

The Regulation Effect of Team Leadership and Cohesion on Athletes' Sports Grade

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Abstract

Team cohesion is a crucial element in bringing the group together. Team cohesion is the engine that drives the progression of a sports team, and it plays a crucial part in boosting the team's confidence and overall performance. This study aims to investigate the connection between athlete leadership and team cohesion and the potential mediating and regulating effects between emotional infection and sports grade. The Athlete Leadership Questionnaire, Group Environment Questionnaire, and Emotional Infection Scale were administered to 316 athletes, and the data were analyzed using SPSS. The Bootstrap approach was used to determine whether emotional infection significantly mediated the link between athlete conduct and team cohesion. In the main effect, athlete leadership can positively and significantly predict team cohesion ($\beta=0.531$, $p<0.01$), and the interaction item between athlete's leadership and sports level also reached a significant level ($\beta=0.355$, $p<0.01$). Age and sex did not pass the F test ($F=1.148$, $p>0.05$), indicating that they will not affect group cohesion. This study found that team cohesiveness and external leaders had the most impact on social cohesion, but social leaders had the greatest impact on task cohesion. In addition, the study found that emotional infection serves as a partial mediator between the leadership of athletes and their numerous aspects and team cohesion.

Keywords: Team cohesion; Athlete leadership; Emotional infection; Sports level; Mediation effect; Regulatory effect

1. Introduction

Exercise is a physical activity that combines physical power and skill and is controlled by a system of rules or habits; social activities that combine natural components such as sunlight, air, water, and sanitary measures, use physical exercise as the fundamental means (Kim, Do Kim, & Lee, 2020). It seeks to strengthen the body, improve physical and mental health, and increase social adaptation. Numerous outstanding teams have evolved in modern team sports (Pierce, Erickson, & Sarkar, 2020). Whether it is the American men's basketball team nicknamed "Dream Team" by fans around the world or the Real Madrid football team nicknamed "Galaxy Battleship," the effective leadership (informal leadership) of excellent team members can have a significant positive impact on the performance of the entire team. The successful leadership of outstanding (core) players significantly influences sports teams (Takamatsu & Yamakita, 2022).

Emotional infection, the process of transmitting emotions from one individual to another, significantly influences individual and team performance (Corti et al., 2023). Team cohesion is one of the most important psychological aspects of a group. In its recently issued "Thirteenth Five-Year Strategy for Sports Development," the state emphasized the need to "carry forward the spirit of the women's volleyball team into the next era, strengthen team cohesion, and

improve combat effectiveness." Improving team cohesion is crucial to China's new path toward becoming a modern and great nation. Generally, the more a team's cohesion, the more efficient its activities and the greater its members' willingness to communicate (Stevens, Rees, & Cruwys, 2021). They are also more passionate and satisfied with the tasks they conduct together, and they can attract one another, feel emotions, and cooperate to attain the team's goals (González-García, Martinent, & Nicolas, 2021).

Simultaneously, a high level of coherence will boost team members' morale, make it apparent why they do things, encourage deliberate and meticulous training, and continuously improve performance and skill levels (Subijana et al., 2021). If the team has many internal problems, the members are unhappy, do not function well together, and lack a positive attitude. This can not only excite team members about training but can also be used to create barriers, affecting training quality and competition results purposefully. In addition, sports-related research indicates that team participation is highly motivated since each member regards the team's objective as his task and the team's code of behavior as his code of conduct. To enhance team cohesion, complementary and effective leadership is essential (Lopez de Subijana et al., 2021). Most sports leadership study in China focuses on coaches and examines the impact of their behavior on athletes and teams (Macquet & Stanton, 2021).

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Although the results help promote the establishment of team goals, it is too specific to use coaches as the primary source of leadership for an extended period, and coaches tend to exhibit authoritarian decision-making behavior. Once this occurs, it will result in a drop in athlete happiness; a lack of trust; and a standstill in the connection between coaches and athletes, significantly hindering team cohesion. Their causal relationship, cohesion, and success are mutually reinforcing. So, a team with excellent cohesion is more likely to succeed (Maechel et al., 2021). Figure 1 depicts leadership and cohesion within a team.

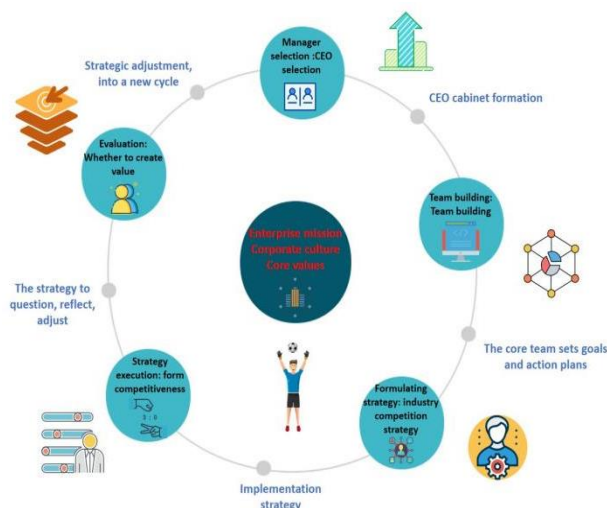


Figure 1. Team leadership and cohesion.

As the construction of China's sports force continues to advance, it becomes increasingly difficult to meet team development needs by depending solely on coaches as team leaders. We should pay greater attention to the phenomena of leadership from the perspective of coaches and place a premium on the development and creation of leadership in athletes. To further enrich China's leadership system and improve team development and cohesion, this study will examine, for the first time, from the perspective of Chinese athletes, whether the leadership of athletes plays a role in the team and examine the existing intervention and adjustment mechanisms in greater detail. The results will help us understand the impact of athlete leadership on team performance, which has practical implications for enhancing team effectiveness and athletic performance.

2. Literature Review

Athlete leadership is "performing a formal (such as captain) or informal leadership role in a team that advises or assists team members in achieving common objectives." González-García and Martinent (2020) classified four categories of athletic leadership. They have distinct functions within the team. Task-based leaders are adept at

assisting coaches in the development of training plans; motivational leaders can actively mobilize the emotions of team members and ensure that everyone maintains a positive training attitude; social leaders can motivate team members to participate in social activities actively; external leaders are responsible for propagandizing within the team and holding meetings with other leaders on behalf of the team; and external leaders are responsible for the dissemination of propaganda within the team and holding meetings with other leaders on behalf of the team (Gomes, Almeida, & Resende, 2020). Kim et al. (2020) feel that the development of team cohesion is related to the leadership of athletes in terms of how it influences team cohesion.

When athlete leadership is strong, it can unify the team, increase player faith in the leadership of athletes and coaches, make the entire team more united, and support the improvement of team cohesion. Poor leadership among athletes, on the other hand, will render the entire team disorganized and difficult to manage, resulting in a major decrease in team cohesion (López-Gajardo et al., 2022). In western nations, there is a correlation between the leadership of athletes and team cohesion. As a result of cultural differences between China and the West, Chinese athletes are immersed in an atmosphere that places a disproportionate amount of emphasis on the authority of coaches. The leadership position of athletes may be very passive, and their influence inside the squad is unknown.

De Backer et al. (2022) noted that an athlete's leadership conduct is essential for improved team performance. This facilitates the achievement of common objectives when strategic performance improvement is essential. Worley, Harenberg, and Vosloo (2020) also revealed that athlete leadership style influences team cohesion in sports performance. Players must assume a leadership position to execute many roles and steer the team in a unified direction to increase their performance. When strategic activities are necessary to improve the team performance of athletes with a leadership style of athletes, the dependability of sports performance is increased.

Likewise, Wallace and Shipherd (2020) emphasized that athlete leadership is reliable for enhancing team cohesion to increase team performance and teamwork. Every team's players can build psychological bonds with each other if they receive information on enhancing their conduct through a more effective leadership style. In addition, Bandura, Kavussanu, and Ong (2019) concluded that team leadership and athlete performance is the most effective technique for enhancing team-related behavior. With team cohesion and players' appreciation for each other's values and efforts in the game, it is feasible to boost team performance strategically.

Loughead et al. (2020) highlighted the necessity of athlete leadership in youth support to enhance athletes' performance. Adolescent athletes who play on a team must cultivate mutual understanding to increase their performance. Nevertheless, Oh and Yoo (2023) stressed social norm adoption to enhance team performance. Stability in team performance would be a strategic issue for enhancing the cohesive behavior of a team. If the players lacked patience, reaching the same aims through a unified performance would be difficult.

Likewise, Weiss, Moehnke, and Kipp (2021) noted that the coach's motivation of the players could influence team performance. It encourages players to adopt a variety of behaviors while playing a game. Such motivation for the coach can be a means of enhancing the coach-team performance relationship. Similarly, Smith and Moore (2019) reported that strategic actions regarding team performance are effective in enhancing the strategic actions of athletes. When team performance is essential, player cohesion is required, which can be impacted by the leadership-like efforts of athletes.

Indeed, Sajid et al. (2020) observed that the importance of team cohesion stems from the fact that it improves players' performance. In the lack of coherence, players' sense of self-efficacy and performance suffers. Gu and Xue (2022) also emphasized that mental enhancement and psychological association of athletes in team performance might enhance team performance. The athletes must be driven to develop their strategic conduct to perform better using strategic activities during the game. Formally, a team's leadership style enhances the participants' performance.

In addition, Loughead, Duguay, and Hoffmann (2019) noted that sport cohesion among football players influences player performance. Players' sporting cohesion is enhanced when they work deliberately to improve their performance. The influence of leadership style on team performance and cohesion cannot be overlooked (Kurtenbach & Strong, 2022; López-Gajardo et al., 2021). Thus, a leadership-like style of team performance and player mentality is required to improve their strategic performance. The coach's motivation and the players' well-being contribute significantly to the team's performance.

Some studies support the association between emotional infection and leadership and team cohesion among athletes. However, there are currently few studies in the field of sports that directly examine the influence of athletes' leadership on team cohesion through emotional infection; it has to be determined whether emotional infection plays a role. The research's hypotheses are stated below;

H1: Multiple dimensions of athletes' leadership can significantly predict team cohesion.

H2: Emotional infection as a dependent variable added to the regression analysis can significantly improve the predictive effect of athletes' leadership on team cohesion.

H3: Emotional infection as a dependent variable added to the regression analysis plays an intermediary role between athlete leadership and team cohesion.

H4: Sports grade plays a significant role in the adjustment between athletes' leadership and team cohesion.

3. Methodology

3.1 Population

This study began by analyzing the reliability of the athletes' leadership questionnaire, group environment questionnaire, and emotional infection scale using exploratory factor analysis. The correlation analysis was then utilized to examine the relationship between leadership, team cohesion, and emotional infection characteristics. The moderated test method was then utilized to assess the moderating influence of sports grades mediating between players' leadership and team cohesion. This questionnaire is disseminated online due to the impact of the epidemic. 342 athletes from 12 provincial and local sports teams served as the study's participants. Before disseminating the questionnaire, the author contacted local sports team leaders and coaches. The coaches distributed the questionnaire consistently after receiving consent. After collecting the questions, the questionnaire data were sorted and inspected, and invalid questionnaires, such as those with repeated filling or missing data, were eliminated, leaving 316 genuine questionnaires. The questionnaire covered volleyball, basketball, rugby, and other sports, with 172 male athletes representing 56.5% and 144 female players representing 56.5%. The average age is 22.8 years (standard deviation = 3.86), and the average training period is 7.5 years (standard deviation = 5.41). There are seven world-class athletes, twenty-six national athletes, 121 first-tier athletes, eighty-eight second-tier athletes, and seventy-four third-tier athletes.

3.2 Athlete leadership

The sports leadership questionnaire was developed based on the definitions of four leadership roles. Participants must first select an athlete leader, such as the captain (but not restricted to the captain), and then score the athlete leader. Each of the four components of the questionnaire, which are the task-based, motivating,

social leader, and external, contains three items. Using Likert's 5-level scoring approach, the type of leadership is more apparent the higher the average score of each dimension from 0 (very poor leader) to 4 (very good leader). Following the reliability test, the clonal Bach coefficient of the questionnaire is 0.95, indicating that the questionnaire is of high quality and suitable for further investigation.

3.3 Team cohesion

The "Group Environment Questionnaire" was used for measurement. The questionnaire consisted of 13 positive questions and 2 reverse questions. The questionnaire measured the degree of individual members' involvement in group tasks and group social interaction, respectively. Likert's 7-point scoring was used, ranging from 1 point (very disagree) to 7 points (very agree), in the positive topic, such as "Our team is united in the process of achieving the goal," the higher the score is, and vice versa. To establish the application of the questionnaire, its reliability was evaluated after data collection; the questionnaire's Cronbach's alpha coefficient is 0.87, indicating that it is of high quality and may be utilized for future studies. [Haddad, O'Connor, and Burns \(2022\)](#) believed the number of athletes with leadership roles was associated with developing team cohesion. Team cohesion would rise with the advent of various athletes with varied roles ([Haddad et al., 2022](#)).

3.4 Emotional infection

The Emotional Infection Scale was used to measure the emotional infection of sportsmen. There are 12 items in the questionnaire, such as "when individuals around me are especially nervous, I will become nervous as well." Likert's 5-point scoring is employed, ranging from 1 (totally inconsistent) to 5 (entirely consistent), with the greater the score, the more susceptible the emotion. After testing, the questionnaire's internal consistency is 0.87, indicating high quality and may be utilized for further study ([Coker, Cotterill, & Griffin, 2022](#)).

3.5 Data analysis

SPSS 26 was used to process the gathered data for this investigation. The athletes' leadership questionnaire, group environment questionnaire, and emotional infection scale were subjected to exploratory factor analysis to determine their dependability. The correlation analysis was then utilized to examine the relationship between leadership, team cohesion, and emotional infection characteristics. The interaction between athletes' leadership, emotional infection, and team cohesion was further examined using stepwise

regression analysis. Utilizing the Bootstrap approach to determine whether emotional infection substantially moderates the relationship between the behavior of athletes and team cohesion. The moderated test method was then utilized to assess the moderating influence of sports grades mediating between players' leadership and team cohesion. This study will investigate the relationship between athletes' leadership and team cohesion from the athletes' perspective, as well as the role of emotional infection as a mediator between the two and as a regulator between sports grade and team cohesion.

4. Results

4.1 Common method deviation test

Since the data in this study are all from self-reported athletes, there may be common methodological bias. To minimize this problem, this study followed strict procedures such as anonymous questionnaire measurement and standardized measurement ([Weiss et al., 2021](#)). After data recovery, the Harman single-factor test was used to test the common method deviation of the collected data. The confirmatory factor analysis results showed that: $\chi^2=2806.602$, $df=737$, $\chi^2/df=3.808$, $GFI=0.676$, $CFI=0.780$, $NFI=0.724$, $TLI=0.767$, $RMSEA=0.092$, this proves that there is no serious problem of common method deviation in the data of this study (see [Table 1](#)).

Table 1

Common method deviation test table

	X ²	2806.602
Df		737
χ^2/df		3.808
GFI		0.676
CFI		0.780
NFI		0.724
TLI		0.767
RMSEA		0.092

4.2 Relationship between athletes' leadership, group cohesion, and emotional infection

Athlete leadership is positively correlated with eight items, including task-based leadership, motivational leadership, social leadership, external leadership, group cohesion, social cohesion, task cohesion, and emotional infection, according to the Pearson correlation test between three variables (see [Table 2](#)). In addition, the correlation coefficients are 0.973, 0.967, 0.973, 0.890, 0.529, 0.412, 0.564, and 0.509, respectively, and are statistically significant ($p<0.01$). Also, this gives a prerequisite for future research.

Table 2

Pearson correlation test of the relationship between athletes' leadership, emotional infection, and team cohesion

Average value	M	SD	1	2	3	4	5	6	7	8	9
Athlete leadership (1)	2.954	0.926	1								
Task-based leadership (2)	2.979	0.941	0.973**	1							
Motivational leadership (3)	3.127	0.886	0.967**	0.932**	1						
Social Leadership (4)	2.950	0.964	0.973**	0.923**	0.921**	1					
External leadership (5)	3.383	0.798	0.890**	0.854**	0.867**	0.830**	1				
Team cohesion (6)	5.636	0.829	0.529**	0.511**	0.535**	0.546**	0.596**	1			
Task cohesion (7)	5.917	1.011	0.564**	0.544**	0.537**	0.583**	0.523**	0.943**	1		
Social cohesion (8)	5.395	0.783	0.412**	0.396**	0.454**	0.423**	0.588**	0.916**	0.732**	1	
Emotional infection (9)	3.788	0.704	0.509**	0.478**	0.508**	0.499**	0.563**	0.544**	0.500**	0.513**	1

Note: * p<0.05 ** p<0.01; The following table is the same as

4.3 Relationship test of athletes' leadership, emotional infection, and team cohesion

Hierarchical multiple regression analysis was utilized to investigate the association between players' leadership, emotional infection, and team cohesion based on correlation analysis to reflect the relationship between various factors more deeply (Table 3). This method was done in two stages: first, the leadership of athletes was

employed as the independent variable, and then the dependent variable of team cohesion was analyzed using regression. The second phase determines whether adding emotional infection may considerably enhance the overall explanation level of athletes' leadership to team cohesion. It is determined whether the mediating impact of emotional infection has reached a substantial degree based on whether the R2 created by the previous two processes has altered significantly.

Table 3

List of analysis results of athletes' leadership, emotional infection, and team cohesion

Serial number	Model	independent variable	B	SE	β	R ²	ΔR ²
Athlete leadership	Step 1	Athlete leadership	0.475**	0.043	0.529**	0.28	
	Step 2	Emotional infection	0.436**	0.061	0.370**	0.382	0.102
Motivational leadership		Athlete leadership	0.305**	0.047	0.341**		
	Step 1	Motivational leadership	0.501**	0.044	0.535**		
	Step 2	Emotional infection	0.433*	0.061	0.367**	0.286	0.1
Social Leadership		Motivational leadership	0.326*	0.049	0.348**	0.386	
	Step 1	Social Leadership	0.470**	0.041	0.546**		
	Step 2	Emotional infection	0.426**	0.06	0.361**	0.298	0.098
External leadership		Social Leadership	0.315**	0.044	0.365**	0.369	
	Step 1	External leadership	0.619**	0.047	0.596**		
	Step 2	Emotional infection	0.358**	0.062	0.305**	0.355	0.063
Task-based leadership		External leadership	0.441**	0.054	0.424**	0.418	
	Step 1	Task-based leadership	0.450**	0.043	0.511**		
	Step 2	Emotional infection	0.458**	0.06	0.389**	0.26	0.117
		Task-based leadership	0.286**	0.045	0.325**	0.377	

It can be seen from Table 3 that in the first step, athlete leadership can significantly predict team cohesion (β=0.529, p<0.01). At the same time, the four dimensions of athlete leadership can significantly predict team cohesion: Motivational leadership (β=0.535, p<0.01), social leader (β=0.546, p<0.01), external leader (β=0.596, p<0.01), task-based leadership (β=0.511, p<0.01). Step 2 After adding emotional infection, the explanation of

athletes' leadership to team cohesion increased by 10.2%. The prediction effect was significant (β=0.341, Δ R²=10.2, p<0.01), while maintaining a significant level, the four dimensions of athletes' leadership, the explanation of team cohesion has also increased in varying degrees: Motivational leadership (β=0.348, Δ R²=0.1, p<0.01), social leadership (β=0.365, Δ R²=0.098, p<0.01), external leader (β=0.424, Δ R²=0.063, p<0.01), task-based leadership (β=0.325, Δ R²=0.117, p<0.01).

4.4 Mediation effect test of emotional infection

After understanding the relationship between athlete's leadership, emotional infection, and team cohesion, it is understood that the influence of athlete's leadership on team cohesion may be at least partially realized through emotional infection, that is, athlete's leadership first acts on athlete's emotional infection, and the latter further affect team cohesion. In this relationship, emotional infection plays an intermediary role. Therefore, this study examined the possible mediating effect of emotional infection.

Table 4, it is observed that from path c whether the overall effect of the prediction variable on the dependent variable is significant. Path c 'shows whether the prediction variable's direct effect on the dependent variable is still significant after controlling the intermediate variable. From path ab, it is required to see whether the indirect effect of the prediction variable acting on the dependent variable through the intermediary variable is significant. If the indirect effect indicated by path ab does not include 0 within the 95% bias correction confidence interval, the

indirect effect is significant. It supports the assumption that at least part of the intermediary effect exists. It can be seen from Table 4 that the total effect of athlete leadership on team cohesion is significant ($c=0.475$, $p<0.01$).

After controlling emotional infection, athlete leadership still significantly affects emotional infection ($c'=0.306$, $p<0.01$). At the same time, the indirect effect of athletes' leadership on dependent variables through emotional infection is significant ($a*b=0.17$, $p<0.01$, 95% BootCI=0.123~0.252). Similarly, Table 4 shows that emotional infection is an intermediary between the four dimensions of athletes' leadership and team cohesion. Social leader type ($a*b=0.156$, $p<0.01$, 95% BootCI=0.115~0.243), incentive type ($a*b=0.175$, $p<0.01$, 95% BootCI=0.123~0.249), task type ($a*b=0.164$, $p<0.01$, 95% BootCI=0.125~0.247), external type ($a*b=0.18$, $p<0.01$, 95% BootCI=0.097~0.241). The above results show that the mediating effect of emotional infection is significant, and it plays a role in athletes' leadership and its four dimensions and team cohesion. Therefore, hypothesis H3 is verified.

Table 4

Test results of mediating effects of various dimensions of athletes' leadership on team cohesion through emotional infection

category	c	a	B	a*b	a*b	c
	Total effect			Intermediary effect	(95% BootCI)	Direct effect
Athlete leadership	0.475**	0.388**	0.437**	0.170	0.123~0.252	0.306**
Social leader type	0.471**	0.366**	0.427**	0.156	0.115~0.243	0.315**
Motivational	0.501**	0.405**	0.433**	0.175	0.123~0.249	0.327**
Task-based	0.451**	0.358**	0.459**	0.164	0.125~0.247	0.287**
External type	0.620**	0.498**	0.360**	0.180	0.097~0.241	0.442**

4.5 Adjustment effect test of exercise level

The author will classify the enrollment conditions of high-level sports teams following the "Guiding Opinions on Further Improving and Standardizing the Recruitment Work of High-level Sports Teams in Colleges and Universities issued by the Ministry of Education and the General Administration of Sport of the People's Republic of China." Athletes of level 1 and above are considered high level, while athletes of level 2 and below are considered low level. To determine whether athletes of different grades feel differently about team cohesion, There were 144 high-level athletes and 172 low-level athletes, each with an average age of 21.2 years. The two groups did not significantly differ from one another. During the analysis process, some studies have shown that if the adjustment variable is categorical data during the adjustment analysis, it is usually necessary to conduct dummy variables before the analysis. Therefore, this study analyzed all the collected

sports grade data into dummy variables and put gender and age as control variables into the first model, put the leadership and sport level of athletes into the second model, and finally put the interaction item of the leadership and sport level of athletes into the third model, and finally analyze the regulatory effect based on the significance of the interaction item in the third model.

It can be seen from Table 5 that age and sex in the control variables did not pass the F test ($F=1.148$, $p>0.05$), which means that they will not affect the group cohesion. In the main effect, athlete leadership can positively and significantly predict team cohesion ($\beta=0.531$, $p<0.01$). Among the interaction items, the interaction item between athlete's leadership and sports level also reached a significant level ($\beta=0.355$, $p<0.01$). The above results show that sports grade plays a significant role in adjusting athletes' leadership and team cohesion. To further test the moderating effect of sports grade between athletes' leadership and team cohesion, in this study, the sports

grade is divided into high level (M+1SD) and low level (M-1SD), the slope diagram of the adjustment effect of this

study is made with team cohesion as the ordinate and athlete leadership as the abscissa. As shown in Figure 2.

Table 5

The regulatory effect of sports grade on athletes' leadership and team cohesion

Serial number	B	B	R ²	ΔR ²	F
1. Control variables			0.007	0.007	1.148, p=0.319
Gender	0.004	0.002			
Age	-0.010	-0.085		0.001	30.554, p=0.000
2. Main effect			0.282		
Athlete leadership	0.476**	0.531			
Sports level	-0.064	-0.039			
3. Interactive items			0.320	0.038	17.219, p=0.000
Athlete leadership * sport level	0.355**	0.307			

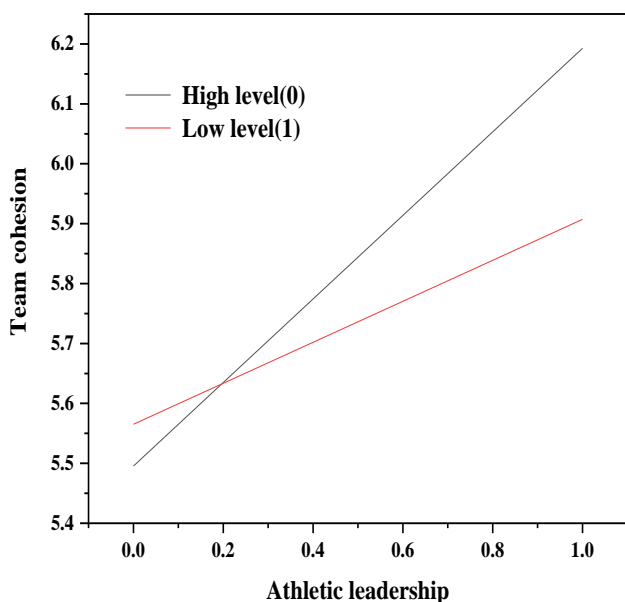


Figure 2. The regulatory effect of sports grade on the relationship between athletes' leadership and team cohesion.

The range of the slope at the high level is significantly greater than that at the low level, indicating that in the case of strong athletes' leadership, the team cohesion of the high-level group is significantly greater than that of the low-level group and that as athletes' leadership declines, the team cohesion of the high-level group is also significantly declining. This is evident from Figure 2, which demonstrates that whether the level of sport is high or low, athlete leadership positively influences team performance. While low-level athletes will also experience a reduction in team cohesion due to their leadership, this decline is substantially less severe than that of high-level athletes. Consequently, sports grades can effectively alter the relationship between players' leadership and team cohesion as an adjustment variable.

5. Discussion

The correlation analysis of 317 athletes' variable data gathered for this study reveals (see Table 2) that team cohesion, social cohesion, and task cohesion of athletes are significantly positively connected with emotional infection, as well as leadership of athletes and its many dimensions. Athletes who perceive stronger team leadership will be more united in attaining team goals and maintaining social engagement. The strongest association between external leadership and societal cohesion is based on the correlation coefficient. This study did not support the hypothesis that social leaders influence social cohesion the most. Through an in-depth understanding of external leaders, they believe that external leaders are also socially oriented in teams. This is because external leaders, as the liaison between the team and the external environment, must clearly understand the team's situation and get along better with team members.

When external leaders are accountable for in-team publicity, they will also pay greater attention to the growth of team spirit and culture, increase communication and communication, and create a positive team atmosphere. Thus, fostering the social cohesion of the team. Athletes were most satisfied with team performance and integration when they evaluated their teams' social and external leadership responsibilities. External leadership has a significant impact on team cohesion. Social leadership has the strongest correlation coefficient regarding task cohesion, which contradicts the notion that "motivational leadership promotes team task cohesiveness more effectively." A study of the relevant literature demonstrates that social leaders prioritize fostering excellent internal connections and minimizing conflicts. Hence, if the athletes' team needs to work together to achieve the

assignment, the social leader can strengthen the tacit understanding amongst the teammates by altering their relationships, thereby enhancing the cohesiveness of the team effort.

According to the multi-step regression analysis (Table 3), athlete leadership is substantially associated with team cohesion. In all aspects of an athlete's leadership, task coherence and social cohesion may be predicted accurately. The predictive effect of athletes' leadership and its dimensions on team cohesion was considerably enhanced by including emotional infection as a mediator variable in the regression analysis. In other words, athletes' leadership directly impacts team cohesiveness; secondly, athletes' leaders can regularly communicate with team members in their daily lives, unintentionally transfer their feelings to team members, and develop team-shared emotions, contributing to team cohesion indirectly. In addition, the data confirmed the significance of emotional infection in the relationship between athletes' leadership and team cohesion, confirming the hypothesis (H1, H2).

5.1 Mediation effect of emotional infection

Athlete leadership can greatly predict athletes' team cohesion, and adding emotional infection to the model will significantly enhance the predictive ability of athlete leadership on team cohesion. To research further whether emotional infection mediates the relationship between athletes' leadership and team cohesion, the Bootstrapping method was utilized to examine the potential mediating influence of emotional infection. The results indicate (see Table 4) that emotional infection partially mediates the association between athlete leadership and its four characteristics and team cohesion, suggesting that athlete leadership can influence team cohesion via emotional infection. This result demonstrated that emotional expression by team leaders could have a major effect on team members and offered evidence that emotional infection is an unconscious infection.

From a side perspective, the emotional infection can play a role in a team because the team members trust the athletes' leaders. As a result, the athletes do not question the emotions emitted by the leaders, and the emotions of the leaders are more readily accepted by the athletes. The study hypothesis (H3) is therefore confirmed. Foreign research on the effect of athlete leadership on team cohesion has made some headway in recent years. A study including football, basketball, and volleyball teams revealed that athletic leadership strongly predicts team cohesiveness, while motivational leadership has a bigger impact on team task cohesion. Social leadership has a stronger effect on social cohesion within a team.

5.2 Regulation effect of exercise level

Using the moderating effect test procedure, this study examined whether sports grade moderates the leadership and team cohesion of athletes. The results indicate that sports grade significantly positively predicts team cohesion and can effectively modify the relationship between athletes' leadership and team cohesion. As shown in the slope diagram (Figure 1), the higher the level of the athletes, the greater the team cohesion; however, when players' leadership declines, the cohesion of high-level athletes decreases substantially. This result is consistent with the hypothesis that team cohesion increases with the level of the athletes. Most past research on sports grades has focused on variations with other variables, and there is little explanation for the impact of changes in players' leadership levels.

Yet, some studies indicate that high-level athletes are more mature than low-level athletes in both physical and psychological aspects; therefore, high-level athletes will now focus more on the leadership skills of their coaches and are eager to receive more theoretical support. It may be concluded that when the leader's skill is inadequate or cannot meet the athlete's inner demands, the athlete's trust in the leader will decrease, and the leader's instruction will not be fully obeyed, decreasing team cohesion. Compared to high-level athletes, low-level athletes are primarily dependent on leaders due to their short time, lack of experience, insufficient understanding of the project, relatively young age, simple thinking, and lack of independent thinking ability; consequently, the level of leadership of athletes will not have a significant impact on low-level athletes.

In conclusion, the results confirm the research's fourth and final hypothesis (H4): that athletes' perceptions of their sport's level will influence their team cohesion. When the leadership of athletes is stronger, the athletes will be more persuadable, and the team cohesion will be greater; nevertheless, athletes with a lower athletic ability are less influenced by the leadership of athletes. Therefore, in the future athlete leadership selection system, performance cannot be the only criterion; we must examine athlete leadership holistically; this can meet the psychological needs of athletes at different stages, increase their trust in athlete leadership, and promote the improvement of team cohesion (Subijana et al., 2021).

6. Conclusion

The findings of this study indicate that team cohesion, social cohesion, and task cohesion are highly positively connected with emotional infection as well as athlete

leadership and its many dimensions. In addition, it has been demonstrated that external leaders have the greatest influence on social cohesion, whereas social leaders have the most influence on task cohesion. This study indicated that the predictive effect of athletes' leadership on team cohesion could be greatly enhanced by including emotional infection as an intermediate variable in regression analysis. In addition, this study highlighted the significance of emotional infection as an intermediary between athlete leadership and its four dimensions and team cohesion. Lastly, this study indicated that sports grade regulates the leadership and team cohesion of athletes; the higher the level of the players, the stronger the team cohesion. As athletes' leadership declines, so does team cohesion. Although the low level will also be affected by the leadership level of athletes, the magnitude of influence is considerably less than that of high-level athletes.

7. Theoretical and Practical Implications

This study provided theoretical support for the notion that athlete leadership greatly influences team cohesion. The research has added new results to the body of knowledge that were not mentioned in previous studies. The research has shown that athletes' leadership styles can be utilized to increase team cohesion, which is essential for the optimal performance of athletes. In addition, the study found that sports grade is a crucial element that influences the relationship between athlete leadership and team cohesion. Hence, these findings contribute significantly to knowledge about team cohesion and athlete leadership. The researchers can use these results to comprehend the link between variables and to identify additional elements that could promote team cohesion.

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According to the findings of this study, it is vital to create an external environment for sports that is open and has specific qualities. Initially, it is necessary to define development guidelines, policies, and sports goals according to national circumstances. Second, confront the world, absorb the wonderful culture of other countries, actively integrate their own development into the current world sports development, maximize their strengths, eliminate their shortcomings, and innovate and develop according to national conditions. Moreover, there are numerous ways to improve the cohesion of sports teams involving all elements of society, and it is a complex system project. Still, the core coordinates the various internal and external interactions of sports teams. If this issue is resolved, the sports team must have unity and cohesion, and it will radiate with limitless strength.

8. Future Directions

Despite this, the outcomes of this study have major implications for literature and theoretically advance the field. Similarly, this study's findings have practical implications for enhancing team cohesion. But, the researchers have some suggestions for future investigation. Future research should collect data from different regions to assess these findings' acidification. In addition, future research may employ Smart PLS 4.0 for measurement and structural model assessment, as it is a good way to obtain results when a study's model is complex. Thus, future research must examine the function of psychological health as a mediator between athlete leadership and team cohesion. Based on these recommendations, subsequent investigations would generate more detailed findings for theory and practice.

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