

Impact of coach-athlete relationship on the collective efficacy of young volleyball players

Impacto do relacionamento treinador-atleta sobre a eficácia coletiva de jovens atletas de voleibol

José Luiz Lopes Vieira¹
Luciana Ferreira¹
Francielle Cheuczuk¹
Patric Paludett Flores¹
João Ricardo Nickenig Vissoci²
Francielli Ferreira da Rocha¹
José Roberto Andrade do Nascimento Junior¹
Lenamar Fiorese Vieira¹

Abstract – This study investigated the impact of the coach-athlete relationship (CAR) on the collective efficacy (CE) of young volleyball players. The sample consisted of 185 athletes from male and female teams participating in the Under-18 Paraná Championship. The Coach-Athlete Relationship Questionnaire and Collective Efficacy Questionnaire for Sports were used for data collection. The data were analyzed using the Mann-Whitney U test, Spearman's correlation test, and uni- and multivariate simple regression ($p < 0.05$). The results showed that medalists scored higher in all dimensions of CE (ability, effort, persistence, preparation, and unity) and perceived themselves closer and more committed to the coach than non-medalists ($p < 0.05$). The CAR had a significant and moderate impact on the medalist and non-medalist perception of CE ($p < 0.05$). It can be concluded that CAR is an important condition for the perception of CE in young volleyball players, irrespective of team performance.

Key words: Leadership; Sporting performance; Volleyball.

Resumo – Este estudo investigou o impacto da qualidade do relacionamento treinador-atleta (RTA) na percepção da eficácia coletiva (EC) de jovens atletas de voleibol. Foram sujeitos 185 atletas das equipes masculinas e femininas participantes do Campeonato Paranaense Sub-18 2014. Como instrumentos, foram utilizados o Questionário de Relacionamento Treinador-Atleta/Versão Atleta e o Questionário de Eficácia Coletiva para o Esporte. Na análise dos dados, utilizaram-se o teste “U” de Mann-Whitney, a correlação de Spearman e a Regressão ($p < 0,05$). Os resultados evidenciaram que os atletas medalhistas apresentaram maior nível em todas as dimensões de EC (Habilidade, Esforço, Persistência, União e Preparação) e se perceberam mais próximos e comprometidos com o treinador em comparação aos atletas não medalhistas ($p < 0,05$). O RTA apresentou impacto significativo e moderado na percepção de EC tanto dos atletas medalhistas quanto dos não medalhistas ($p < 0,05$). Concluiu-se que o RTA pode ser considerado uma condição importante da percepção de EC para atletas juvenis de voleibol independente do nível de desempenho das equipes.

Palavras-chave: Desempenho esportivo; Liderança; Voleibol.

1 Universidade Estadual de Maringá. Maringá, PR. Brasil.

2 Faculdade Ingá. Maringá, PR. Brasil.

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INTRODUCTION

Recent studies in sport psychology have shown that the way athletes work together in pursuit of common goals is a key element for the success of team sports^{1,2}. Collective efficacy (CE) refers to the perception of a group's shared belief in its abilities to successfully perform a task³. However, according to the social-cognitive theory⁴, CE can also be understood as the judgment of members regarding the collective capabilities of the group to organize and execute tasks required to achieve preestablished levels of performance.

From this perspective, to the same extent as the results and performance obtained are factors associated with CE, the individual perception of group functioning also contributes to the collectivity of the team⁵. Considering the role of group functioning in sporting performance, in addition to the experience and technical-tactical development of the athletes⁶, another possible explanation for the difference between successful and unsuccessful teams observed in sport psychology studies may be the strength of CE^{7,8}. Studies^{2,9,10} highlight that self-efficacy and CE are more related to the outcomes in the case of sports characterized by high levels of interdependence (e.g., team sport games) compared to sports characterized by lower levels of interaction between members (e.g., individual sports). Thus, studies in the area of sport psychology have analyzed the relationship between CE and group performance in team sports^{8,11,12}. Feltz and Chase¹⁰ emphasize that the main sources of CE in sports are previous experiences, verbal persuasion, leadership, and a motivational climate. However, data regarding other specific psychological sources of CE, such as athlete satisfaction, group cohesion, coach leadership and quality of the coach-athlete relationship (CAR), are still limited^{1,5,13}.

Therefore, this study aimed to explore the gap in current knowledge about the psychological sources that can predict CE in sports. Our intention was to analyze the psychological variable "quality of the coach-athlete relationship (CAR)". Although not considered an antecedent of CE⁹, according to Hampson and Jowett¹, broadening the concept of transformational leadership permits to show that the quality of CAR can interfere with CE as leaders and athletes demonstrate mutual trust and commitment to each other and to the task to be performed.

The quality of CAR has as a theoretical support the three Cs model (closeness, commitment and complementarity) based on the definition of the relationship between two persons. Kelleys et al.¹⁴ defend that factors such as feelings, thoughts and behaviors of the members of a group are mutually and causally linked. The closeness construct describes the emotional tone of the relationship and assesses the emotional ties between coaches and athletes, such as respect, trust, admiration and appreciation for each other. In contrast, commitment measures the cognitive attachment and long-term orientation between coaches and athletes. Complementarity evaluates behavioral transactions of cooperation, responsiveness, and affiliation between coaches and athletes¹⁵.

According to a literature review, only two studies directly explored the relationship between the quality of CAR and CE^{1,13}. These studies observed that the perceptions of athletes about their relationship with the coach significantly influence the CE of soccer players. Despite these findings, further studies are needed since CAR is considered antecedent of different psychological variables in the sports context^{16,17,19}. Furthermore, the present study is relevant since it investigates the elements recommended by Hampson and Jowett¹ for future studies on CAR and CE, such as a different sport (volleyball), age group (young athletes), and performance level (medalists and non-medalists).

Therefore, the objective of the present study was to investigate the quality of CAR and CE in young volleyball players, specifically comparing CAR and CE, and to determine their predictive relationships in athletes of different competitive performance levels.

METHODOLOGICAL PROCEDURES

Subjects

Athletes of all volleyball teams (16 teams) participating in the 2014 Under-18 Paraná Championship, comprising 185 athletes (95 boys and 90 girls), participated in the study. The mean age was 17.27 ± 1.25 years and the mean experience was 4.0 ± 2.38 years. The criterion for division of the sample into two groups (medalists and non-medalists) was the level of sporting performance defined as follows (participation in the Under-18 Paraná Championship, which is the main competition in Paraná for young athletes):

- Medalists: athletes of the teams that finished the competition in 1st, 2nd and 3rd place ($n = 71$), i.e., athletes who won a medal.
- Non-medalists: athletes of the teams that finished the competition in 4th or subsequent places ($n = 11$), i.e., athletes who won no medal.

Instruments

The Collective Efficacy Questionnaire for Sports (CEQS)¹⁹, adapted to the Brazilian context by Paes²⁰, was used to measure the level of CE in the athletes. The instrument consists of 20 items divided into five subscales: ability, effort, persistence, unity, and preparation. The items are rated on a 9-point Likert scale from 0 (not at all confident) to 9 (extremely confident). Confirmatory factorial analysis was performed to verify the factorial structure of the instrument for the sample studied, which showed acceptable fit [$X^2(159)=343.74$; $X^2/d.f.=2.16$; CFI=0.90; GFI=0.89; TLI=0.89; RMSEA=0.08]. The values of compound reliability for internal consistency were satisfactory (ability = 0.83; effort = 0.81; persistence = 0.80; unity = 0.77; preparation = 0.75).

The quality of CAR was measured using the Coach–Athlete Relationship Questionnaire (CART-Q)-Athlete Version validated for Brazil²¹. The instrument consists of 11 items divided into three subscales: closeness,

commitment, and complementarity. The items are rated on a 7-point Likert scale from 0 (strongly disagree) to 7 (strongly agree). Confirmatory factorial analysis showed a satisfactory factorial structure [$\chi^2(36)=69.93$; $\chi^2/d.f.=2.18$; CFI=0.94; GFI=0.93; TLI=0.92; RMSEA=0.08] and the values of compound reliability were adequate (closeness = 0.85; commitment = 0.72; complementarity = 0.83).

Procedures

The study is part of an institutional project, which was approved by the Ethics Committee on Human Research (COPEP) State University of Maringá (Protocol No. 339/2011). First, authorization for the study was obtained from the Volleyball Federation of Paraná. For data collection, the coaches of the teams participating in the 2014 Under-18 State Championship were contacted. The data were collected at the competition in the second half of 2014. All athletes agreed to participate in the study by signing the free informed consent form. Athletes responded the questionnaires in about 35 minutes.

Data analysis

First, the normality of the data was analyzed using the Kolmogorov-Smirnov test. Since the data were not normally distributed, medians and quartiles (Q1-Q3) were calculated. The Mann-Whitney U test was used for comparison between groups (medalists and non-medalists). Spearman's correlation matrix was applied to analyze the relationship between CAR quality and CE ($p<0.05$). The SPSS 19.0 software was used for these analyses.

Different regression models were constructed using the variables that obtained a significant correlation ($p<0.05$) to verify the impact of the quality of CAR on the CE of volleyball players. The existence of outliers was evaluated by Mahalanobis squared distance (DM^2) and univariate and multivariate normality of the variables was assessed using asymmetry ($ISkI<3$) and kurtosis ($IKuI<10$) coefficients. Since the data were not normally distributed, the Bollen-Stine bootstrap procedure was used to correct the coefficients estimated by the maximum likelihood method²² implemented in the AMOS 18.0 software. Bootstrapping was applied to verify the adequacy of the sample for the analysis proposed²³. The DM^2 values did not indicate the existence of outliers and there were no sufficiently strong correlations between variables that would indicate multicollinearity (variance inflation factor < 5.0). The regression coefficients were interpreted according to Kline²⁴: < 0.20 , poor effect; up to 0.49, medium effect, and > 0.50 , strong effect ($p<0.05$).

RESULTS

As can be seen in Table 1, medalists scored higher in all dimensions of CE (ability, effort, persistence, unity, and preparation) when compared to non-medalists ($p<0.05$).

Table 1. Comparison of the level of collective efficacy and quality of the coach-athlete relationship in young volleyball athletes according to competitive performance.

Variable	Medalists (n=71) Median (Q1-Q3)	Non-medalist (n=114) Median (Q1-Q3)	p
Collective efficacy			
Ability	8.00 (7.25-8.75)	7.00 (6.00-8.00)	0.001*
Effort	8.37 (7.50-8.75)	8.00 (7.00-8.50)	0.003*
Persistence	8.00 (7.00-8.50)	7.25 (6.50-8.50)	0.001*
Unity	8.00 (7.25-8.75)	7.50 (6.50-8.25)	0.002*
Preparation	8.25 (7.50-8.50)	7.25 (6.50-8.00)	0.001*
Coach-athlete relationship			
Closeness	7.00 (6.59-7.00)	6.66 (5.67-7.00)	0.001*
Commitment	6.00 (5.33-6.33)	5.33 (4.33-6.00)	0.001*
Complementarity	6.00 (5.75-6.50)	6.00 (5.25-6.50)	0.761

*Significant difference ($p < 0.05$).

With respect to the quality of CAR (Table 1), a significant difference was observed in the subscales closeness ($p = 0.001$) and commitment ($p = 0.001$), demonstrating that medalists feel closer and more committed to the coach than non-medalists do.

Analysis of the correlation between CAR quality and CE in medalists (Table 2) showed that closeness was significantly correlated with persistence ($r = 0.26$), unity ($r = 0.36$) and preparation ($r = 0.30$), and complementarity was correlated with ability ($r = 0.27$), effort ($r = 0.36$), unity ($r = 0.30$) and preparation ($r = 0.31$). In contrast, commitment was only correlated with preparation ($r = 0.36$).

Table 2. Correlation between the dimensions of collective efficacy and coach-athlete relationship in medalists.

Dimension	Closeness	Commitment	Complementarity
Ability	0.20	0.08	0.27*
Effort	0.23	0.23	0.36*
Persistence	0.26*	0.12	0.24
Unity	0.36*	0.15	0.30*
Preparation	0.30*	0.36*	0.31*

Spearman's correlation coefficient. * $p < 0.05$.

In the case of non-medalists (Table 3), closeness was found to be significantly correlated with effort ($r = 0.67$), persistence ($r = 0.52$) and preparation ($r = 0.56$), and complementarity was correlated with effort ($r = 0.65$), persistence ($r = 0.59$) and preparation ($r = 0.45$). In contrast, commitment only showed a correlation with effort ($r = 0.51$).

To evaluate the impact of the quality of CAR on the CE of medalists and non-medalists, after correlation analysis a regression model was constructed for subscales that exhibited a significant correlation ($p < 0.05$). The model for medalists showed that closeness had a significant impact ($p < 0.05$) on the variability in persistence (12%), unity (12%), and prepara-

tion (6%) (Figure 1). Commitment only had an impact on unity (14%) and complementarity had an impact on ability (10%), effort (12%), preparation (12%), and unity (11%).

Table 3. Correlation between the dimensions of collective efficacy and coach-athlete relationship in non-medalists.

Dimension	Closeness	Commitment	Complementarity
Ability	0.19	0.27	0.08
Effort	0.67*	0.51*	0.65*
Persistence	0.52*	0.43	0.59*
Unity	0.46	0.46	0.44
Preparation	0.56*	0.47	0.45*

Spearman's correlation coefficient. * $p < 0.05$.

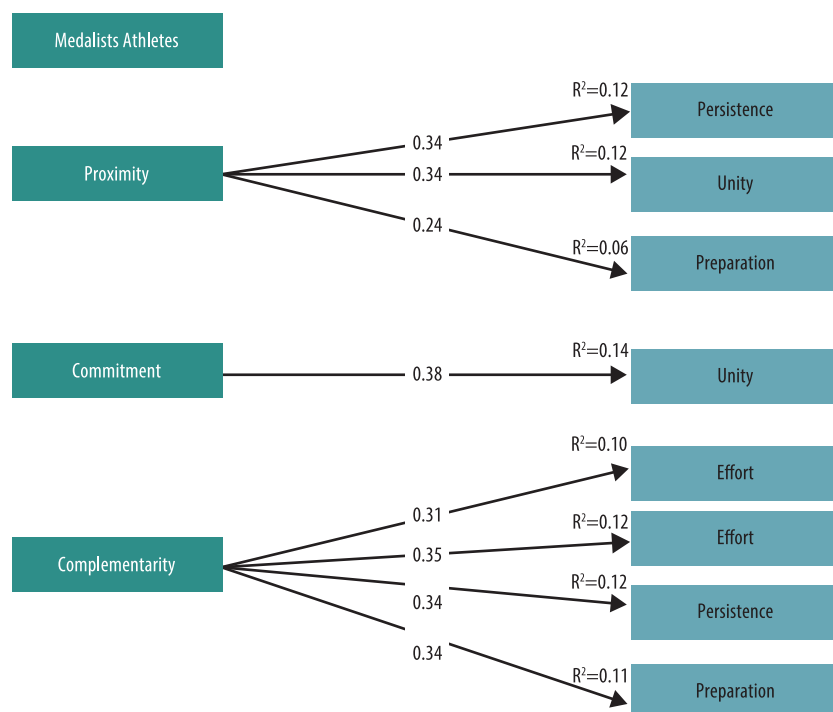


Figure 1. Regression model of the impact of coach-athlete relationship quality on the collective efficacy of medalists.

With respect to the individual trajectories of the regression model (Figure 1), it was observed that an increase in closeness had a moderate impact on persistence ($\beta=0.34$), unity ($\beta=0.34$), and preparation ($\beta=0.24$). Commitment had a moderate impact only on unity ($\beta=0.38$). In contrast, complementarity had a moderate impact on ability ($\beta=0.31$), effort ($\beta=0.35$), persistence ($\beta=0.34$), and unity ($\beta=0.34$).

In the case of non-medalists (Figure 2), closeness was found to have a significant impact ($p < 0.05$) on the variability in effort (8%), persistence (2%), and preparation (13%), while commitment only had an impact on effort (2%). Complementarity had an impact on effort (11%), persistence (7%), and preparation (21%).

Analysis of the individual trajectories of the regression model (Figure 2) showed that an increase in closeness had a moderate impact on effort ($\beta=0.27$), persistence ($\beta=0.15$), and preparation ($\beta=0.36$) of the athletes. Commitment exhibited a moderate impact on effort ($\beta=0.23$), and complementarity had an impact on effort ($\beta=0.32$), persistence ($\beta=0.26$) and preparation ($\beta=0.46$).

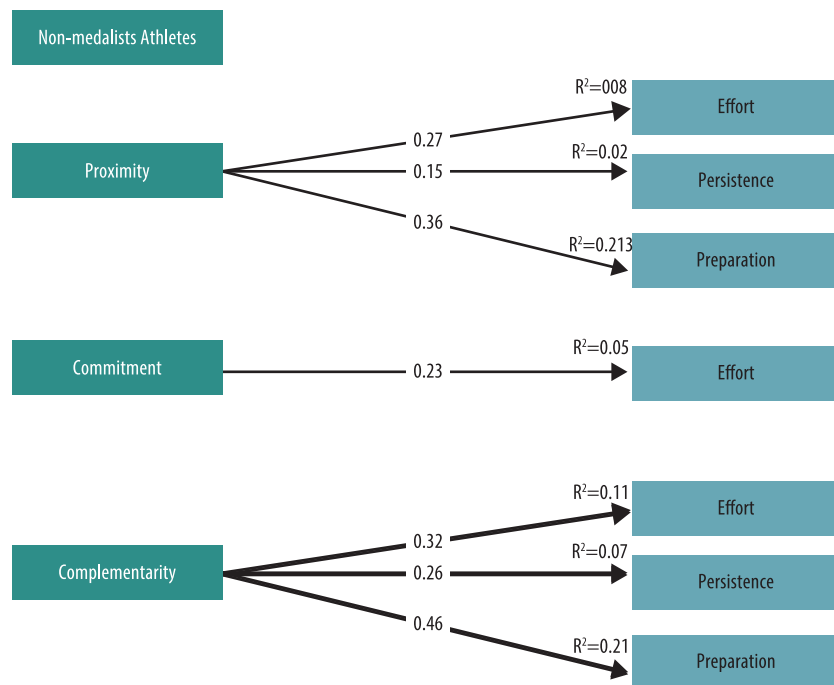


Figure 2. Regression model of the impact of coach-athlete relationship quality on the collective efficacy of non-medalists.

DISCUSSION

The results of the present study indicate advances in the field of knowledge with the ongoing analysis of psychological antecedents of the perception of CE in volleyball, considering that studies investigating sources of this construct are limited. Although the importance of CE for highly interdependent sports such as volleyball has been established in the literature, our findings contribute to the understanding of its psychological antecedents and this is the first study to analyze young athletes of different performance levels. In this respect, the comprehension and understanding of the sources of CE can have different practical implications for coaches involved in the training and development of athletes.

In general, CAR (complementarity, commitment, and closeness) had a positive impact on the perception of CE in both medalists and non-medalists. This finding shows that, irrespective of the level of performance, the better the perception of the athlete about the quality of its relationship with the coach, the better will be the player's confidence in the skills and capacity of the group to successfully perform a task²⁵.

The present results suggest that closeness and complementarity are fundamental characteristics for CE and are independent of the performance

level of young volleyball athletes. These findings agree with the results reported by Hampson and Jowett¹ in a study involving soccer players. The authors observed that the greater the closeness and commitment to the coach and the more the athletes perceive that the coach trusts, respects and appreciates them, the higher the players' perception of CE. When analyzed based on the model of transformational leadership, the present results agree with other studies indicating that the actions and interactions of the leader with members of the group are essential for the development of CE^{8,18}. These studies also show that the more the athletes perceive the centralization of power and feel less social support from the coach, the lower the level of CE of the group. From this perspective, it is relevant to point out that CAR and coach leadership are important psychological sources of CE.

According to Hampson and Jowett¹, the association between CAR and CE is also important to understand the structure and functioning of sport groups since CE, like team cohesion, is a dynamic variable. Previous studies^{26,27} highlight that the better CAR, more athletes work together in the pursuit of team goals (task cohesion) and more they trust the group's capacity to obtain good performance (CE), indicating that CAR characteristics are important predictive factors of group processes.

Although regression analysis indicated an impact of CAR on the athletes' CE, irrespective of the level of competitive performance, medalists exhibited greater perception of CE, i.e., they believed more in the capacity of their teammates and were more confident to obtain good performance (Table 1). Therefore, young athletes that are successful in a competition have a better perception of the ability, persistence, unity and preparation of the team to overcome obstacles than unsuccessful athletes²⁸. Studies^{10,29} have shown that a better perception of CE is intimately related to sporting success since the more an athlete believes and trusts his teammates, the better the cohesion and focus of the group members to be successful in the task²⁵.

Furthermore, medalists feel closer and more committed to the coach, demonstrating that they perceive in the interpersonal environment not only short-term, but also long-term, strong personal and affective bonds of social support¹⁹. These findings agree with the literature^{18,25}, which highlights the importance of the athlete having a close relationship with the coach and being committed for the development of different group processes, such as CE¹, group cohesion²⁶, athlete satisfaction¹³ and, consequently, sporting performance^{5,27}.

Although the present study provided important empirical evidence about the importance of CAR for CE in youth volleyball, some limitations need to be addressed. First, only young volleyball athletes from the state of Paraná were included, which do not represent the reality of volleyball athletes in the country. However, the sample can be considered relevant because all athletes participating in the main youth competition in Paraná were evaluated. Second, only athletes of one sport discipline (volleyball) were analyzed, a fact preventing generalization of the results to the youth sport context in Brazil. This limitation is important since studies have shown differences in the types of effective and preferred leadership

between different sports²¹, indicating that there is no guarantee that the findings obtained here would be similar in other sports. Third, the study was restricted to evaluate only two psychological variables and did not to investigate the knowledge and performance of athletes regarding their tactical and technical functions during the competition. Perhaps, more information on other domains (technical and tactical) would provide more answers, especially when comparing medalist and non-medalist groups. Finally, the cross-sectional design adopted produced a set of significant predictions, but not necessarily causal relationships since only longitudinal designs would permit direct inferences about causal patterns.

Therefore, further studies should to use a longitudinal design and include other modalities and variables are needed in order to establish different relationships, such as the inclusion of the coach's perception together with the athlete's perception. This assessment could provide additional information about the coach-athlete dyad, confirming whether the perceptions of coaches coincide with those of athletes and, consequently, whether both are significant predictors of CE. In this respect, studies comparing leadership styles between coaches and athletes found differences in the style adopted and the style expected when the coach-athlete dyad was investigated³⁰.

CONCLUSION

The present results show that CAR is an important psychological variable for the perception of CE in youth volleyball, irrespective of the level of performance of the athletes. However, athletes with better competitive performance (medalists) had a stronger perception of CE and a better CAR, factors that appear to be determinant for sporting success, considering that only psychological variables were analyzed in the present study.

These findings permit to highlight some practical implications for professionals involved in youth volleyball. First, the evidence suggests that coaches of young athletes should develop an interpersonal environment based on social support, trust, commitment and closeness, since such environment favors integration of the group and improves the perception of individual and collective competence. Another strength of the study is its contribution to the literature regarding CE in the sport context by highlighting the importance of CAR for increasing CE. Hence, despite the limitations cited above, this study is important for researchers in the area of sport psychology since the present findings will contribute to new studies on CAR and CE.

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Corresponding author

Luciana Ferreira
Rua Paranaguá, 565: bloco 11 – apto 22.
CEP:87020-902. Zona 7. Maringá, PR.
Brasil.
E-mail: luferreira.ed@gmail.com