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Self-Determination Theory in Ghanaian Sport: Coaching Autonomy Support Predicts Team Climate via Motivation

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ABSTRACT

Background: The study seeks to bridge a gap and test whether autonomous motivation acts as a mediator of the relationship between coaching autonomy support and team climate perceptions in Ghanaian sport.

Methods: One hundred and thirteen student-athletes (average age 21.4 years, 42% female) in university sport teams filled out questionnaires for assessing the coaches' autonomy support to their athletes, autonomous motivation, controlled motivation, and the climate of their team. A confirmatory factor analysis was conducted to verify the theoretical structure of the measurement model. A structural equation model was developed to analyse direct and indirect effects using the statistical procedure in the weighted least squares with mean variance adjustment estimation and bootstrapping mediation analysis (2,000 resamples).

Results: Coaching autonomy support significantly predicted autonomous motivation ($\beta = .94$, $p < .001$, $R^2 = .619$). Autonomous motivation significantly predicted team climate ($\beta = 0.26$, $p = .03$). The indirect path from coaching autonomy support to team climate was significant (indirect effect = 0.24; 95% CI: 0.017–0.488), providing evidence of mediation. Controlled motivation was unrelated to team climate ($\beta = –0.01$, $p = .91$). The structural model accounted for 74% of the variance in team climate (RMSEA = .066; CFI = .998).

Conclusion: Coaching autonomy support operates as a distal predictor of team climate through autonomous motivation. Autonomy-supportive coaching interventions represent high-impact leverage points for enhancing individual motivation and collective team functioning in university sport contexts.

Keywords: Psychological need satisfaction, athlete engagement, wellbeing, motivational pathways, sports coaching behaviour

1. INTRODUCTION

Research in contemporary sport psychology is beginning to show that athletic performance and wellbeing are influenced by the interaction of coach behaviours, athlete motivation, and team environmental factors (Jauvin et al., 2025). Self-Determination Theory (SDT) has emerged as a central framework for examining how coaching environments impact athlete motivation through the satisfaction of the three basic psychological needs identified within SDT: autonomy, competence, and relatedness (Ryan & Deci, 2022). Research also reinforces the idea that when coaches practice need-supportive behaviours, such as providing meaningful choices, giving responsive feedback, and being genuinely supportive in their interpersonal interactions with their athletes, they create a setting

where their athletes experience a significant increase in autonomous motivation, which leads to strengthened motivation, better athletic performance, and overall greater psychological wellbeing (Hollembeak & Amorose, 2005).

Coach-athlete relationship quality is viewed as the main factor for determining team performance and climate. Studies utilising the 3+1 Cs model have shown to enhance team climate and improve team performance when coaches develop strong relationships with their athletes. These studies have also demonstrated that a positive team climate can be established through a coach's ability to build trust, communicate effectively, and foster an environment where all members feel collectively efficacious (Hampson & Jowett, 2012). Longitudinal research on youth sports have found that both task-involving motivational climates and self-determined motivation are predictive of sustained enjoyment and continued participation in sports, and the two factors interact to produce some of the benefits associated with enjoying physical activity (Amaro et al., 2023). Despite the many research findings supporting the notion that coaching support enhances team performance, there are still many gaps in the literature that address how coaching support results in enhanced team performance; specifically, the role of mediation by various motivational forms (Fontannaz, 2019).

Although there is an abundance of theoretical backing and mounting amounts of empirical data supporting SDT within the sport environment, there are significant voids in the current literature that need to be addressed. The first area of concern stems from the fact that many researchers have studied the relationships between coaching support and autonomous motivation (Ensrud-Skraastad & Haga, 2020), but very few researchers have concurrently investigated if both autonomous and controlled motivation act as separate mediation paths linking coaching support and team level outcome(s) through modern structural equation modelling (SEM) methods (Albejaidi, 2021). The second gap exists because all prior research used cross sectional methodologies which limit the ability to conduct rigorous causal inference as to how coaching behaviours impact team climate through motivational mediators (Wooldridge, 2023). The third gap exists since all prior investigations failed to account for an important distinction: autonomous motivation can significantly mediate the relationship between coaching and team climate, while controlled motivation will either be unrelated or negative towards collective performance (Woodruff, 2023).

A key limitation to date has been the lack of studies using integrative models that test both direct, indirect, and conditional pathways simultaneously (Barlett, 2010). Patterns of psychological need satisfaction vary significantly among the contexts of individual sports and team sports. To date, no prior research has studied the extent to which coaching support influences team climate for all types of motivational needs or if autonomous and controlled motivation are qualitatively different mechanisms (Van Yperen, 2025). Most recently, meta-analytic evidence from contemporary studies (Brydges & Gaeta, 2019) indicate that basic psychological need support relates to autonomous motivation, however, the structural model based on how this translates into team climate and collective functioning remains poorly defined (Gaston, 1980). To develop evidence-based coaching education programmes to promote not only the individual motivation of athletes but also the collective processes of teams, it will be critical to understand these mediation processes (Egemen Merdan & Çağlar, 2025).

Despite growing empirical support for Self-Determination Theory in sport contexts, important gaps remain in understanding how coaching autonomy support translates into team-level outcomes through distinct motivational pathways. The researchers are addressing this area of need by using confirmatory factor analysis and structural equation modelling to assess an integrated conceptual model. This model is assessing the extent to which coaching support impacts team climate through both autonomous and controlled motivation paths (directly and indirectly). Using data from 113 student athletes competing in multiple team sports, the researchers conducted rigorous confirmatory factor analysis to establish the measurement structure. The researchers then used the lavaan package for R to test the directionality of all proposed direct and indirect relationships. In addition, the researchers utilised bootstrap resampling (N = 2,000) to provide confidence intervals for the indirect effects and to increase the statistical reliability of their results.

The research's unique contribution to knowledge is multi-faceted. Firstly, it provides empirical data on whether there is a mediation effect of autonomous motivation in the relationship between coaching support–team climate based upon SDT theory that suggests both intrinsic and self-determined forms of extrinsic motivation are positively related to interpersonal and collective level outcomes. Secondly, this study quantitatively measures the comparative effectiveness of controlled motivation as an

indicator of team climate, thereby evaluating whether coaching methods using external rewards or the potential threat of ego-based competition commonly used in competitive sport environments can produce positive team level outcomes. Lastly, using SEM, the study illustrates how these motivational factors function simultaneously; providing an alternative to the methodological and statistical shortcomings associated with sequential regression methods which cannot adequately account for the errors associated with measuring latent variables or estimate indirect effects with adequate confidence intervals.

The purpose of this study was to examine whether autonomous motivation mediates the relationship between coaching autonomy support and team climate perceptions among Ghanaian university athletes, while also evaluating controlled motivation as a parallel motivational pathway. Specifically, it was hypothesised that coaching autonomy support would be positively associated with autonomous motivation, autonomous motivation would be positively associated with team climate perceptions, autonomous motivation would mediate the relationship between coaching autonomy support and team climate, and controlled motivation would not be significantly associated with team climate perceptions.

2. METHODS

2.1. Study design and ethical procedures

The study used a cross-sectional, correlational methodology to examine how coaching support affected athlete motivation and subsequently influenced team climate outcomes (Mohd Kassim & Boardley, 2018). This study followed the ethical guidelines set forth by the American Psychological Association for conducting research as outlined in their Ethical Principles of Psychologists and Code of Conduct. Prior to collecting the data, Institutional Review Board (IRB) approval was granted in accordance with the Declaration of Helsinki. Participants were required to provide written informed consent to participate in the study. The collection of data was conducted with consideration of human rights (i.e. confidentiality and voluntary participation).

2.2. Participants and sampling

Participants consisted of 113 student-athletes from university-based team sports (mean age = 21.4 years, SD = 1.8; 42% female; 58% male) recruited from five team sports (soccer, n = 34; volleyball, n = 28; basketball, n = 26; lacrosse, n = 15; field hockey, n = 10). Inclusion criteria required participants to be enrolled as student-athletes, 18 years old or older, to have competed on a university or club-level sports team for at least one academic year, and provided written informed consent. Participants were recruited during team meetings and on-campus athletic events using convenience sampling methods (Etikan, 2016). A convenience sampling approach was adopted due to practical constraints related to access to intact university sports teams and the scheduling demands of competitive training and competition periods. This strategy is common in sport psychology research examining naturally occurring team environments, particularly when structural equation modelling is used for theory testing rather than population estimation. Although this sampling approach limits generalisability, it is appropriate for examining theoretically grounded relational models within applied sport settings.

2.3. Measures

Coaching Autonomy Support – Six items were used to measure coaching autonomy support. These items are based on athlete-centred coaching scales by Grant (2014), developed through the Self-Determination Theory. The items were statements such as: "I am given choices by my coach for how to practice." and "My coach listens to what I have to say about training.", etc. Each item was assessed using a five-point Likert-type scale, ranging from (1) *strongly disagree* to (5) *strongly agree*. The internal reliability for this sub-scale was high, with a Cronbach's alpha value of .87.

Team Climate – Athlete views on team environment were evaluated with the use of nine questions that measured the team level of (1) perceived interpersonal support, (2) how important it was to be good at tasks, and (3) team belief in their ability to accomplish their goals (Paulin & Griffin, 2015). The questions were rated on a five-point Likert scale and included examples like, "Team members help each other get better.", "There is a high amount of unity among team members.", and "Our coach promotes openness inside the team." Cronbach's α for this subscale was 0.92, which is an indicator of high reliability.

Autonomous Motivation – The four-item autonomous motivation scale assessed both intrinsic and self-determined forms of extrinsic motivation to establish the level of autonomous motivation as defined by Sansone & Tang (2021) for example, "I play sports because I enjoy learning new skills." and "I train hard because I find sport personally rewarding." The response format consisted of a five-point

Likert scale and demonstrated an extremely high degree of internal consistency (Cronbach's $\alpha = 0.91$).

Controlled Motivation – Internal and external motivation were measured with a four-item scale that assessed both the external regulation and the introjected regulation of controlled motivation (Vlachopoulos & Karageorghis, 2007). Examples of items are as follows: "I participate in training because other people expect it from me.", "I continue to train because I would be embarrassed to stop now." The reliability of the controlled motivation items was measured by Cronbach's alpha, which equalled 0.74, indicating a sufficient level of internal reliability.

All measurement scales utilised ordered categorical response options (Likert-type, five points) with no missing data, with response rates exceeding 99%.

2.4. Statistical analysis

An implementation of a two-stage structural equation modelling (SEM) approach used the lavaan package (version 0.6-21), within the R statistical software (version 4.5.0) (Rosseel, 2012). Confirmatory factor analysis (CFA) was utilised to validate the measurement model and test the convergent and discriminant validity of all measurement items (Sureshchandar, 2021). Preliminary data screening indicated acceptable levels of skewness and kurtosis for all observed variables (absolute skewness <2 and kurtosis <7), supporting the suitability of the data for latent variable modelling. Given the ordinal nature of the Likert-type response scales and the potential for deviations from multivariate normality, the weighted least squares mean and variance adjusted (WLSMV) estimator was used, as it provides robust parameter estimates under non-normal conditions. Four latent constructs were included in the CFA, including coaching autonomy support; team climate, autonomous motivation, and controlled motivation. Each of these constructs had corresponding measured variable indicators. As the data are based upon ordered categorical responses, an appropriate CFA technique was used (due to its ability to utilise weighted least squares with mean and variance adjustment, WLSMV estimation), which is suggested by Gazeloglu & Aşan Greenacre (2020), as it allows for the generation of reliable parameter estimates and fit index values.

The structural model fit and measurement models were assessed based upon a variety of fit indexes as is currently recommended by Draxler & Kurz (2024) and Koran (2025). Measurement invariance across gender (n = 64 males vs. n = 49 females) and sport type (soccer/volleyball/basketball vs. lacrosse/field hockey) was tested using multi-group confirmatory factor analysis. The configural invariance model demonstrated good fit (CFI = .992, RMSEA = .068), and metric invariance was supported by nonsignificant declines in fit (ΔCFI = .004 < .01). These results confirm the comparability of constructs across subgroups. In order to determine if the model fit well, we assessed CFI and TLI fit indexes at or greater than .95 (which indicate excellent fit) as well as RMSEA values less than .05 (indicating excellent fit) and SRMR values less than .08 (indicating acceptable fit with 90% confidence interval provided). We used these metrics to assess our SEM models since they are current best practices for assessing fit of an SEM model; furthermore, they do not rely upon sample size assumptions which can affect the Chi-Squared statistic (Molwus et al., 2013).

After validating the structural model, it was fit to estimate direct relationships from coaching autonomy support to both autonomous motivation and controlled motivation as well as from each type of motivation to team climate (Liu, 2025). The primary purpose of this model was to examine whether the influence that coaching support has on team climate is mediated by the motivational pathways (i.e. autonomous motivation, controlled motivation). To assess mediation or indirect effects (mediation), percentile bootstrap confidence intervals were calculated for each indirect effect based on 2,000 resamples of the data (Hosseini-Nasab & Vakili, 2013). A statistically significant indirect effect existed when the 95% bias corrected confidence interval around the indirect effect did not include zero. The path coefficients in the structural equation model were standardised so that the magnitude of each pathway could be compared (Yang, 2023). All analyses utilised a two-tailed test, where the alpha was set to .05.

3. RESULTS

3.1. Measurement model results

To assess the construct validity and reliability of the measurement model (Sureshchandar, 2021), confirmatory factor analysis was performed on the measurement model. In the CFA model, there were four latent factors (team climate, coaching autonomy support, autonomous motivation, and controlled motivation) and 23 observed indicators in the measurement model. The results of the measurement

model indicated an acceptable fit to the data: $\chi^2(224) = 312.738$, $p < .001$; all of the other model fit indexes exceeded the recommended criteria for a good fitting model: CFI = 0.999, TLI = 0.998, RMSEA = 0.059 with a 90% CI (confidence interval) of [0.043, 0.075]; SRMR = 0.067. All the model fit indexes indicated that the measurement model fits the data well. The CFI and TLI are significantly greater than the 0.95 threshold; the RMSEA is less than the 0.08 criterion; and the SRMR is less than the 0.10 criterion.

Coaching autonomy support had factor loadings that ranged from .55 to .91 standardised; as such, all were above .5 and thus demonstrated evidence of convergent validity. The team climate items showed elevated levels of factor loading (.89 to .95) which demonstrated a precise measurement. All items measuring autonomous motivation displayed high and consistent loadings with all being over .92 standardised, in addition to demonstrating high consistency across items, all loadings were significant (all $p < .001$) and ranged from .92 to .95, suggesting a very consistent measurement of the autonomous motivation construct. Loadings measuring controlled motivation were less consistent with a range of .39 to .90 standardised; however, all were statistically significant (all $p < .001$).

Table 1. **Factor loadings, standard errors, and construct reliabilities for the measurement model**

Construct	Item	Standardised Loading (λ)	Standard Error	*z*-value	*p*-value	Cronbach's α	Composite Reliability (ω)
Coaching Autonomy Support						0.87	0.87
	I feel free to express my opinions	0.765	–	–	–		
	My coach gives me choices	0.551	0.090	7.979	<.001		
	My coach listens to my perspectives	0.803	0.063	16.551	<.001		
	My coach encourages my decisions	0.790	0.065	15.917	<.001		
	My coach encourages communication	0.905	0.071	16.621	<.001		
	My coach treats all players fairly	0.881	0.062	18.496	<.001		
Team Climate						0.97	0.89
	I feel supported by my teammates	0.891	–	–	–		

Construct	Item	Standardised Loading (λ)	Standard Error	*z*-value	*p*-value	Cronbach's α	Composite Reliability (ω)
	I feel close to my teammates	0.911	0.029	35.670	<.001		
	I am treated with respect	0.952	0.028	38.687	<.001		
	Team members help each other	0.949	0.027	39.195	<.001		
	I feel a strong sense of unity	0.938	0.028	36.984	<.001		
	Team members respect opinions	0.924	0.026	39.595	<.001		
	Conflicts are resolved fairly	0.936	0.025	42.025	<.001		
	Successes are celebrated	0.930	0.027	37.983	<.001		
	I feel a strong sense of belonging	0.920	0.026	39.113	<.001		
Autonomous Motivation						0.95	0.92
	Practice for enjoyment	0.946	–	–	–		
	Train for personal satisfaction	0.946	0.035	28.257	<.001		
	Practice for competition excitement	0.921	0.033	29.830	<.001		
	Continue for personal value	0.946	0.037	27.272	<.001		
Controlled Motivation						0.68	0.54

Construct	Item	Standardised Loading (λ)	Standard Error	*z*-value	*p*-value	Cronbach's α	Composite Reliability (ω)
	Others expect participation	0.415	–	–	–		
	Important for self-image	0.901	0.477	4.555	<.001		
	Avoid letting teammates down	0.782	0.371	5.079	<.001		
	Avoid shame if quit	0.391	0.209	4.521	<.001		

Note: All items were measured on the 1–5 Likert scale. Cronbach's α and composite reliability (ω) values ≥0.70 indicate adequate internal consistency. All loadings $p < .05$; all z-values significant at $p < .001$, except where indicated.

Strong composite reliability estimates were found in the reliability of the latent variables assessed within the study. Cronbach's alpha was .87 for the coaching autonomy to support latent variables, which is indicative of high reliability. The team climate latent variable exhibited exceptional internal consistency using Cronbach's alpha (.97). The autonomous motivation latent variable also showed an extremely elevated level of internal consistency (Cronbach's alpha = .95). A Cronbach's alpha value of .68 was obtained for controlled motivation; which is just under the .70 threshold that represents acceptable to good internal consistency for a given measure. Additionally, ω composite reliability coefficients were computed for each of the four latent variables: coaching autonomy support (ω = .87), team climate (ω = .89), autonomous motivation (ω = .92), and controlled motivation (ω = .54). Composite reliability coefficient values above .70 are indicative of acceptable construct reliability; however, controlled motivation did not achieve this criterion, and thus its indicators are quite heterogenous.

Table 2. **Latent variable correlations and covariances from the measurement model**

Construct Pairs	Covariance	Correlation (*r*)	Standard Error	*z*-value	*p*-value
Coaching Support ↔ Team Climate	0.655	0.96	0.050	13.127	<.001
Coaching Support ↔ Autonomous Motivation	0.647	0.89	0.051	12.766	<.001
Coaching Support ↔ Controlled Motivation	0.247	0.78	0.059	4.183	<.001

Construct Pairs	Covariance	Correlation (*r*)	Standard Error	*z*-value	*p*-value
Team Climate ↔ Autonomous Motivation	0.709	0.84	0.050	14.306	<.001
Team Climate ↔ Controlled Motivation	0.273	0.74	0.066	4.119	<.001
Autonomous ↔ Controlled Motivation	0.349	0.89	0.078	4.488	<.001

Note: All correlations significant at $p < .001$. Correlations in the 0.70–0.96 range indicate substantial interdependence among constructs. Data extracted from CFA measurement model ($\chi^2 = 312.738$, CFI = 0.999, TLI = 0.998, RMSEA = 0.059).

Coaching autonomy support was significantly associated with autonomous motivation ($r = 0.89$; $p < .001$), demonstrating that autonomy-supportive coaching is consistently associated with autonomous motivation (Huang, 2023). Coaching autonomy support had a significant association to team climate ($r = 0.96$; $p < .001$) which indicates that autonomy-supportive coaching occurs in conjunction with positive team climate perceptions (Kim & Park, 2025). There was a moderate positive relationship between coaching autonomy support and controlled motivation ($r = 0.78$; $p < .001$) indicating autonomy-supportive coaches utilise some external reinforcement methods but to a lesser degree (Su et al., 2024). There was a moderate positive relationship between autonomous and controlled motivation ($r = 0.89$; $p < .001$), as expected based on the Self-Determination Theory's predictions of the two separate forms of motivation being able to occur simultaneously.

3.2. Structural model pathways

In addition to exploring how autonomy support given by coaches influences autonomous and controlled motivation, the structural model looked at how autonomous and controlled motivation influenced team climate as well. Autonomous motivation was found to be strongly influenced by autonomy support provided by the coach ($p < .001$) and its standardised path coefficient was large ($\beta = 0.94$, SE = 0.07, 95% CI: 0.75–1.10; $R^2 = .619$) which explained 61.9% of the variation ($R^2 = .619$) in autonomous motivation. In terms of conventionally accepted levels of strength for relationships, this result demonstrates that coaching autonomy support has a dominant relationship in producing autonomous motivation.

In addition to being a direct predictor of controlled motivation ($\beta = 0.88$, SE = 0.11, $p < .001$, 95% CI: 0.43 – 0.73), coaching autonomy support was a direct predictor of controlled motivation and accounted for 30% of the variance in controlled motivation ($R^2 = 0.30$). Thus, autonomy-supportive coaches place less emphasis on relying on external reinforcement or using pressure tactics as compared with the size of the autonomous motivation pathway.

Team climate was positively influenced by autonomous motivation ($\beta = 0.26$; $p = .03$) and showed a small to moderate relationship. Thus, the results indicate that Self-Determination Theory-based motivational processes (autonomy support from coaches and athletes' intrinsic motivation) contribute to favourable team climates, as perceived by athletes. A total of 74% of the variability in team climate was explained by coaching autonomy support, autonomous motivation, and controlled motivation.

Although controlled motivation had a very small non-significant relationship with team climate ($\beta = -0.01$, SE = 0.07, $p = .911$, 95% CI: −0.14 to 0.12) this relationship was too small to have any statistically significant relationship with team climate suggesting that whether an athlete is driven by internal or external pressure has little effect on the perception they have of the level of support and cohesion of their teammates.

Table 3. **Standardised path coefficients, standard errors, and fit indices for the structural model**

Path	Estimate (β)	Standard Error	*z*-value	*p*-value	95% CI Lower	95% CI Upper	R^2
Direct Effects							
Coaching → Autonomous Motivation	0.941	0.071	16.912	<.001	0.750	1.100	0.619
Coaching → Controlled Motivation	0.883	0.107	4.591	<.001	0.427	0.734	0.298
Autonomous Motivation → Team Climate	0.255	0.117	2.176	.030	0.018	0.485	
Controlled Motivation → Team Climate	−0.008	0.067	−0.112	.911	−0.143	0.124	
Model Fit Indices							
CFA Model	$\chi^2(224) = 312.738$						
	CFI = 0.999; TLI = 0.998						
	RMSEA = 0.059 [0.043–0.075]; SRMR = 0.067						
SEM Model	$\chi^2(225) = 333.118$						
	CFI = 0.998; TLI = 0.998						

Path	Estimate (β)	Standard Error	*z*-value	*p*-value	95% CI Lower	95% CI Upper	R^2
	RMSEA = 0.066 [0.050–0.080]; SRMR = 0.069						
Team Climate R^2							0.74

Note: All statistics are standardised. CFA = confirmatory factor analysis; SEM = structural equation modelling. All direct paths, except for Controlled Motivation → Team Climate, were significant ($p < .05$). CI = confidence interval; R^2 = proportion of variance explained.

3.3. Mediation analysis

Bootstrapped confidence intervals were used for percentiles to estimate indirect effects (the mediating paths). A total of 2,000 bootstrapped samples were taken in order to determine whether there is a statistically significant indirect relationship between coaching autonomy support and team climate via autonomous motivation (indicated by the standardised indirect effect = .24, with a 95% bias-corrected bootstrap confidence interval of (.017–.488)), which suggests that autonomous motivation partially mediates this relationship. Therefore, the indirect path demonstrates a small to moderate mediation effect and shows that coaching autonomy support has a sizeable influence upon team climate through the increase in autonomous motivation that coaching autonomy support can produce.

The indirect effect of coaching autonomy support on team climate via controlled motivation, although statistically insignificant (−0.004) and small in magnitude (95% CI: −0.087 to 0.075), crossed the zero threshold, and therefore did not demonstrate a statistically or practically significant mediation of the relationship between coaching autonomy support and team climate. Thus, the motivation by external factors pathway has minor impact upon the outcome of team climate as Self-Determination Theory predicts that controlled motivation does not contribute positively to team functioning (Luo & Derakhshan, 2024).

The structural model has also shown a good fit to the data based on the structural model's fit statistic. The structural model had $\chi^2(225) = 333.118$, $p < .001$, and CFI = 0.998 and TLI = 0.998. Both CFI and TLI are greater than the 0.95 minimum value for excellent fit. Additionally, the RMSEA = 0.066, with the 90% confidence interval for RMSEA [0.050, 0.080]. This is less than 0.08, and this confirms the model was precise at fitting the data. The SRMR = 0.069 is less than 0.10 and shows that there are very few standardised residuals for this model. The comparison of the measurement-only model (RMSEA = 0.059), and the structural model (RMSEA = 0.066) indicates that there is little or no impact from adding structural paths to the model.

Table 4. **Indirect effects (mediation pathways) with 95% bias-corrected bootstrap confidence intervals**

Indirect Pathway	Indirect Effect	Standard Error	95% CI Lower	95% CI Upper	Significant	Effect Interpretation
Coaching → Autonomous Motivation → Team Climate	0.240	0.118	0.017	0.488	Yes	Small-to-moderate partial mediation
Coaching → Controlled Motivation → Team Climate	−0.004	0.040	−0.087	0.075	No	No meaningful mediation pathway
Total Indirect Effects	0.235	0.114	0.032	0.473	Yes	Cumulative mediation

Note: Bootstrap CI excludes zero = significant mediation ($p < .05$). Data based on 2,000 resampled datasets with bias correction. WLSMV estimation with ordered categorical indicators. CI = confidence interval.

4. DISCUSSION

4.1. Summary of key findings

The main goal of this study was to find out how coaching autonomy support affects collegiate athletes' perceptions of team climate, by using athlete motivation as the most important mediator in this relationship. This study's results were an excellent fit for the structural equation model and empirically validated Self-Determination Theory.

Coaching autonomy support was also found to have an exceptionally strong direct influence on autonomous motivation ($\beta = 0.94$, $p < .001$) and explained 61.9% of the variance ($R^2 = .619$) in self-determined motivation. Autonomous motivation was also found to have a moderate influence on team climate perceptions ($\beta = 0.26$, $p = .030$). Using bootstrap mediation analysis, we could determine if the indirect relationship is statistically significant; it was (indirect effect = 0.24, 95% CI: 0.017–0.488) and accounts for part of the mediation between coaching support and team climate. On the other hand, controlled motivation was found to have no relationship with team climate ($\beta = -0.01$, $p = .911$); therefore, when individuals operate from an externally regulated or pressured state they do not appear to contribute positively to their teams' function. However, alternative interpretations of the non-significant controlled motivation → team climate path merit consideration. In the Ghanaian university sport context, characterised by collectivist cultural norms, external pressures (e.g. "avoid letting teammates down", "others expect participation") may function as normative team obligations rather than psychologically controlling influences that undermine climate perceptions. This differs from Western models where controlled motivation typically shows negative relations with group outcomes. The null finding may thus reflect cultural adaptation of motivation constructs rather than absence of controlled influences. Overall, the final structural model accounted for approximately 74% of the variance in team climate, which is significantly greater than the average effect size typically seen in sport motivation literature and indicates that coaching autonomy support and autonomous motivation represent two potentially highly effective ways of improving the psychological functioning of teams.

4.2. Alignment with self-determination theory

The extremely high correlation between coaching autonomy support and autonomous motivation (.94) is consistent with foundational predictions of Self-Determination Theory (Deci et al., 1999; Deci & Ryan, 2002; Ryan & Deci, 2000) as well as a recently completed meta-analysis (Vergara-Morales & Rodriguez, 2025). Prior research posited that if

coaches are able to assist in the development of athletes' perspective-taking, if they will allow the athletes to make volitional choices for their own actions, if they can provide the athletes with rationale that are meaningful, and if they refrain from controlling behaviour on the part of the athlete, then intrinsic motivation will be fostered. The current study provides the first empirical evidence using structural equation modelling for this previously conceptualised theoretical mechanism (Morinishi et al., 2025).

The larger effect size could be a result of the specific way the measurements were taken; they measured directly observable coaching behaviours and not the overall construct of leadership. The size of the relationship between coaching and motivation indicates that a coach's behaviour is the largest controllable variable on an athlete's motivation in university settings; therefore, coaches are likely to be the most impactful variable when it comes to improving the system.

4.3. Why autonomy matters for team climate

At the individual level, autonomy-supportive coaching addresses the need for individuals to have a choice and be able to direct themselves. Athletes who are provided with autonomy for their athletic involvement experience more 'ownership' of their athletic activities; experience higher levels of intrinsic reward from their training activities; and exhibit higher levels of persistence as they encounter adversity. As individually motivated athletes, they then create changes in team dynamics by engaging in true collaborative behaviours (versus coerced compliance). Individually motivated athletes also provide more effort towards common team goals because they believe in those goals (not because of fear of punishment) and therefore will naturally provide support to teammates which will create a reciprocal relationship (versus hierarchical) among teammates.

The partial mediation of team climate through autonomous motivation extends previous theoretical understanding by demonstrating that coaching influence on collective team perceptions operates through individual athletes' internalised motivation. This mechanism has profound implications for university sport contexts, particularly in environments where traditional hierarchical coaching models may predominate.

4.4. Limitations and boundary conditions

There are several weaknesses in this study. The most important limitation is that because the study was conducted on a one-time basis (cross-sectionally), it is impossible to use the data to draw cause-and-effect inferences about coaching behaviours and athlete motivation. Temporal precedence could be established with longitudinal studies of teams that measure coaching behaviours, athlete motivation, and team climate over time. The second weakness is that the study uses self-reported data, which introduces common-method variance; thus, having an independent observer for coaches or using behavioural coding techniques may provide a stronger conclusion than using only self-reporting. A third limitation is that the sample size used in the study is limited to just one school and therefore provides little generalisable information about schools or institutions from other areas of the country. Lastly, the composite reliability for controlled motivation (ω = .54) is less than adequate to suggest that there may be distinct aspects of controlled motivation. The relatively low composite reliability for controlled motivation (ω = .54; Table 1) merits attention. This may reflect cultural nuances in the Ghanaian university sport context, where external regulation items (e.g. "others expect participation") and introjected regulation items (e.g. "avoid shame if quit") demonstrate conceptual overlap within collectivist team environments. In contrast to Western samples where these motivation forms are more psychologically distinct, Ghanaian athletes may experience these pressures similarly due to strong communal obligations and team interdependence. These findings suggest that controlled motivation items may require cultural adaptation or supplementation with qualitative methods in future non-Western sport psychology research.

Additionally, the structural model showed extremely high latent correlations (coaching autonomy support ↔ team climate r = .96; coaching ↔ autonomous motivation r = .89) and a very strong path coefficient (β = .94, R^2 = .619), raising concerns about potential common method variance from self-report methodology and possible multicollinearity. While Harman's single-factor test explained less than 50% of variance, indicating adequate discriminant validity, these strong relationships suggest conceptual overlap between coaching behaviours and athlete perceptions in team sport contexts. Future studies should employ multi-method approaches to validate these findings. The application of superior methodologies to provide more reliable results is important. WLSMV estimation was used on ordinary data; excellent measurement model fit was

obtained (CFI = .999, RMSEA = .059); and a robust bootstrap mediation approach was used (2,000 resampling CI with bias correction). Also, complete data from all participants removed missing data as an issue. This study provides a very rigorous structural test of SDT mechanisms.

4.5. Practical implications for athletic administration

This result highlights for athletic administrators and coaches the value of coaching education to support an athlete's autonomy. Instead of seeing this type of coaching approach as a "soft" method of coaching or one that would undermine the coach's authority and discipline, these results show that supporting an athlete's autonomy is the best way to create an atmosphere where the athlete will be motivated to participate based on their own internal desire (self-determined motivation) and ultimately, will influence how each athlete experiences their team. Coaches that consistently allow their athletes to make choices that are meaningful but still fit into the established framework, provide opportunities for the athlete to contribute to the decision-making process, provide non-controlling feedback, and, most importantly, genuinely understand the athlete's perspective, are able to develop both the individual intrinsic motivation of the athletes and the team cohesion of all involved.

The size of the coaching-to-motivation effect indicates that coaches are the most impactful controllable factor influencing athlete motivation in university settings; therefore, coaches have the greatest potential to create positive systemic change. The investment of time, resources, and money into the development of coaching education programmes that provide coaches with skills and knowledge on how to be supportive of autonomy support represent high impact opportunities to positively improve team dynamics and athlete wellbeing.

4.6. Future research directions

Longitudinal studies that measure coaching behaviour (coaching), athlete motivation (motivation), and team climate (climate) in the same group of participants over multiple competitive seasons can allow researchers to establish causal relationships between coaching behaviours and the other variables. Additionally, randomised controlled trials of coaching interventions that are designed to be autonomy-supportive would represent the most rigorous research design to determine if there is a causal relationship between an autonomy-supportive coaching intervention and positive changes in athlete motivation and/or team climate. Finally, a multi-level analysis of the effect of coaching on athlete motivation and/or team climate with each level representing coaching at distinct levels (i.e. individual coaches, teams, and/or institutions) will assist in establishing whether the findings from this research can be generalised to other populations and contexts. In addition to the quantitative data collected during longitudinal studies, qualitative studies that examine how athletes who are autonomously motivated perceive their own contribution to team climate, as well as how they influence others, will help to understand how the mechanisms of autonomous motivation affect team climate.

5. CONCLUSIONS

The current study clearly shows that coaching autonomy support is a strong upstream predictor of team climate and that it impacts autonomous motivation in athletes. When coaches support their athletes' autonomy, the athletes develop self-determination, which causes them to create an environment for their teammates that is psychologically supportive and cohesive, establishing a positive team climate. The large effect size of coaching autonomy support provides athletic directors with a method for building a stronger team culture and improving the wellbeing of athletes, providing a theoretical foundation and empirical basis for future interventions. Future studies can expand upon this research by conducting longitudinal and experimental designs, while athletic practitioners can consider adapting their coaching education into local cultural norms, while also keeping the autonomy-supporting aspects of the education true to themselves.

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