alienation. Examination of the direct effects revealed that formalisation of work processes did not have a meaningful impact on counterproductive behaviours ($\beta = -0.087$; $p = 0.126$), indicating that structured procedures alone do not directly prevent deviant actions. In contrast, transformational leadership demonstrated a significant negative relationship with counterproductive work behaviour ($\beta = -0.155$; $p < 0.01$), suggesting that leaders who motivate and support employees help reduce such behaviours. Similarly, higher levels of compensation satisfaction were associated with lower engagement in counterproductive acts ($\beta = -0.255$; $p < 0.001$).

When considering work alienation as a mediator, formalisation of work processes exhibited a notable negative relationship with alienation ($\beta = -0.234$; $p < 0.001$), implying that well-defined procedures may help workers feel more connected and less estranged. Transformational leadership and compensation satisfaction also significantly reduced work alienation ($\beta = -0.354$; $p < 0.001$ and $\beta = -0.477$; $p < 0.001$, respectively), emphasizing the importance of supportive supervision and perceived fairness in remuneration in fostering engagement and reducing psychological detachment from work.

Work alienation itself was positively linked to counterproductive work behaviour ($\beta = 0.300$; $p < 0.001$), highlighting that feelings of disconnection or estrangement from one's job can trigger negative workplace behaviours. Mediation analysis confirmed that work alienation partially carries the effects of transformational leadership and compensation satisfaction to counterproductive behaviour. The indirect effect of transformational leadership via work alienation was significant ($B = -0.081$, 95% CI = -0.171 to -0.031), as was the effect for compensation satisfaction ($B = -0.112$, 95% CI = -0.214 to -0.047), illustrating that improving leadership quality and ensuring equitable compensation can reduce counterproductive behaviours by mitigating employees' sense of alienation.

Table 5. Mediation analysis using bootstrapping

	β estimate	SE	CR	p -value	Result
<i>Total Effect</i>					
CWB \leftarrow Formalisation of work processes	-0.087	0.047	-1.531	0.126	Insignificant
CWB \leftarrow Transformational leadership behaviour of supervisor	-0.155	0.044	-2.682	0.007**	Significant
CWB \leftarrow Compensation satisfaction	-0.255	0.047	-4.260	0.001***	Significant
<i>After the inclusion of the mediator (work alienation)</i>					
CWB \leftarrow Transformational leadership behaviour of supervisor	-0.049	0.048	-0.782	0.434	Insignificant
CWB \leftarrow Compensation satisfaction	-0.113	0.055	-1.606	0.108	Insignificant
Work alienation \leftarrow Formalisation of work processes	-0.234	0.044	-4.709	0.001***	Significant
Work alienation \leftarrow Transformational leadership behaviour of supervisor	-0.354	0.043	-6.816	0.001***	Significant
Work alienation \leftarrow Compensation satisfaction	-0.477	0.048	-8.425	0.001***	Significant
CWB \leftarrow Work alienation	0.300	0.075	3.733	0.001***	Significant

Note: $n = 346$; ** $p < 0.01$; *** $p < 0.001$.

The mediation analysis revealed that when work alienation was accounted for, the previously observed direct effects of transformational leadership and compensation satisfaction on counterproductive work behaviour became non-significant, indicating that work alienation fully mediates these relationships. Consequently, hypotheses H9 and H10 were supported. The comprehensive mediation outcomes are summarised in **Table 5**.

The proportion of variance explained in the dependent variables was also calculated using the squared multiple correlation coefficient (R^2). Together, formalisation of work processes, transformational leadership, and compensation satisfaction explained 40.8% of the variance in work alienation. When combined with work alienation, these predictors accounted for 15% of the variance in counterproductive work behaviour.

Discussion

This study explored the factors contributing to work alienation among blue-collar assembly line employees, formulating hypotheses grounded in the existing literature. The analysis examined the links between formalisation of work processes, transformational leadership, and compensation satisfaction with counterproductive behaviours, while also assessing their associations with work alienation as a mediating variable. The findings confirmed all hypothesised relationships except for H1 and H8.

Interestingly, formalisation of work processes showed a negative but non-significant relationship with counterproductive behaviour, a finding that contrasts with some theoretical expectations but aligns with other empirical evidence. For instance, Jino and Mathew [84] reported that formalisation had little effect on unethical behaviours, a broader category often encompassing counterproductive actions. Consistent with Kurtessis *et al.* [85], the results suggest that employees may refrain from deviant behaviours not because formalisation inherently restrains them, but due to awareness of potential disciplinary measures. Another plausible explanation relates to the measurement of formalisation, which relied on employees' perceptions rather than objective organisational metrics, potentially limiting the observed effects on counterproductive behaviour [77, 84, 86].

Additionally, the analysis revealed a significant negative association between formalisation and work alienation, consistent with studies by Organ and Greene [87] and Podsakoff *et al.* [88], suggesting that formalised processes can reduce feelings of estrangement. While traditional theories, including Marxist perspectives and job characteristics models, typically argue that

formalisation restricts autonomy and deskills workers [40, 41] and Weber [39] views bureaucracy as inherently alienating, contemporary research indicates that structured work processes can also serve an enabling function [46].

In highly controlled, low-autonomy environments like automobile assembly lines, standard operating procedures can provide essential guidance, clarify responsibilities, and capture lessons learned, allowing workers to perform complex and repetitive tasks more efficiently and safely. These procedures also facilitate knowledge sharing, encourage problem-solving, support continuous improvement, and promote two-way communication, helping workers feel competent and supported rather than constrained. As a result, formalisation in these contexts may mitigate alienation by creating a predictable, safe, and collaborative work environment.

This perspective aligns with practices in the Japanese automobile industry, particularly the Toyota Production System, where formal routines, standardised work methods, and quality control processes are explicitly designed to assist workers, foster teamwork, and support ongoing improvement [46, 89, 90]. These enabling structures demonstrate that formalisation, when implemented thoughtfully, can enhance learning, adaptability, and collaboration, providing a nuanced understanding of its impact on work alienation in contemporary blue-collar contexts.

The findings indicate a negative relationship between supervisors' transformational leadership and counterproductive work behaviour, suggesting that such leaders encourage employees to prioritize collective organisational goals over self-interest. This approach fosters an environment of high motivation and ethical standards, leaving little room for deviant behaviour. Empirical studies support this observation, showing that transformational leadership can reduce instances of counterproductive behaviour [91-94]. In line with Kessler *et al.* [95], employees under transformational leaders tend to refrain from harmful workplace behaviours, highlighting the role of leaders who show genuine care in mitigating such actions. Research by Walumbwa and Lawler [96] further suggests that transformational leadership may have a particularly strong impact in collectivist cultures, such as India, where group-oriented values are deeply ingrained from a young age [97], making such leadership especially effective in motivating and guiding Indian workers.

Supervisors act as intermediaries between management and blue-collar employees, and their behaviour strongly influences these workers [98]. The study confirms that transformational leadership is negatively linked to work alienation, aligning with the idea that such leaders empower and motivate employees to cope with otherwise alienating or challenging work conditions [41]. Transformational leaders provide tailored support through mentoring and coaching [51], offering both emotional and practical resources that help workers navigate workplace demands and reduce feelings of estrangement [72]. By supplying these resources, transformational leaders activate motivational mechanisms that enhance well-being and buffer employees against the psychological strain associated with high job demands. Prior research also shows that transformational leadership can maintain engagement even on days with heightened job pressures and reduce perceived stressors [21]. Engaged employees, characterized by vigour, dedication, and absorption, are less likely to experience alienation, indicating that transformational leadership helps employees feel purpose and involvement rather than cynicism or detachment. Kanungo [99] similarly argued that humanistic and empowering leadership enhances self-efficacy, which diminishes feelings of powerlessness and alienation [41]. Herzberg's motivation-hygiene theory [22] also supports this, emphasizing that leadership behaviours promoting intrinsic motivation are essential for sustaining a motivated, non-alienated workforce [100].

The analysis also validates H9, showing that work alienation mediates the relationship between transformational leadership and counterproductive behaviour. This aligns with social exchange theory [25], which posits that employees reciprocate the treatment they receive. Leaders who cultivate respect, growth, and a sense of belonging inspire positive reciprocation, reducing the likelihood of sabotage or deviance. Conversely, alienation arises when employees perceive the organisation or leadership as neglecting their needs, prompting retaliatory or counterproductive actions [101]. Transformational leaders maintain engagement and recognition, preventing this breakdown and thus limiting the risk of CWB. By fostering a supportive and participative environment, they counteract the effects of exploitative practices that could otherwise produce disengagement or detachment [41].

Similarly, compensation satisfaction was negatively associated with counterproductive behaviour, echoing the findings of Liu *et al.* [27]. Tangible rewards are particularly salient for blue-collar workers, while relational psychological contracts are less visible [102]. Workers who perceive inadequate compensation often experience anxiety and stress, which can contribute to undesirable behaviours [103]. Even under inspiring leadership, fair and satisfactory pay is critical to fully deter counterproductive tendencies. Compensation satisfaction also emerged as an important predictor of work alienation, indicating that when workers feel appropriately rewarded—both materially and symbolically—they experience fewer feelings of estrangement.

Work motivation literature explains that the sources of alienation vary depending on occupational priorities [35]. Blue-collar workers, for instance, generally prioritize financial security over intrinsic meaning in their work. As Jones *et al.* [104] observed, adequate pay is central for these employees, as it allows them to meet personal and family needs, in contrast to professionals who may seek self-expression and fulfilment. Parker [105] similarly notes that while low-skilled workers primarily pursue monetary compensation, professionals view work more as a source of identity and personal growth. Adequate remuneration also conveys recognition and social esteem, signaling that the organisation values the worker's contributions

[106, 107]. In the context of repetitive assembly line tasks, pay represents one of the few tangible acknowledgements of effort, and satisfaction with compensation can lend meaning and significance to otherwise monotonous work. Employees who feel fairly compensated perceive themselves as respected and integral to the organisation, reducing feelings of alienation such as meaninglessness and social isolation. Conversely, perceived underpayment signals undervaluation, potentially fostering estrangement and disengagement [108]. In essence, fair compensation not only meets practical needs but also validates employees' work, serving as a crucial mechanism to mitigate alienation among blue-collar workers.

The findings suggest that work alienation serves as a mediating factor between compensation satisfaction and counterproductive work behaviour (CWB). This aligns with evidence from a Turkish study in which pay fairness did not directly reduce CWB but lowered organisational cynicism, which in turn diminished CWB [109]. Similarly, the present study implies that mitigating negative work attitudes, such as alienation, may be a mechanism through which fair compensation curbs counterproductive behaviours. Research on unmet expectations supports this reasoning, showing that when employees perceive that promises or entitlements are not fulfilled, they experience alienation and may respond with CWB [101]. Conversely, meeting compensation expectations can reduce feelings of alienation and subsequently decrease the likelihood of counterproductive actions.

As hypothesised, work alienation was positively linked to CWB, suggesting that alienation can drive negative behaviours among blue-collar workers. This finding is consistent with prior studies [75, 101, 110, 111]. According to the Conservation of Resources (COR) theory [112], alienation represents a loss or threat to valuable psychological resources [113]. Employees typically draw key resources—such as a sense of purpose, control, social support, and esteem—from meaningful and well-supported work. When alienated, workers perceive an inability to obtain or maintain these resources [101]. Alienation further restricts access to interpersonal and task-related resources necessary for effective performance [72]. Consequently, employees experiencing alienation may limit effort, shirk responsibilities, or engage in behaviours like absenteeism, slowdowns, or other CWBs to compensate for lost resources. Empirical evidence indicates that alienated workers often “reduce effort,” resulting in higher absenteeism or decreased productivity [101, 114]. Alienation is also associated with lower conscientiousness [115, 116], a trait known to predict workplace deviance such as dishonesty and absenteeism [117].

From a theoretical standpoint, this study offers multiple contributions. First, it reinforces the relevance of Elton Mayo's human relations theory in modern workplaces. Mayo [118] drew attention to industrial workers' psychological needs, likening them to the shell-shocked soldiers of World War I, and highlighted the risks of alienation and management-worker conflict. He advocated a supervisory approach centred on active listening, guidance, and alignment of workers' goals with organisational objectives, emphasising that monetary rewards alone are insufficient. This supervisory focus resonates with transformational leadership, which prioritises employees' psychological and emotional well-being, fosters commitment, and aligns individual and organisational interests [119]. The current study advances human relations theory by demonstrating that fair compensation and transformational supervisory practices jointly reduce work alienation and curb CWB, providing empirical support for Mayo's principles in contemporary blue-collar assembly-line settings.

Second, the study builds on Adler and Borys' [46] framework of formalisation as both coercive and enabling. The findings indicate that in assembly-line contexts, formalisation can act as an enabling mechanism, associated with reduced alienation. This supports Adler's [89] argument that enabling formalisation is not incidental but a structural reality that empowers workers by clarifying roles, facilitating knowledge sharing, promoting learning, improving coordination, and fostering collective innovation. Unlike studies that depict formalisation as inherently rigid or constraining, this research highlights its supportive role, showing that clear procedures and standardized rules serve as psychological resources for assembly-line employees. The findings offer a more nuanced theoretical perspective on the enabling aspects of bureaucracy [120, 121].

Third, by applying the Job Demands-Resources (JD-R) model [54], this study demonstrates that transformational supervisory behaviour acts as a critical job resource for blue-collar workers, helping them cope with job demands and reducing work alienation. Prior JD-R research has primarily focused on engagement or strain, but this study extends the theory to encompass alienation, particularly among workers performing repetitive, low-autonomy tasks [122, 123]. Transformational leadership provides both instrumental and psychological support, buffering employees against the negative effects of alienation and mitigating counterproductive behaviours, thereby enriching the theoretical understanding of JD-R applications in industrial work contexts.

Fourth, drawing on Herzberg's motivation-hygiene framework [22], the findings indicate that while fair compensation may not inherently make assembly-line work intrinsically satisfying, it carries significant psychosocial benefits. Compensation satisfaction appears to provide a baseline sense of contentment, reducing the likelihood of alienation. When workers perceive their pay as fair and reflective of their effort and skill, they feel valued and empowered, making them less prone to engage in counterproductive behaviours. This supports social exchange theory [25], which posits that employees reciprocate fair treatment with positive behaviour. Similarly, equity theory [124] suggests that employees evaluate fairness by comparing their inputs and outputs to those of peers; perceived inequities can trigger frustration and withdrawal, while perceived fairness fosters a sense of justice and equilibrium. These findings not only highlight the importance of compensation satisfaction in

mitigating work alienation and CWB among assembly-line workers but also reinforce and extend established motivational theories in applied organisational contexts.

The observed positive relationship between work alienation and CWB further supports the Conservation of Resources (COR) perspective. Workers experiencing a loss of key psychological resources may adopt maladaptive strategies to regain a sense of control or self-worth, sometimes through counterproductive actions. For instance, a blue-collar worker feeling undervalued or powerless might intentionally slow production or damage equipment to reassert agency. Importantly, this study integrates multiple levels of analysis—micro (individual experience of alienation), meso (leadership influence), and macro (organisational structure and rewards)—thereby offering a more comprehensive understanding of CWB in assembly-line contexts. This multilevel approach contributes to the literature [125] by moving beyond single-variable explanations toward an integrated model of the antecedents and mechanisms that shape counterproductive behaviour.

A key contribution of this research is twofold: it consolidates previously established relationships into a single coherent model and sheds light on the factors influencing work alienation in an underexplored population—the blue-collar assembly-line workforce in India's automobile sector. By positioning work alienation as a mediating psychological mechanism linking structural, psychosocial, and economic antecedents to behavioural outcomes such as CWB, the study provides a multi-theoretical framework for understanding alienation that is rarely attempted in prior studies.

Practical implications

Understanding the factors that drive work alienation among blue-collar workers in highly structured and constrained environments is critical for reducing alienation and its negative consequences. Based on the findings, several actionable recommendations are proposed for organisations and HR practitioners seeking to curb alienation in assembly-line settings.

As noted by Mottaz [126], alienation often arises when employees' expectations or essential needs are unmet. Ensuring fair and transparent compensation is therefore a crucial step in preventing alienation among blue-collar workers. Organisations should adopt internally equitable and externally competitive pay policies. Fair compensation not only conveys value to employees but also reduces alienation and the likelihood of engaging in CWB. Beyond fairness, clear communication regarding compensation decisions is essential. If adjustments or constraints in pay are necessary, providing timely and transparent explanations can help mitigate negative reactions. For example, Greenberg's [127] research demonstrated that when organisations carefully explained pay reductions, employees' perceptions of inequity decreased, and incidents of workplace theft declined.

The present study reinforces that equitable pay serves not only as a retention tool but also as a psychological buffer against alienation-driven behaviours, particularly in high-demand, mechanistic work environments such as automobile assembly lines. HR practitioners can implement strategies such as regular town halls, Q&A sessions, or transparent discussions about organisational performance and its linkage to compensation to ensure employees feel informed, respected, and valued, reducing feelings of alienation.

In the Indian automobile sector, the coexistence of lower-paid contract labour with permanent employees performing identical tasks has often generated dissatisfaction and workplace unrest [128]. To mitigate such tensions, organisations should aim to minimise inequitable dual wage structures. Providing long-term temporary workers or contractors with fair pay and certain benefits—or adjusting their responsibilities to align with compensation—can reduce perceptions of injustice. A practical illustration of this is an automobile company that, following disputes triggered by higher raises for permanent staff, granted a 10 per cent wage increase to temporary workers to prevent unrest [128]. For HR departments, this underscores the importance of consistent and equitable compensation across all employee categories. Measures might include instituting a minimum 'living wage,' offering similar incentives such as health benefits or bonuses to contract staff, or converting high-performing temporary workers into permanent positions, thereby enhancing overall compensation satisfaction and reducing potential triggers for alienation and CWB.

Huang *et al.* [93] argue that organisational interventions targeting leadership tend to be more effective in curbing CWB than those focusing solely on individual traits. Leadership can be developed internally or recruited externally [129]. Improving supervisory leadership requires refining recruitment to prioritise desired behaviours, coupled with structured training programs, regular assessments, and ongoing feedback for reinforcement [130]. Evidence suggests that sub-behaviours of transformational leadership are trainable [131], and organisations stand to benefit from such training because the cost of alienation-driven CWBs may exceed the investment in leadership development. Training should emphasise specific behaviours, such as personalised mentoring, recognising worker contributions, and clarifying task alignment with organisational goals, which this study identifies as critical in reducing alienation and CWBs among assembly line employees. The Indian industrial landscape is marked by hierarchical management, high power distance, and centralised decision-making, often leaving blue-collar workers feeling powerless [132]. Transformational supervisory behaviours—such as maintaining open communication, listening to worker concerns, and demonstrating genuine care—can counteract this sense of disempowerment. Visible and accessible leadership on the shop floor fosters a sense of belonging, creating an inclusive 'we are all in this together' culture [133]. HR can further encourage participation through structured programs like quality circles

or Kaizen teams, where workers collaborate with supervisors to solve production issues. These initiatives operationalise the intellectual stimulation aspect of transformational leadership by valuing worker input in process improvements. For instance, quality circles in Indian manufacturing have empowered assembly line workers to propose and implement workflow enhancements [134].

Formalisation of work processes is another organisational mechanism that can mitigate work alienation among assembly line employees. Clearly defined policies, job descriptions, rules, and standard operating procedures (SOPs) provide a roadmap for handling unanticipated work situations, reducing uncertainty and potential errors. Properly designed formalisation acts as an enabling structure that clarifies the what, how, and why of work [135]. Formalisation also reinforces a transformational leadership climate, supporting productive energy and engagement in the organisation [136].

Organisations should design formal processes to function as supportive mechanisms rather than rigid controls. Involving assembly line workers in process refinement and feedback ensures SOPs remain practical and relevant, fostering two-way communication and making them dynamic tools rather than inflexible mandates. Mechanisms such as an ‘Andon system’ or a ‘stop button’ policy, which allow workers to signal problems and pause the line, exemplify empowering formalisation. Tata Motors, for instance, initially faced delays in workflow improvements because workers lacked authority to stop the line or suggest fixes [137]. Following the adoption of Toyota-style practices, including Andon boards and suggestion schemes, workers could raise issues in real time, accelerating resolution and increasing their sense of agency [137]. Formalising such empowerment signals trust in workers’ judgment and has the potential to reduce psychological estrangement, enhancing clarity and engagement on the shop floor.

Limitations and Directions for Future Research

Like all empirical studies, this research has certain limitations. A key concern relates to the data collection process, as information was obtained solely from workers, introducing the potential for common method bias. Although steps were taken to minimise such bias, it remains possible that the relationships among the variables studied were influenced by the single-source data. Future studies could address this by collecting data from multiple sources, such as supervisors or peers, to provide a more robust test of the hypothesised model. Another limitation arises from the cross-sectional design. While structural equation modelling allows for testing mediation pathways, the cross-sectional nature of the data does not permit conclusions about causality or temporal sequencing. Consequently, the findings should be viewed as indicative rather than definitive. Longitudinal or experimental research designs would help establish causal ordering and temporal precedence among the constructs.

Additionally, the study’s sample consisted exclusively of young male blue-collar workers in the Indian automobile industry, limiting the generalisability of the findings. The results may not extend to different cultural contexts, occupational categories, non-manufacturing work settings, female or mixed-gender workforces, or older employee groups. Future research should examine whether these findings replicate across diverse industries, countries, workforce compositions, and cultural environments. Furthermore, this study focused on four factors associated with work alienation. Subsequent studies could explore additional variables identified in contemporary literature, including organisational centralisation, which has shown mixed effects on employee behaviour [138], or technological factors, which may either mitigate or exacerbate alienation [139]. Finally, the study uncovered a counterintuitive negative relationship between formalisation of work processes and alienation among assembly line workers. This finding challenges established theoretical expectations and suggests the need for further research to determine whether this pattern holds in other settings and cultures, and whether environmental or cultural factors influence this relationship.

Conclusion

Given humans’ natural tendency to focus on negative experiences [140], alienation in one worker can influence peers, creating broader disengagement and scepticism toward the organisation. Therefore, organisations that proactively address work alienation are likely to improve overall workforce well-being. This study demonstrates that blue-collar workers who feel alienated are more likely to engage in counterproductive work behaviours than those who are engaged and motivated. Consequently, organisations should actively mitigate alienation by addressing the factors relevant to the occupational context of their employees.

Importantly, the findings highlight that alienation is not an inevitable outcome of industrial labour. Supportive organisational mechanisms—such as fair and transparent compensation, transformational supervisory behaviours, and enabling formalisation of work processes—are linked to lower levels of alienation, even in repetitive, low-autonomy assembly line roles. This perspective reframes alienation as a manageable issue rather than an unavoidable consequence of blue-collar work. Future longitudinal research can further evaluate these interventions, enabling organisations to create workplaces where assembly line workers feel recognised, supported, and actively engaged.

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