

# Relationship between Athletes' Phubbing and Team Cohesion: A Moderated Mediation Model

Li Zhang<sup>1</sup>, Yuan Liu<sup>1</sup>, Xu Du<sup>2\*</sup>

<sup>1</sup>Department of Physical Education, China University of Mining and Technology, Beijing 100083, P.R. China

<sup>2</sup>Department of Physical Education, Beijing University of Posts and Telecommunications, Beijing, 100876, P.R. China

\*Corresponding Author.

## **Abstract:**

In order to explore the relationship between phubbing and team cohesion and its mechanism of action, a questionnaire survey was conducted on 189 athletes with cell phone use experience using the Phubbing Questionnaire, the Team Cohesion Questionnaire, the Relationship Satisfaction Scale and the Anxiety attachment personality scale under group contextual factors. The results showed that: (1) athletes' phubbing negatively predicted team cohesion; (2) phubbing predicted team cohesion through the mediation of relationship satisfaction; and (3) relationship satisfaction was moderated by anxiety attachment personality. Specifically, athletes with high anxiety attachment personality had a greater predictive effect on team cohesion compared to athletes with low anxiety attachment personality. The results of this study can help to reveal the mechanism of phubbing in athletes' team cohesion, and have implications for the construction of team cohesion in athletes.

**Keywords:** *Phubbing, Team cohesion, Athlete management.*

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## I. PROBLEM FORMULATION

Cohesion, as an important characteristic of groups, can be explained in several ways [1]. Previous studies on cohesion can be understood mainly from two macro dimensions, process and outcome, firstly, from the process perspective, cohesion is the motivational process of going after a goal or object together and the emotional process of bringing people together in a group [2,3], secondly, from the outcome perspective, cohesion is the result of the synergy that keeps results within the group and the choice of individuals to stay with the team in order to achieve their goals [3]. In sports, cohesion has become an important factor in achieving excellence in group sports [4]. Previous studies on team cohesion have focused on intrinsic factors such as interpersonal relationships and coaching styles, but few studies have considered extrinsic factors.

Nowadays, technology has changed the way people communicate, and smartphones have become an essential item in people's lives, adding to the convenience of remote communication while bringing about barriers to face-to-face communication [5, 6]. Seven years ago, the number of smartphone users worldwide reached approximately 3.4 billion [7]. And on the one hand, the appropriate use of smartphones as a tool for communication with others creates good emotional interactions between people [8]. On the other hand,

excessive use of smartphones can lead to the emergence of phubbing [9]. The emergence of phubbing can have a negative impact on interpersonal relationships [10], which can negatively affect the cohesion between the communicating parties [11]. In collective sports, athletes' unity is life, and cohesion is combativeness [4]. Therefore, this study investigates the relationship between athletes' phubbing and team cohesion and its mechanism of action in order to enrich the influence mechanism of athletes' team cohesion and provide a theoretical basis for the scientific development of team cohesion theory.

### 1.1 Phubbing and Team Cohesion

Phubbing is a term that has emerged in recent years and is a combination of phone and snubbing, and is included in the Macquarie Dictionary [12]. Phubbing is a kind of rude behavior in public where the attention is drawn to the cell phone and the partner around is left out, and this behavior can have an impact on social interpersonal interaction [9]. For example, phubbing behavior has a significant negative predictive effect on interpersonal relationship quality [13], happiness [14] and interpersonal object behavior performance [15]; the higher the peer phubbing behavior, the lower their individual happiness [16].

Phubbing may also cause a decrease in team cohesion. Firstly, based on the psychological contract theory, phubbing may lead to the violation of peer psychological valence and psychological contract [17]. And team cohesion is closely related to the psychological contract [18]. The psychological contract is an intangible contract of internal identification between members and the organization [19]. Team cohesion is also an integrating force that responds to the internal unity of team members in terms of goals, feelings and behaviors [4]. Therefore, phubbing may lead to a decrease in team cohesion. Secondly, based on expectation violation theory, individuals have expectations about their partners' relationships, and partners' phubbing may violate such expectations and neglect communication and communication in interpersonal communication [20]. And communication and collaboration play an important role in influencing team cohesion [21]. It was found that communication and collaboration help to promote cohesion [22], and on the contrary, coldness or indifference to relationships affects the development of cohesion [14]. Based on the above analysis and based on the psychological contract theory and expectation violation theory, phubbing may violate the psychological validity of peers and thus cause a decrease in team cohesion. Thus, we propose hypothesis H1 that phubbing can predict team cohesion inversely.

### 1.2 Mediating Role of Relationship Satisfaction

Relationship satisfaction is the relative relationship between what an individual expects from the other party before starting an interaction and the actual feelings received by the other party after giving feedback, and this psychological state is measured numerically [23]. First, phubbing can directly lead to a decrease in relationship satisfaction [24]. Research has shown that when individuals lack attention to their significant other because they are preoccupied with their smartphones, it can lead to a decrease in relationship satisfaction for both [25]. Second, relationship satisfaction can also be indirectly affected. Studies have shown that relationship satisfaction can be influenced by negative emotions, which include distal factors

such as jealousy, neglect, and rejection, and distal factors affect team cohesion through proximal factors [11,26].

Relationship satisfaction can also have an impact on cohesion. Social exchange theory can be seen as a rule for the development of interpersonal relationships with complementary exchange, a synthesis of forms of give and take between members of society [27]. In the context of exchange theory, individuals constantly evaluate the costs of relationships and rewards in the exchange process. The negative emotions triggered under phubbing are considered to be an increase in the cost of giving, while the lack of response from participating members is considered to be a decrease in the cost of reward, and the unequal conditions of giving and rewarding costs may lead to cell phone conflicts and eventually to a decrease in cohesion [11]. Therefore, based on social exchange theory, the negative manifestations of jealousy, anger, and sulking due to phubbing in real life are a reflection of individuals' dissatisfaction with the results of the exchange, which in this case can easily lead to the weakening of cohesion.

In summary, the hypothesis H1 suggests that phubbing affects both cohesiveness and relationship satisfaction. According to the social exchange theory, people constantly evaluate costs and rewards, and in the case of unfair communication between income and expenditure, it may lead to a decrease in cohesion. Therefore, we propose hypothesis H2: phubbing can inversely predict team cohesion through the mediating effect of relationship satisfaction.

### 1.3 Moderating Role of Anxiety Attachment Personality

Attachment theory helps to explain situations and tendencies in the development of interpersonal relationships [28]. Individuals' expectations of interpersonal situations also differ at different levels of attachment [29]. Individuals with high levels of attachment anxiety have a greater need for interpersonal relationships and a higher level of attachment concern [30]. However, individuals with low levels of attachment anxiety are less concerned with interpersonal relationships and are more likely to focus on solving problems on their own rather than through the help of others [31]. Therefore, phubbing may enhance insecurity between individuals, which may lead to conflict and negatively affect relationship satisfaction. However, among individuals with low levels of anxious attachment, phubbing were less likely to contribute to conflict. Individuals with high levels of anxiety attachment expect to seek external approval from others, whereas individuals with low levels of anxiety attachment do not need external approval from others. Therefore, we propose hypothesis H3, that anxiety attachment personality affects team cohesion by moderating relationship satisfaction and moderating the second half of the model's path.

In summary, this study constructs a moderated mediation model based on psychological contract theory, expectancy violation theory, social exchange theory, and attachment personality theory to examine the relationship between phubbing on team cohesion and its mechanism of action.

## II. METHODS

### 2.1 Object

In this study, 200 athletes were randomly selected from national sports teams to complete a standardized group test in a sports group. Among them, 190 subjects met the needs of this study, accounting for 95% of the total number of subjects. After excluding the questionnaires with missing answers and consistent responses, 189 valid questionnaires were obtained, with an effective rate of 99.4%. The age of the subjects ranged from 14 to 30 years old, with a mean age of 24.7 years.

### 2.2 Measurement Tools

#### 2.2.1 Phubbing questionnaire

This study used the 10-item *Phubbing Scale of College Students* developed by Karada et al. (2015) [32], which was used to assess participants' perceptions of phubbing, such as "I think I annoy my friends by playing with my cell phone when they are present". The scale is scored on a Likert-5 point scale, where 1=never, 5=always. The higher the total score of this questionnaire, the higher the level of phubbing. According to the fit indices of the validation factor analysis,  $\chi^2/df = 2.12$ ,  $RMSEA = 0.07$ ,  $NFI = 0.89$ ,  $IFI = 0.94$ ,  $TLI = 0.89$ ,  $CFI = 0.93$ , indicating that the structural validity of the questionnaire is acceptable. In this study, the  $\alpha$  coefficient of the scale was 0.7.

#### 2.2.2 Team cohesion questionnaire

Team cohesion was measured based on the *Sports Team Cohesion Scale* developed by Glass (2002) and modified according to the requirements of this study, using a Likert-6 point scale with 1=strongly disagree and 6=strongly agree. The lower the total score, the weaker the cohesiveness of the team. According to the fit indices of the validation factor analysis of the scale,  $\chi^2/df = 0.99$ ,  $RMSEA = 0.01$ ,  $NFI = 0.87$ ,  $IFI = 1.00$ ,  $TLI = 1.00$ ,  $CFI = 1.00$ , indicating that the structural validity of the questionnaire was acceptable. In this study, the  $\alpha$  coefficient of the scale was 0.6.

#### 2.2.3 Relationship satisfaction scale

In this paper, the *Peer Relationship Satisfaction Scale for College Students*, revised by Wei Yunhua (1998) [33], was selected and modified according to the needs of the study. The scale consists of 20 items, divided into three dimensions, namely interpersonal harmony, interaction and social-emotional, where interpersonal harmony refers to the "social status" among teammates, e.g., "I get gifts from my classmates every time I have a birthday"; interaction refers to the degree of welcome and acceptance by the participants, e.g. "my teammates are willing to listen to my opinions"; social-emotional refers to the degree of interaction with partners in the team, e.g. "my teammates like to be with me". In this study, a Likert-5 scale was used, with 1=not at all, 5=fully, and other numbers in between, and a higher total score represented higher relationship satisfaction. According to the fit indices of the validation factor analysis of

the scale,  $\chi^2 /df = 1.835$ ,  $RMSEA = 0.09$ ,  $NFI = 0.99$ ,  $IFI = 0.99$ ,  $TLI = 0.98$ ,  $CFI = 0.98$ , indicating that the structural validity of the questionnaire was acceptable. In this study, the  $\alpha$  coefficient of the scale was 0.96.

#### 2.2.4 Anxiety attachment personality scale

This paper draws on a widely used and well-recognized self-reported attachment scale, the "Intimate Relationship Experience Scale" developed by Brennan, Clar, and Shaver (1998), which was translated by Li Tonggui and others in China. The scale consists of 36 items, 18 of which are anxiety attachment dimensions and 18 of which are attachment avoidance. According to the needs of the experiment, 8 of the 18 items of the anxiety-attachment dimension were adopted and modified according to the contextual factors. The scale is based on the Likter-6-point scale, with 1=very nonconforming and 6=very conforming. The higher the total score, the higher the level of anxiety attachment, and the lower the score, the lower the level of anxiety attachment. According to the fit indices of the validation factor analysis of the scale,  $\chi^2 /df = 1.45$ ,  $RMSEA = 0.05$ ,  $NFI = 0.98$ ,  $IFI = 0.99$ ,  $TLI = 0.98$ ,  $CFI = 0.99$ , indicating that the structural validity of the questionnaire is acceptable. In this study, the  $\alpha$  coefficient of the scale was 0.9.

#### 2.3 Procedure and Data Processing

In this study, one graduate student was assigned to each sports team for unified guidance and online questionnaire distribution, and a unified guidance language was used in the process to emphasize the authenticity of the responses and the anonymity of the survey. The data were managed and analyzed using spss25.0 software.

#### 2.4 Common Method Bias

The use of self-reported data collection may lead to common method bias. In this study, some control was performed by means of anonymous surveys and reverse scoring of individual questions in the questionnaire. Also, Harman's one-way test was used for common method bias. The results showed that there were 10 factors with characteristic roots greater than 1, of which the maximum variance explained 28.07% of the variance (less than 40%). Therefore, there is no serious common method bias in this study.

### III. RESULTS

#### 3.1 Correlation Analysis of Phubbing, Relationship Satisfaction, Anxiety Attachment Personality, and Team Cohesion

The correlation analysis of the total scores of the four variables of phubbing, relationship satisfaction, anxiety attachment personality and team cohesion showed that phubbing was significantly negatively correlated with relationship satisfaction and team cohesion, but not with anxiety attachment personality; relationship satisfaction was significantly negatively correlated with anxiety attachment personality; and the correlation between anxiety attachment personality and team cohesion was not significant (see TABLE

I for details).

**TABLE I. Descriptive Statistics and Correlation Coefficient Matrix for Each Variable**

Variables	M	SD	1	2	3	4
1. Phubbing	3.04	0.54	1			
2. Relationship satisfaction	3.68	0.68	-0.09**	1		
3. Anxiety attachment personality	2.85	0.85	-0.10	-0.09**	1	
4. Team cohesion	3.21	0.38	-0.32**	0.38**	0.68	1

Note: mean, SD standard  
 \*\*P<0.01  
 3.2

M is the is the deviation.

**Relationship Between Phubbing and Team Cohesion: a Moderated Mediation Model Test**

According to Wen Zhonglin and Ye Baojuan (2014) [34], firstly, model 4 of the spss macro program PROCESS was used to test the mediating role of relationship satisfaction between phubbing and team cohesion. The results showed that phubbing significantly predicted relationship satisfaction,  $a=0.31$ ,  $SE=0.03$ ,  $p<0.001$ ; phubbing and relationship satisfaction entered the regression equation at the same time, and phubbing then failed to significantly predict Team cohesion,  $c'=0.01$ ,  $SE=0.02$ ,  $P>0.05$ . Relationship satisfaction significantly predicted team cohesion,  $b=0.45$ ,  $SE=0.02$ ,  $P<0.001$ . The deviation-corrected percentile Bootstrap method test showed that the mediating effect of relationship satisfaction between phubbing and team cohesion was significant,  $ab=0.13$ ,  $Boot SE=0.03$ , with 95% confidence interval [0.09, 0.19]. The proportion of mediating effect to the total number of effects was  $ab/(ab+c') = 93.31\%$ .

Secondly, the moderating effect of attachment-based personality was tested using model 14 in the SPSS macro program PROCESS. The mediated model test with moderation required the calculation and evaluation of the parameters of 3 regression equations. Equation 1 estimated the overall effect of phubbing on team cohesion; Equation 2 estimated the predictive effect of phubbing on relationship satisfaction; and Equation 3 estimated the moderating effect of attachment personality between phubbing and relationship satisfaction. In each equation, all variables were standardized. The mediating effect by moderation exists if the model estimates satisfy the following 3 conditions: (a) in equation 1, the total effect of phubbing on team cohesion is significant; (b) in equation 2, the predictive effect of phubbing on relationship satisfaction is significant; (c) in equation 3, the main effect of relationship satisfaction on team cohesion is significant and the effect of the interaction term between anxiety attachment personality and relationship satisfaction is significant.

In addition, the source of data in this study was mainly through questionnaires, which were estimated to avoid the problem of covariance. The variance inflation factors of all predictor variables in this study were all below 1.2, so there was no problem of multicollinearity.

**TABLE II. Test of Moderated Mediating Effects of Phubbing on Team Cohesion**

	Equation 1			Equation 2			Equation 3		
	(Benchmark: team cohesion)			(Benchmark: relationship satisfaction)			(Benchmark: team cohesion)		
	SE	$\beta$	t	SE	$\beta$	t	SE	$\beta$	t
Phubbing	0.02	-0.14*	3.23	0.02	-0.25**	7.22	0.02	-0.09**	0.34
Anxiety attachment personality							0.02	-0.07**	-2.65
Relationship satisfaction							0.02	0.07***	13.62
Relationship Satisfaction $\times$ Anxiety Attachment Personality							0.03	-0.07*	-1.51

Note: \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

As shown in TABLE II, equation 1 is significant, phubbing negatively predicts team cohesion, satisfying condition (a); equation 2 is significant, phubbing negatively predicts relationship satisfaction, satisfying condition (b); equation 3 is significant, relationship satisfaction positively predicts team cohesion, and the interaction term between anxiety attachment personality and relationship satisfaction is significant, satisfying condition (c).

In order to explain more clearly the essence of the interaction effect between phubbing and anxiety attachment personality, we divided anxiety attachment personality into high and low subgroups according to the mean plus or minus one standard deviation, and performed a simple slope test. The results showed that for the low subgroup, i.e., athletes with low anxiety attachment personality, the negative prediction of phubbing on relationship satisfaction was significant ( $B_{simple} = -0.56$ ,  $t = 9.60$ ,  $p < 0.001$ ); for the high subgroup, i.e., athletes with high anxiety attachment personality, the effect of phubbing on team cohesion was attenuated ( $B_{simple} = -0.61$ ,  $t = 9.56$ ,  $p < 0.001$ ;  $B_{simple} = 0.56$  enhanced to  $B_{simple} = 0.61$ ).

In summary, the process of phubbing influencing team cohesion through relationship satisfaction is moderated by anxiety attachment personality. For athletes with high anxiety attachment personality, the indirect effect of phubbing on team cohesion through relationship satisfaction  $index = 0.16$ ,  $Boot SE = 0.02$ , with 95% confidence interval [0.08, 0.13]; for athletes with low anxiety attachment personality, this profile effect was larger,  $index = 0.12$ ,  $Boot SE = 0.03$ , with 95% confidence interval [0.11, 0.27].

## IV. DISCUSSION

This study reveals the relationship between phubbing and team cohesion and its role from the group contextual factors of phubbing. On the one hand, we elucidate "how" phubbing works, i.e., it affects team cohesion through the mediating role of relationship satisfaction; on the other hand, we analyze "when it works more", i.e., the first half of this mediating process is moderated by anxiety attachment personality. Athletes with high anxious attachment personalities may be more significant predictors of relationship satisfaction relative to athletes with low anxious attachment personalities. The results of this study have important theoretical and practical implications for the scientific construction and intervention of team cohesion and the management of sports teams.

### 4.1 Phubbing and Team Cohesion

This study found that phubbing was a significant predictor of team cohesion, and the results support the findings of psychological contract theory and expectation violation theory of neglect in interpersonal communication. Previous studies have found that when individuals feel neglected in communication, the intrinsic identity contract within the individual is violated, which contradicts the intrinsic consistency of the individual in team cohesion, and then the intrinsic identity contract is reduced, leading to a decrease in team cohesion. In the expectation violation theory, athletes' trust in each other is reduced when they are weakly affected by the phubbing during the conversation, which is also contradictory to the theory of high trust and high goal congruence in team cohesion. In addition, phubbing also has an effect on interpersonal object quality relationships and interpersonal object well-being. Most of these subjects were single object studies between strangers and friends, partners, family members, bosses and employees, etc., rather than group studies. This suggests that the phubbing of the athlete group also had an effect on their interpersonal object satisfaction.

More importantly, this study found that athletes' phubbing significantly and negatively predicted team cohesion, and this result suggests that phubbing can explain team cohesion to some extent. Therefore, this study expands the perspective of athletes' research on team cohesion. In addition, this study has broadened the scope of the target population of phubbing by studying and exploring the contextual factors based on groups rather than one-to-one or intimate relationships as in previous studies. This suggests that in the daily management of athletes, managers should not only pay attention to the internal team cohesion of athletes, but also pay attention to the external factors influencing the team cohesion of athletes in a timely manner. The negative effects of phubbing on team cohesion, such as those found in this study, can be resolved with effective management by managers.

### 4.2 Mediating Role of Relationship Satisfaction

This study found that relationship satisfaction mediated the relationship between phubbing and team cohesion in athletes, i.e., phubbing influenced team cohesion by decreasing relationship satisfaction. The results support the social exchange theory, which suggests that interpersonal relationships develop as a



result of a mutually reinforcing exchange potential. Previous research illustrates that the ratio of expectations of one party to the actual feedback of the other party before interpersonal interactions measures the quality of communication, and that team cohesion is affected if the difference between expectations and actual feedback is large. Therefore, relationship satisfaction, as a mediating variable, negatively predicted team cohesiveness by cell phones that mediated cold shoulder behavior and team cohesiveness.

In addition, managers can guide athletes to avoid reducing the effect of relationship satisfaction on team cohesion by enhancing their own internal expectations rather than external expectations.

#### 4.3 Moderating Role of Anxiety Attachment Personality

Anxiety attachment personality moderates the first half of the pathway through which phubbing affects team cohesion via relationship satisfaction. Specifically, athletes with high anxiety-attachment personality were more likely to be influenced by the presence of phubbing that decreased relationship satisfaction compared to athletes with low anxiety-attachment personality. Athletes with low anxiety attachment personalities were more likely to focus on themselves rather than on others, whereas athletes with high anxiety attachment personalities were the opposite.

In previous studies, factors such as attachment personality have been used as moderating variables to demonstrate the moderating effect of relationship satisfaction on team cohesion. In the present study, for the first time, attachment personality was discussed specifically to a category of personality relevant to the study, such as anxiety attachment personality, and anxiety attachment personality was discussed in two categories, high and low. In addition, external interventions to redirect the attention of remote mobilizers with high anxious-attachment personalities to the individual could be effective in preventing the decrease in team cohesion affected by the decrease in relationship satisfaction.

#### 4.4 Research Limitations and Prospects

This study also has some limitations: First, this study uses a cross-sectional research design, and although this study is based on certain theories, it is still lacking in inferring the causal relationships and mediating effects between variables. Future studies could choose intervention experimental methods and continue to test the theoretical model in this study through a controlled study of intervention and control groups. Longitudinal follow-up could also be used to continue to explore the causal relationships between variables. Second, some of the questionnaires used in this study are from English literature, and there may be some linguistic bias in the translation, although the reliability and validity are still acceptable, but further validation is needed. Third, the theory of moderating variable selection in this study may be imperfect, and future studies can improve the theory of this variable.

## V. CONCLUSION

In summary, this study found that: (1) athletes' phubbing had a negative predictive effect on team cohesion; (2) relationship satisfaction mediated the relationship between athletes' phubbing and team cohesion; and (3) athletes' phubbing was moderated by the indirect effect of anxiety attachment personality through relationship satisfaction on team cohesion. Specifically, the indirect effect was greater for athletes with high anxiety attachment personality compared to athletes with low anxiety attachment personality.

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