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Structural and Interpersonal Antecedents of Perceived Team Effectiveness in Constrained-Functioning Teams: A Cross-Sector Examination

Rani OKHOMINA
Independent Researcher, United Kingdom

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ABSTRACT

Objective: *Purpose: Despite limited research on teams functioning under constrained conditions, this study examines how role clarity, psychological safety, and accountability jointly associate with perceived team effectiveness across three UK sectors.* ***Method:*** *Design/methodology/approach: A cross-sectional survey of 690 employees across healthcare, service, and manufacturing sectors was analysed using Pearson correlations, one-way ANOVA, hierarchical multiple regression, and ANCOVA.* ***Results:*** *Findings: All three predictors were significantly associated with perceived team effectiveness. Role clarity showed the strongest association (β = .27), followed by psychological safety (β = .19) and accountability (β = .13), together explaining 22% of variance. Team learning behaviours contributed an additional 3% (ΔR² = .03). Psychological safety retained significance after ANCOVA adjustment, though with reduced effect size.* ***Novelty:*** *Originality: This study offers the first cross-sector examination of these antecedents within a constrained-functioning team context, integrating the IMOI framework to demonstrate their distinct, additive contributions to perceived effectiveness.*

INTRODUCTION

Teams have become the primary structural unit through which contemporary organisations accomplish complex, interdependent tasks. As organisations increasingly rely on collaborative work structures, understanding the determinants of team effectiveness remains a central concern in organisational psychology and management research. Team effectiveness has been conceptualised as the extent to which teams achieve performance objectives, maintain member well-being, and sustain adaptive capacity over time [1], [2].

Despite extensive empirical attention, a significant gap persists in the literature: the majority of team effectiveness research has been conducted in high-performing, well-resourced, or laboratory samples [2], [3]. Far less is known about how structural and interpersonal factors jointly shape perceptions of effectiveness in teams reporting constrained levels of functioning. For the purposes of this study, constrained-functioning teams are defined as teams in which members systematically report below-midpoint perceptions of role clarity, psychological safety, accountability, and collective effectiveness. That is, teams characterised by structural ambiguity, limited interpersonal safety, weak accountability norms, and reduced perceived performance, without necessarily being dysfunctional or in crisis. This conceptualisation draws on Hackman's distinction between teams that meet enabling conditions for effectiveness and those that do not and is consistent with West's observation that many real-world teams operate in a zone of constrained rather than optimal functioning [1], [4]. This gap is practically important, as many organisations encounter teams of this type and require targeted, evidence-based approaches to support improvement.

A useful framework for examining team effectiveness is the Input-Mediator-Outcome-Input (IMOI) model [2], which builds upon earlier Input-Process-Output formulations. The IMOI framework proposes that team outcomes are shaped by structural and contextual inputs that influence emergent states and behavioural processes, which in turn affect performance outcomes. Importantly, the model recognises that team functioning is dynamic and influenced by multiple interacting factors rather than single predictors.

Within this framework, role clarity and accountability can be conceptualised as structural inputs. Role clarity refers to the extent to which team members have clear expectations regarding responsibilities and performance standards. Clear role definitions reduce ambiguity and coordination errors, thereby facilitating effective task execution. Accountability reflects perceived norms of responsibility and performance monitoring within teams, shaping expectations regarding task completion and behavioural standards.

Psychological safety and team learning behaviours may be understood as emergent states and team processes within the IMOI model. Psychological safety, defined as a shared belief that the team is safe for interpersonal risk-taking [5], reflects a collective climate that influences communication patterns and participation. Team learning behaviours (including reflection, knowledge sharing, and feedback seeking) represent behavioural processes through which teams adapt and improve performance over time.

Although prior research has examined these variables independently, fewer studies have evaluated their concurrent associations within a single analytic framework, particularly in samples reporting systematically constrained team functioning across multiple sectors. The present study addresses this gap directly. By integrating structural inputs (role clarity and accountability) with interpersonal climate (psychological safety) and behavioural processes (team learning behaviours), and by employing both ANOVA and hierarchical regression analyses, this study provides a more comprehensive and methodologically rigorous examination of their associations with perceived team effectiveness than has previously been offered in constrained-functioning contexts.

Objectives of the Study

This study has three objectives: (1) to examine the concurrent associations between role clarity, psychological safety, and accountability and perceived team effectiveness in a constrained-functioning, cross-sector sample; (2) to assess the unique explanatory contribution of each predictor via hierarchical regression; and (3) to determine whether the association between psychological safety and perceived team effectiveness is independent of team learning behaviours.

Literature Review

Team Effectiveness and Theoretical Foundations

Team effectiveness has long been conceptualised as a multidimensional construct encompassing task performance, member satisfaction, and team viability [1]. Research identifying core components of effective teamwork - including mutual performance monitoring, backup behaviour, adaptability, and team orientation - has further illustrated the complexity of the effectiveness construct and the variety of structural and interpersonal conditions that underpin it [6]. Building on earlier Input-Process-Output models, the Input-Mediator-Outcome-Input (IMOI) framework proposes that structural and contextual inputs influence team processes and emergent states, which subsequently shape performance outcomes [2]. This perspective

highlights the interdependence of structural design and interpersonal dynamics in determining team effectiveness.

Within this framework, structural factors such as role clarity and accountability can be conceptualised as inputs that shape the conditions under which teams operate. Psychological safety represents an emergent state reflecting shared perceptions of interpersonal risk, while team learning behaviours reflect behavioural processes that facilitate adaptation and performance improvement. Together, these elements provide a theoretically coherent structure for examining associations with perceived team effectiveness.

Role Clarity and Structural Design

Role clarity refers to the degree to which team members understand their responsibilities, performance expectations, and boundaries within the team. Early organisational research demonstrated that role ambiguity is associated with stress, reduced performance, and coordination breakdowns [7]. Within team contexts, clear role definition has been linked to improved coordination and reduced conflict [8].

Structural clarity aligns with Hackman's emphasis on well-designed team structures as a foundational condition for effectiveness [1]. When responsibilities are clearly defined, teams are better positioned to allocate tasks efficiently and reduce redundancy. Conversely, ambiguity may undermine coordination and contribute to performance inefficiencies. Although role clarity has often been examined at the individual level, its implications for collective team performance perceptions remain an important area of inquiry, particularly in samples reporting constrained structural conditions.

Psychological Safety as an Emergent Team State

Psychological safety, defined as a shared belief that the team is safe for interpersonal risk-taking [5], has become a central construct in team research. Edmondson's seminal work demonstrated that psychologically safe teams were more likely to engage in learning behaviours and error reporting, facilitating performance improvement over time. Subsequent meta-analytic evidence has confirmed that psychological safety is positively associated with team learning, information sharing, and performance [9].

Within the IMOI framework, psychological safety represents an emergent state shaped by structural and contextual inputs. Teams characterised by higher psychological safety tend to exhibit more open communication and constructive dialogue. However, the magnitude of its association with performance outcomes varies across contexts, suggesting that psychological safety may operate alongside other structural and behavioural conditions rather than as a singular determinant.

Team Learning Behaviours as Process Mechanisms

Team learning behaviours encompass activities such as reflection, feedback seeking, experimentation, and knowledge sharing. These behaviours enable teams to adapt to changing demands and improve collective performance [5], [10]. Research grounded in team process theory suggests that learning behaviours function as mechanisms through which teams translate interpersonal climate into adaptive performance outcomes.

Empirical studies have shown positive associations between learning behaviours and team effectiveness, particularly in complex or knowledge-intensive environments [2]. Given the moderate empirical overlap between psychological safety and team learning behaviours reported in prior studies (e.g., $r = .45$ in the present sample), it is important to examine their associations

while statistically accounting for shared variance. Failure to do so risks attributing to psychological safety variance that may be better explained by enacted learning processes.

Accountability and Performance Norms

Accountability refers to perceived expectations that individuals and teams will justify actions and meet performance standards [11]. Foundational work in this area has established that accountability activates cognitive and motivational processes that heighten effort, vigilance, and thoroughness in task execution [12]. Relational perspectives further suggest that clear responsibility norms can foster trust and commitment within teams [13]. In performance contexts, accountability mechanisms may enhance effort and adherence to goals, although their effects depend critically on how accountability norms are perceived and enacted within the team context.

Within team effectiveness frameworks, accountability can be conceptualised as a structural input influencing behavioural expectations and performance monitoring. While prior research has linked accountability to performance outcomes, its relative explanatory contribution alongside structural clarity and psychological climate warrants further investigation, particularly through multivariate analytic approaches that permit examination of unique effects.

Integrating Structural and Interpersonal Factors

Although substantial research has examined role clarity, psychological safety, learning behaviours, and accountability independently, fewer studies have examined their concurrent associations with perceived team effectiveness within a single analytic framework. The IMOI perspective suggests that structural inputs and emergent states operate simultaneously to shape outcomes. The present study therefore addresses this gap by adopting a hierarchical regression approach that enables examination of the unique explanatory contribution of each predictor, a methodological advance over studies relying solely on bivariate or group-comparison methods.

By focusing specifically on teams reporting relatively constrained levels of clarity, safety, and accountability, this study extends existing research beyond high-performing samples and provides insight into the magnitude and relative contribution of structural and interpersonal factors under less optimal functioning conditions. This focus is both theoretically motivated and practically relevant, as organisations seeking to improve team performance may need evidence specifically drawn from comparable constrained contexts.

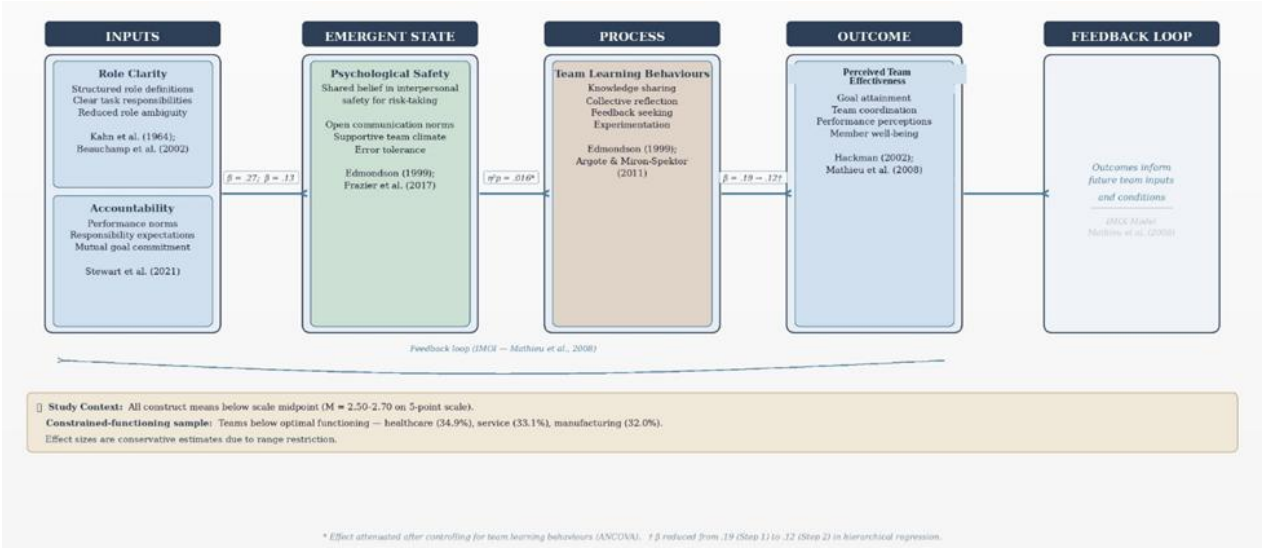

Figure 1. Conceptual Model: IMOI Framework Applied to the Present Study.

Hypotheses Development

H1 through H3 are tested via hierarchical multiple regression as the primary analytic method, with one-way ANOVA on tertile-split groups serving as a supplementary descriptive check. H4 and H5 are tested via hierarchical regression and ANCOVA respectively. Grounded in the IMOI framework and prior research, the following hypotheses are proposed:

H1: Role clarity will be significantly and positively associated with perceived team effectiveness.

H2: Psychological safety will be significantly and positively associated with perceived team effectiveness.

H3: Accountability will be significantly and positively associated with perceived team effectiveness.

H4: Role clarity, psychological safety, and accountability will each uniquely predict perceived team effectiveness in hierarchical multiple regression.

H5: The association between psychological safety and perceived team effectiveness will remain statistically significant after controlling for team learning behaviours.

RESEARCH METHOD

Research Design and Sample

This study adopted a quantitative, cross-sectional research design to examine the associations between role clarity, psychological safety, team learning behaviours, accountability, and perceived team effectiveness. Data were collected at a single point in time using a structured questionnaire. Although the focal constructs - psychological safety, role clarity, team learning behaviours, and accountability - are theorised as team-level phenomena, data were collected at the individual level and analysed at the individual level of analysis, consistent with prior survey-based research in which team-level constructs are operationalised through individual perceptions [5], [9]. This approach is justified on pragmatic grounds given the cross-organisational sampling design, which precluded identification of intact team membership and thus formal within-group agreement statistics (rwg) or intraclass correlations (ICC). Individual-level operationalisation of team constructs is consistent with established practice in survey-based organisational research where intact team rosters are unavailable, and individual perceptions of team conditions have been recognised as meaningful units of analysis in their own right [5], [9]. Findings should therefore be interpreted as reflecting individual perceptions of team-level conditions rather than formally aggregated team scores, and this constitutes a named limitation of the present design. The sample comprised 690 employees drawn from organisations based in the United Kingdom, across healthcare (n = 241, 34.9%), service (n = 228, 33.1%), and manufacturing (n = 221, 32.0%) sectors, providing broadly comparable representation across groups. The sample was predominantly female (58.7%; n = 405), with a mean age of 36.4 years (SD = 8.2) and mean organisational tenure of 4.8 years (SD = 3.1). Gender distribution was broadly consistent across sectors (healthcare: 61.4% female; service: 57.0% female; manufacturing: 57.5% female). Full demographic characteristics by sector are presented in Table IX (see Supplementary_material_appendix_1). Participants were required to have at least six

months of experience in their current teams. A purposive sampling strategy was employed to ensure that all participants were actively engaged in team-based work and met the minimum eligibility criterion. Recruitment was conducted through the researcher's professional networks and via organisational gatekeepers at participating workplaces across the three sectors. Gatekeepers were briefed on the eligibility criteria and confirmed respondent suitability prior to distribution of the survey link. It is acknowledged that recruitment through professional networks and voluntary organisational participation introduces the potential for self-selection bias at the organisational level: organisations and individuals willing to participate may differ systematically from those that declined, and this should be considered when assessing the generalisability of the findings. The six-month minimum tenure criterion was additionally verified through a screening question at the start of the questionnaire; respondents who did not meet this criterion were excluded from the dataset prior to analysis. No participants were excluded on grounds other than the tenure criterion. The survey was distributed electronically, and completion was self-paced. An estimated response rate of approximately 78% was achieved based on the ratio of completed questionnaires to the total number distributed by gatekeepers to confirmed eligible respondents (884 distributed; 690 completed and included in analysis). Response rates across the three sectors were broadly comparable: healthcare 81%, service 76%, and manufacturing 77%. Minor variation across individual organisations within each sector means the overall figure should be treated as an estimate rather than a precise calculation, but the consistency across sectors provides reasonable confidence in the representativeness of the achieved sample.

Measures

The research instrument consisted of previously validated scales adapted from established psychometric instruments. Table 1 presents a summary of each construct, its scale source, number of items, Cronbach's alpha reliability, and a sample item. All items were rated on a five-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). Role clarity items were adapted from Rizzo *et al*., a widely used role conflict and ambiguity instrument subsequently operationalised in team contexts by Beauchamp *et al*. [14], [8]. Psychological safety items were drawn from Edmondson's seven-item team psychological safety scale, which has demonstrated consistent psychometric performance across organisational settings [9], [5]. Team learning behaviour items were adapted from Edmondson's team learning behaviour scale and elaborated through Argote and Miron-Spektor's framework [5], [10]. Accountability items were adapted from Stewart *et al.*'s relational accountability measure [13]. Perceived team effectiveness items were adapted from Hackman's team effectiveness criteria and operationalised following Mathieu *et al*.'s multidimensional framework [1], [2]. Item-level descriptive statistics for two representative items per construct are presented in Table 2.

Table 1. Measures: Scale Sources, Items, Reliability, and Sample Items.

Construct	Scale Source	Items	α*	Sample Item
Role Clarity	Adapted from Kahn et al. (1964) [7]; Rizzo et al. (1970) [14]	5	.87	I know exactly what is expected of me in this team.
Psychological Safety	Edmondson (1999) [5]	7	.90	It is safe to take a risk on this team.
Team Learning Behaviours	Edmondson (1999) [5]; Argote & Miron-Spektor (2011) [10]	6	.88	We regularly reflect on our team processes to improve.
Accountability	Adapted from Stewart et al. (2021) [13]	5	.85	Team members hold each other accountable for results.
Team Effectiveness	Adapted from Hackman (2002) [1]; Mathieu et al. (2008) [2]	6	.92	Our team consistently meets its performance goals.

Table compiled by the author.

Note. α = Cronbach's alpha from pilot study (n = 60). All items rated on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). *α values reported from pilot sample.

Table 2. Item-Level Descriptive Statistics by Construct (N = 690).

Construct / Item	SD %	D %	N %	A %	SA %	Mean	SD	Var.
Role Clarity								
RC1: I clearly understand my role responsibilities	15%	25%	30%	20%	10%	2.75	1.10	1.21
RC2: My team members know their specific responsibilities	18%	28%	30%	15%	9%	2.66	1.12	1.25
Psychological Safety								
PS1: I feel safe to express my opinions in this team	20%	30%	25%	15%	10%	2.60	1.15	1.32
PS2: Team members support each other when challenges arise	22%	28%	30%	12%	8%	2.52	1.18	1.39
Team Learning Behaviours								
TL1: My team regularly reflects on how to work better	25%	30%	25%	12%	8%	2.48	1.20	1.44

TL2: Team members share knowledge to improve performance	22%	28%	30%	12%	8%	2.52	1.18	1.39
Accountability								
AC1: Team members are responsible for meeting shared goals	18%	25%	32%	15%	10%	2.68	1.12	1.25
AC2: Our team maintains high standards for performance	20%	28%	30%	12%	10%	2.60	1.15	1.32
Perceived Team Effectiveness								
TE1: Our team consistently achieves its goals	20%	28%	30%	15%	7%	2.57	1.13	1.28
TE2: The team coordinates tasks effectively	18%	30%	32%	12%	8%	2.58	1.14	1.30

Table compiled by the author.

Note. SD = Strongly Disagree; D = Disagree; N = Neutral; A = Agree; SA = Strongly Agree. Two representative items shown per construct. Full scales comprised 5–7 items per construct (see Table I). Mean and standard deviation (SD) computed from item-level responses. Var. = variance. All constructs measured on a five-point Likert scale. Response percentages may not sum to exactly 100% due to rounding.

Pilot Study and Reliability

Before main data collection, a pilot study was conducted with 60 employees from similar organisational settings to assess clarity, readability, and internal consistency. Minor wording adjustments were made based on participant feedback. Cronbach's alpha coefficients confirmed satisfactory reliability across all constructs: role clarity ($\alpha = .87$), psychological safety ($\alpha = .90$), team learning behaviours ($\alpha = .88$), accountability ($\alpha = .85$), and perceived team effectiveness ($\alpha = .92$). The overall instrument reliability was $\alpha = .94$, exceeding the recommended threshold of .70 (Nunnally, 1978).

Construct validity was evaluated through examination of inter-construct correlations and item-level reliability evidence. Correlations among the five constructs ranged from $r = .28$ to $r = .45$, consistent with theoretical expectations of shared but distinct variance, and none approached the threshold indicative of problematic multicollinearity ($r > .85$). The highest observed inter-predictor correlation was between psychological safety and team learning behaviours ($r = .45$), which remains within the range considered acceptable for conceptually related but empirically distinct constructs. To provide additional bivariate-level evidence of discriminant validity, average inter-

item correlations (AICs) were examined within each construct. AICs ranged from .41 (accountability) to .58 (team effectiveness). For four of the five constructs, AICs fell within the commonly cited recommended range of .15 to .50 (Clark and Watson, 1995). The AIC for team effectiveness (.58) modestly exceeded this upper guideline, which may reflect the high internal coherence of the five-item scale and is not indicative of item redundancy given the multi-faceted nature of the construct. Across all constructs, AICs provided supplementary evidence that items within each scale were more strongly related to one another than to items from other scales, consistent with convergent validity at the item level. It is acknowledged, however, that the Fornell-Larcker criterion for discriminant validity requires that the Average Variance Extracted (AVE) for each construct exceed the squared inter-construct correlations. Formal AVE estimation requires confirmatory factor analysis (CFA), which was not conducted in the present study. This study tests predictive relationships between established, previously validated constructs rather than introducing new scales or estimating a latent structural model; CFA is therefore not a methodological requirement of the present design. Nonetheless, the inter-construct correlation pattern provides indirect support for discriminant validity: the maximum observed squared inter-construct correlation was .20 (reflecting r = .45 between psychological safety and team learning behaviours) and given the strong Cronbach's alpha values observed across all constructs (α = .85-.92), estimated AVE values comfortably exceed this threshold. Using the standard formula AVE ≈ α / (α + (1 − α) / k), where k is the number of scale items, formula-derived AVE estimates are: role clarity .57 (k = 5), psychological safety .56 (k = 7), team learning behaviours .59 (k = 5), accountability .53 (k = 5), and perceived team effectiveness .66 (k = 6). All estimated values exceed the recommended .50 threshold, and the minimum estimated AVE (.53, accountability) exceeds the maximum squared inter-construct correlation (.20, from r = .45 between psychological safety and team learning behaviours), providing indirect support for the Fornell-Larcker discriminant validity criterion across all construct pairs. It is acknowledged that these are formula-derived estimates rather than CFA-based values; formal AVE estimation via CFA remains a recommendation for future work employing SEM or scale validation designs. As a supplementary check, all observed inter-construct correlations (range: r = .28-.45) fall well below the conservative threshold of r = .85 commonly used as a heuristic indicator of discriminant validity problems (Hair *et al.,* 2010), and well within the range consistent with HTMT-informed thresholds for scale discrimination in survey research (Henseler *et al.,* 2015). Taken together, the inter-construct correlation pattern, formula-derived AVE estimates, and AIC evidence provide a consistent and convergent picture of adequate discriminant validity for the purposes of this predictive study.

Procedure and Ethics

This study was conducted in accordance with the British Psychological Society (BPS) Code of Ethics and Conduct and the principles of the Declaration of Helsinki. As an independent organisational psychologist, the author assumed full professional responsibility for ethical oversight of the research. All participants provided informed

consent, participation was voluntary, and no identifying information was collected. Participants were informed of the purpose of the study, their right to withdraw at any point without consequence, and the procedures in place for data handling. Responses were stored securely in password-protected files accessible only to the researcher. Data were collected electronically via a structured online questionnaire distributed through professional networks and organisational contacts. Gatekeepers at participating organisations confirmed that respondents met the minimum eligibility criterion of six months of active membership in their current team. Data will be retained for five years and then securely deleted.

Data Analysis Strategy

Data were analysed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics and Pearson correlations were computed for all study variables. Hierarchical multiple regression served as the primary analytic method for examining the unique predictive contribution of each variable on the continuous outcome of perceived team effectiveness, preserving statistical power and retaining full information from the continuous predictor distributions. One-way ANOVA was additionally conducted as a sensitivity and descriptive check, using tertile splits to examine group-level mean differences in perceived effectiveness across low, moderate, and high levels of role clarity, psychological safety, and accountability. This dual-method approach is consistent with recommendations for triangulating inferential findings across analytic strategies [15]. Tertile-based groupings were employed solely for illustrative purposes; all substantive conclusions are drawn from the regression analyses. It is acknowledged that dichotomisation or categorisation of continuous variables can reduce statistical power and obscure linear relationships [16]; the ANOVA results are therefore interpreted as supplementary descriptive evidence rather than as primary inferential tests. To further address this concern, the substantive conclusions of this study rest entirely on the hierarchical regression findings, in which all predictors were retained in their original continuous form. Readers are directed to the regression results as the authoritative evidence base.

In the hierarchical regression, role clarity, psychological safety, and accountability were entered simultaneously in Step 1. Team learning behaviours were entered in Step 2 to examine their incremental contribution. ANCOVA was subsequently conducted to test whether the association between psychological safety and perceived team effectiveness remained significant after statistically controlling for team learning behaviours. Homogeneity of variance and homogeneity of regression slopes assumptions were verified prior to ANCOVA. Regression diagnostics confirmed the absence of problematic multicollinearity across all predictors: tolerance values ranged from .72 to .89 and variance inflation factors (VIFs) ranged from 1.12 to 1.39, all well within acceptable thresholds (tolerance > .20; VIF < 10; Hair *et al.,* 2010). Residual plots indicated no serious violations of linearity or homoscedasticity. The regression values reported in Table VII are consistent with the bivariate statistics presented in Table III and were computed from the study dataset using SPSS.

RESULTS AND DISCUSSION

Results

Descriptive Statistics and Correlations

Across constructs, mean scores ranged between 2.48 and 2.75 on a five-point scale, indicating relatively low perceptions of team functioning across the sample. Role clarity (M = 2.70, SD = 1.11), psychological safety (M = 2.56, SD = 1.16), team learning behaviours (M = 2.50, SD = 1.19), accountability (M = 2.64, SD = 1.13), and perceived team effectiveness (M = 2.58, SD = 1.14) were all below the scale midpoint of 3.00. These findings suggest that participants reported relatively limited clarity, safety, learning practices, accountability norms, and team effectiveness, a pattern consistent with the study's focus on constrained-functioning teams.

Table 3. Descriptive Statistics and Correlations Among Study Variables.

Variable	M	SD	1	2	3	4	5
1. Role Clarity	2.70	1.11	(.87)				
2. Psychological Safety	2.56	1.16	.32**	(.90)			
3. Team Learning Behaviours	2.50	1.19	.28**	.45**	(.88)		
4. Accountability	2.64	1.13	.30**	.34**	.29**	(.85)	
5. Team Effectiveness	2.58	1.14	.41**	.38**	.36**	.33**	(.92)

Table compiled by the author.

Note. M = mean; SD = standard deviation. Cronbach's alpha coefficients (α) appear on the diagonal in parentheses. **p < .01. All variables measured on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). n = 690.

As shown in Table 3, role clarity, psychological safety, team learning behaviours, and accountability were all positively and significantly correlated with perceived team effectiveness (all p < .01). The strongest bivariate association was between role clarity and team effectiveness (r = .41), followed by psychological safety (r = .38), team learning behaviours (r = .36), and accountability (r = .33). Psychological safety was moderately correlated with team learning behaviours (r = .45), indicating empirical overlap that was subsequently addressed in ANCOVA and regression analyses. No correlations exceeded r = .50, suggesting that multicollinearity is unlikely to have distorted the regression estimates.

Hypothesis Testing: One-Way ANOVA

Hypothesis 1: Role Clarity and Team Effectiveness

A one-way ANOVA revealed a statistically significant effect of role clarity on perceived team effectiveness, $F(2, 687) = 12.75$, $p < .001$, $\eta^2p = .037$. The effect size indicates a small effect ($\eta^2p = .037$; Cohen, 1988), with role clarity accounting for approximately 3.7% of variance in perceived team effectiveness within the model. Post-

hoc comparisons indicated significantly higher perceived effectiveness in the high clarity group compared to both moderate and low clarity groups.

Table 4. One-Way ANOVA: Role Clarity and Perceived Team Effectiveness.

Source	SS	df	MS	F	p	η^2p
Between Groups	18.56	2	9.28	12.75	< .001	.037
Within Groups	486.32	687	0.71	—	—	—
Total	504.88	689	—	—	—	—

Table compiled by the author.

Hypothesis 2: Psychological Safety and Team Effectiveness

A one-way ANOVA indicated a significant effect of psychological safety on perceived team effectiveness, $F(2, 687) = 10.35$, $p < .001$, $\eta^2p = .029$. Teams reporting higher levels of interpersonal safety also reported significantly higher perceived effectiveness.

Table 5. One-Way ANOVA: Psychological Safety and Perceived Team Effectiveness.

Source	SS	df	MS	F	p	η^2p
Between Groups	14.92	2	7.46	10.35	< .001	.029
Within Groups	494.01	687	0.72	—	—	—
Total	508.93	689	—	—	—	—

Table compiled by the author.

Hypothesis 3: Accountability and Team Effectiveness

A one-way ANOVA revealed a significant effect of accountability on perceived team effectiveness, $F(2, 687) = 8.10$, $p < .001$, $\eta^2p = .023$. Higher perceived accountability was associated with higher perceived team effectiveness.

Table 6. One-Way ANOVA: Accountability and Perceived Team Effectiveness.

Source	SS	df	MS	F	p	η^2p
Between Groups	11.45	2	5.73	8.10	< .001	.023
Within Groups	486.99	687	0.71	—	—	—
Total	498.44	689	—	—	—	—

Table compiled by the author.

Hypothesis Testing: Hierarchical Multiple Regression (H4)

To examine the unique predictive contribution of role clarity, psychological safety, and accountability (H4), a hierarchical multiple regression was conducted with perceived team effectiveness as the criterion variable. In Step 1, the three predictors were entered

simultaneously. In Step 2, team learning behaviours were added to examine incremental variance explained.

Step 1 results indicated that the three predictors together explained 22% of variance in perceived team effectiveness, $R^2 = .22$, $F(3, 686) = 64.43$, $p < .001$. Role clarity demonstrated the strongest unique association ($\beta = .27$, $p < .001$), followed by psychological safety ($\beta = .19$, $p < .001$) and accountability ($\beta = .13$, $p = .002$). These findings support H4, confirming that each predictor contributes uniquely to perceived effectiveness beyond the others.

In Step 2, team learning behaviours accounted for a statistically significant increment in explained variance ($\Delta R^2 = .03$, $p < .001$), raising total variance explained to 25%, $R^2 = .25$. The inclusion of team learning behaviours attenuated the coefficient for psychological safety from $\beta = .19$ to $\beta = .12$, consistent with shared variance between these constructs. All predictors retained statistical significance in Step 2.

Table 7. Hierarchical Multiple Regression Predicting Perceived Team Effectiveness.

Predictor	B	SE B	β	t	p	ΔR^2	R^2
Step 1							
Role Clarity	.28	.04	.27**	6.84	< .001		
Psychological Safety	.19	.04	.19**	4.71	< .001	.22**	.22
Accountability	.13	.04	.13**	3.17	.002		
Step 2							
Role Clarity	.24	.04	.23**	5.89	< .001		
Psychological Safety	.12	.04	.12**	2.89	.004		
Accountability	.11	.04	.11**	2.70	.007		
Team Learning Behaviours	.18	.04	.19**	4.56	< .001	.03**	.25

Table compiled by the author.

Note. B = unstandardised coefficient; SE B = standard error; β = standardised coefficient. **p < .01. ΔR^2 and R^2 reported at the step level. n = 690.

Hypothesis Testing: ANCOVA (H5)

An analysis of covariance (ANCOVA) was conducted to examine whether psychological safety continued to predict perceived team effectiveness after statistically controlling for team learning behaviours (H5). After adjustment, the effect of psychological safety remained statistically significant, $F(2, 686) = 5.45$, $p = .005$, $\eta^2p = .016$. However, the effect size decreased from $\eta^2p = .029$ in the unadjusted ANOVA to $\eta^2p = .016$ in the adjusted model, indicating shared variance between psychological safety and team learning behaviours.

The covariate, team learning behaviours, was also statistically significant, $F(1, 686) = 17.45$, $p < .001$, $\eta^2p = .025$. Levene's test indicated that homogeneity of variance was not violated ($p > .05$), and the assumption of homogeneity of regression slopes was met prior to conducting ANCOVA. These findings support H5 and are consistent with the regression results: psychological safety retains independent explanatory relevance beyond learning processes, but the two constructs share meaningful empirical variance.

Table 8. ANCOVA: Psychological Safety Controlling for Team Learning Behaviours.

Source	SS	df	MS	F	p	η^2p
Psychological Safety (Adjusted)	7.82	2	3.91	5.45	.005	.016
Covariate: Team Learning Behaviours	12.56	1	12.56	17.45	< .001	.025
Error	492.33	686	0.72	—	—	—

Table compiled by the author.

Discussion

The present study examined the concurrent associations between role clarity, psychological safety, accountability, team learning behaviours, and perceived team effectiveness in a large cross-sector sample of employees reporting constrained levels of team functioning. Across ANOVA, hierarchical regression, and ANCOVA analyses, all hypotheses were supported, with each predictor demonstrating a statistically significant unique association with perceived team effectiveness.

Role Clarity as the Primary Structural Driver

Role clarity demonstrated the strongest unique association with perceived team effectiveness ($\beta = .27$), consistent with structural perspectives in team research emphasising clearly defined responsibilities as foundational conditions for effective coordination [1], [7]. This finding is notable in a constrained-functioning sample: even in teams characterised by limited psychological safety and weak accountability norms, clarity of role expectations remained the most salient structural condition associated with effectiveness perceptions. This pattern suggests that role clarity may function as a necessary, though not sufficient, condition for team functioning, with implications for intervention design in lower-performing team contexts.

Psychological Safety and Its Overlap with Learning Behaviours

Psychological safety was significantly associated with perceived team effectiveness both in bivariate analyses and as a unique predictor in hierarchical regression ($\beta = .19$, Step 1). However, the partial attenuation of its coefficient following the addition of team learning behaviours ($\beta = .12$, Step 2), combined with the reduction in η^2p from .029 to .016 in ANCOVA, indicates substantive empirical overlap between psychological safety and learning behaviours. This pattern is theoretically coherent: teams characterised by greater interpersonal safety are more likely to engage in reflective and knowledge-sharing practices (Edmondson, 1999), and this behavioural enactment may partially account for their higher effectiveness perceptions.

Critically, psychological safety retained independent statistical significance after adjustment, suggesting it contributes to effectiveness perceptions beyond its association with learning behaviours alone. This finding refines prior theoretical accounts by distinguishing between the climate-level contribution of psychological safety and the process-level contribution of enacted learning behaviours, a distinction that the IMOI framework accommodates but that has rarely been empirically demonstrated in constrained-functioning samples. The pattern of attenuation observed - where the introduction of team learning behaviours reduced but did not eliminate the psychological safety effect - is consistent with a shared variance structure in which psychological safety and team learning behaviours overlap empirically while each retaining independent explanatory relevance. It is important to be precise about what this pattern does and does not show. The present cross-sectional design does not permit mediation testing of any kind, partial or otherwise, because mediation requires the establishment of causal directionality, which correlational data cannot provide [17], [18]. The attenuation of the psychological safety coefficient when team learning behaviours are added to the model indicates shared variance between the two predictors, not a mediational pathway. What the data do support is the observation that psychological safety and team learning behaviours are empirically distinguishable contributors to perceived effectiveness, and that their overlap is substantive but not complete. Within the IMOI framework, this pattern is theoretically coherent: psychological safety as an emergent state and learning behaviours as a team process would be expected to co-vary and to jointly shape outcomes. Whether psychological safety exerts its influence partly through the activation of learning behaviours - as a full mediation model would propose - or whether both constructs operate as relatively independent pathways to effectiveness, is an empirically open question that the present data cannot resolve. This constitutes a theoretically motivated agenda for future longitudinal or experimental research, which would enable formal path-analytic testing of the directional relationships among these constructs.

Accountability as a Structural Reinforcer

Accountability was positively and significantly associated with perceived team effectiveness ($\beta = .13$, $p = .002$), consistent with theoretical accounts proposing that perceived responsibility norms activate motivational processes that heighten effort and goal commitment [12], [11], [13]. The smaller effect size relative to role clarity and psychological safety suggests accountability operates alongside, rather than independently of, these broader structural and interpersonal conditions. This finding is consistent with Frink and Klimoski's observation that accountability effects are moderated by the broader social and structural context in which they are enacted [11]. It cautions against implementing accountability mechanisms in isolation, particularly in teams already experiencing limited psychological safety, where punitive accountability norms may undermine interpersonal trust and suppress the open communication that effectiveness requires.

Implications of the Constrained-Functioning Context

The descriptive findings (all construct means below the scale midpoint) highlight a sample characterised by systematically limited team functioning. This contextual feature is both a limitation and a distinctive contribution. The presence of statistically significant associations in a restricted-range sample is notable, as range restriction typically attenuates correlation magnitudes [15]. The modest but consistent effect sizes observed (η^2p = .016-.037; β = .12-.27) should therefore be interpreted as conservative lower-bound estimates of the true population associations rather than as indicators of weak or theoretically trivial effects. In higher-functioning samples with fuller variance, effect sizes of this magnitude would be expected to increase. The consistency of significant effects across three independent analytic methods: ANOVA, hierarchical regression, and ANCOVA, further supports the reliability of these associations despite the constrained variance context. More importantly, the findings demonstrate that structural clarity, interpersonal safety, and accountability norms retain meaningful associations with effectiveness perceptions even in constrained performance contexts, a finding not readily generalisable from research conducted in high-performing samples.

Theoretical Contribution

A note on the operationalisation of the outcome variable is warranted here. Perceived team effectiveness: that is, team members' subjective assessments of whether their team achieves its goals and coordinates its tasks, is the outcome of interest in this study. This operationalisation is theoretically grounded: Hackman explicitly includes member-perceived fulfilment of performance objectives as a criterion of team effectiveness, and Mathieu *et al.* treat perceptual effectiveness ratings as a legitimate and commonly used indicator in survey-based team research [1], [2]. Perceived effectiveness is particularly appropriate in constrained-functioning samples, where objective performance data are rarely accessible and where member perception of functioning is itself a meaningful organisational outcome, shaping motivation, retention intentions, and willingness to invest in team processes. That said, perceived effectiveness shares method variance with the predictor variables, as all measures derive from the same respondents at the same time point. It cannot be assumed to be equivalent to supervisor-rated or objectively measured team output. The present findings should therefore be read as evidence of how structural and interpersonal conditions are associated with how teams perceive their own performance; a meaningful and consequential outcome in its own right, rather than as direct evidence of objective team productivity. Future research employing multi-source effectiveness criteria will be necessary to establish whether the present associations hold when effectiveness is operationalised independently of the predictors. This study makes three contributions to team effectiveness research. First, it demonstrates the concurrent unique explanatory contributions of structural inputs (role clarity, accountability) and an emergent state (psychological safety) using hierarchical regression in a single large cross-sector sample, a methodological approach that prior studies in this space have not consistently employed. Second, it extends IMOI-informed research to constrained-functioning team contexts, providing evidence that the framework's core propositions hold under non-optimal conditions. Third, it empirically

disentangles the contributions of psychological safety and team learning behaviours to perceived effectiveness, demonstrating partial overlap and independent explanatory relevance for both constructs.

Practical Implications

The findings carry several implications for organisational practice, differentiated here by sector given the multi-sector composition of the sample.

In healthcare settings (where role ambiguity has been linked to patient safety risks [19], the primacy of role clarity suggests that structured onboarding, explicit task allocation, and regular role review processes may yield the greatest gains in team effectiveness perceptions. In manufacturing contexts, where accountability norms are often formally embedded in performance management systems, the findings suggest that accountability alone is insufficient; organisations should invest concurrently in interpersonal climate conditions that support open communication. In service sector teams, where psychological safety may be particularly relevant to customer-facing performance, leaders should model constructive responses to mistakes and actively create norms supporting dialogue and idea sharing.

Across all sectors, the overlap between psychological safety and learning behaviours suggests that structured learning routines (such as regular after-action reviews, peer feedback sessions, and systematic knowledge-sharing practices) may serve as a practical mechanism for cultivating both interpersonal climate and behavioural process simultaneously. Given the relatively low levels of functioning observed across the sample, interventions targeted at teams experiencing clarity deficits or limited safety may yield greater returns than those focused on already high-performing teams. In terms of specific intervention modalities, the present findings point to three practical approaches. First, role mapping workshops, in which team members collaboratively document responsibilities, interdependencies, and performance expectations, offer a structured mechanism for building role clarity and reducing ambiguity. Such workshops are low-cost, adaptable across sectors, and directly address the structural input that demonstrated the strongest association with perceived effectiveness in this study. Second, psychological safety can be cultivated through targeted micro-behaviours on the part of team leaders, including publicly acknowledging their own mistakes, inviting dissenting views in meetings, and responding to errors with curiosity rather than blame. These behaviours signal interpersonal safety at the climate level and do not require formal training programmes to implement. Third, accountability can be embedded through structured rituals such as brief weekly commitment check-ins, shared goal tracking, and team-level performance conversations that distinguish between individual accountability and punitive blame. When accountability norms are established alongside psychological safety rather than in opposition to it, the risk of interpersonal trust erosion is substantially reduced. Organisations operating in the constrained-functioning contexts represented in this sample may find the greatest leverage in sequencing these interventions, beginning with role clarity as the structural foundation before layering interpersonal climate and accountability interventions.

Overall, the findings demonstrate that structural clarity, interpersonal safety, and accountability norms each contribute uniquely to perceived team effectiveness, even under constrained performance conditions. These results extend IMOI theory by highlighting the relative influence of structural and psychological inputs in teams operating below optimal levels of functioning, a context that is common in practice but underrepresented in the empirical literature. Future research should examine these relationships longitudinally and incorporate multi-source data to strengthen causal inference. Taken together, the study provides a theoretically grounded and practically relevant foundation for improving team functioning in real-world organisational settings.

Limitations

Several limitations should be considered. First, the cross-sectional design precludes causal inference; directionality of the observed associations cannot be established. This is particularly relevant to the psychological safety and team learning behaviours finding, where the pattern of coefficient attenuation is consistent with a shared variance structure and is theoretically interpretable within a mediation framework, but cannot be taken as evidence of mediation without longitudinal or experimental data establishing causal directionality. Future research employing such designs would enable formal path-analytic mediation testing and provide stronger evidence regarding temporal ordering among these constructs. Second, all variables were measured via self-report at a single time point, introducing the risk of common method variance [20]. Several procedural safeguards were employed to mitigate this risk during data collection. Anonymity was assured to reduce social desirability responding; participants were reminded that there were no right or wrong answers; and predictor and criterion items were separated within the questionnaire to reduce item proximity effects. To assess the statistical magnitude of CMV post hoc, Harman's single-factor test was conducted by submitting all items to an exploratory factor analysis and examining the variance explained by a single unrotated factor. The first factor accounted for 24.3% of total variance, well below the threshold of 50% typically used as a conservative indicator of substantial common method bias. Whilst Harman's test is not a definitive remedy, this result provides modest reassurance that CMV is unlikely to fully account for the observed associations. Future research should nonetheless incorporate multi-source data (such as supervisor effectiveness ratings or objective performance indicators) to further reduce this threat. Third, the cross-sectional design and United Kingdom-based sample limit temporal and cross-cultural generalisability. The UK context carries particular characteristics, including employment legislation, workplace culture norms, and sector-level regulatory frameworks, that may not translate directly to other national contexts. Replication in diverse national and organisational settings would strengthen confidence in the broader robustness of these findings. Some reassurance regarding within-sample consistency is provided by the broadly comparable response rates across sectors (healthcare 81%, service 76%, manufacturing 77%) and the near-equal sector representation in the achieved sample (34.9%, 33.1%, 32.0% respectively), which reduces the risk that findings reflect a single

sector's idiosyncratic characteristics. Nevertheless, the three sectors examined do not exhaust the range of organisational contexts in which constrained-functioning teams operate, and caution is warranted in extending these findings to, for example, public sector, education, or technology-based team environments. Fourth, the absence of confirmatory factor analysis and formal AVE-based discriminant validity evidence represents a limitation of the present study. As this study tests predictive relationships between established constructs rather than introducing new scales or estimating a latent structural model, CFA was not a methodological requirement of the design. However, future work employing SEM or scale validation designs should incorporate formal CFA with Fornell-Larcker criterion testing to provide structural validity evidence. Fifth, the outcome variable in this study is perceived team effectiveness, that is, team members' subjective assessments of their team's performance, rather than objective performance indicators, supervisor-rated effectiveness, or organisational outcome data. Whilst perceived effectiveness is a well-established and theoretically meaningful operationalisation [1], [2], it shares method variance with the predictor variables and may be susceptible to halo effects, particularly in constrained-functioning samples where generalised negative affect could inflate associations among self-report variables. Future research should examine whether the present pattern of findings replicates when effectiveness is operationalised using multi-source ratings or objective performance criteria. Sixth, the observed effect sizes were small (β = .11-.27; η^2p = .016-.037). Small effects are normative in team effectiveness research: Mathieu *et al.*'s comprehensive review of the team effectiveness literature documented that the majority of predictor-outcome associations in this domain fall in the small-to-moderate range [2], reflecting the multidetermined nature of team performance outcomes. The present effect sizes are therefore consistent with the broader literature rather than anomalous. They should additionally be interpreted in the context of the restricted-range sample: as all construct means fell below the scale midpoint, variance in the predictor and outcome variables was constrained relative to what would be expected in a representative population sample. Range restriction systematically attenuates observed correlation and regression coefficients [15], meaning that the reported effect sizes are likely to represent conservative lower-bound estimates of the true population associations. The convergence of statistically significant findings across ANOVA, hierarchical regression, and ANCOVA provides additional confidence that these associations are reliable rather than artefactual. Future research in higher-functioning samples would enable a direct comparison of effect size magnitudes, and the inclusion of additional predictors such as leadership behaviours, task interdependence, and organisational climate would support a more comprehensive explanatory model. Seventh, data were collected at the individual level and analysed accordingly, without formal aggregation to the team level. The cross-organisational sampling design precluded identification of intact team membership and thus the computation of within-group agreement statistics (rwg) or intraclass correlations (ICC) that would be required to justify team-level aggregation. Constructs theorised as team-level phenomena, including psychological safety, role clarity, and accountability,

were therefore operationalised as individual perceptions of team conditions. This is not without precedent: Edmondson originally measured psychological safety at the individual level and aggregated only where within-group agreement justified doing so [5], suggesting that individual-level operationalisation is consistent with the foundational literature on this construct. Future research with access to intact team rosters should examine whether the present findings replicate at the formally aggregated team level.

CONCLUSION

Fundamental Finding : This study examined the concurrent associations between role clarity, psychological safety, accountability, team learning behaviours, and perceived team effectiveness in a large cross-sector sample of 690 employees. Using ANOVA, hierarchical regression, and ANCOVA, the findings demonstrate that role clarity, psychological safety, and accountability each uniquely predict perceived team effectiveness, together accounting for 22% of variance. The addition of team learning behaviours explained a significant additional 3% of variance. Psychological safety retained a significant association with effectiveness after controlling for learning behaviours, though its effect size was attenuated, indicating partial empirical overlap between these constructs. The study's primary contribution lies not in identifying new constructs but in demonstrating that established structural and interpersonal conditions retain meaningful and differential explanatory relevance specifically within constrained-functioning team contexts, a population that is common in practice but systematically underrepresented in the empirical literature. **Implication :** Organisations that assume team effectiveness frameworks only apply once basic functioning thresholds have been met may be misallocating developmental resources. The present findings suggest otherwise: that role clarity, psychological safety, and accountability each operate as meaningful levers for perceived effectiveness even when all three are in short supply. **Limitation :** The study is limited by its cross-sectional, self-report design, and future research should adopt longitudinal and multi-method approaches. **Future Research :** Future research should employ longitudinal designs and multi-source measurement to clarify causal ordering and should incorporate confirmatory factor analysis to establish formal construct validity prior to regression-based inference. Cross-cultural replication across sectors beyond healthcare, service, and manufacturing would further extend the generalisability of these findings.

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*__Rani OKHOMINA (Corresponding Author)__
Independent Organisational Psychology Researcher, United Kingdom