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Is the quality of the relationship with the coach important for boys and girls in school sports?

A qualidade do relacionamento com o treinador é importante tanto para meninos quanto para meninas no esporte escolar?

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ABSTRACT
This cross-sectional study investigated the relations between the perceived coach-athlete relationship (CAR) quality and the motivational regulations. Participants were 301 student-athletes, aged between 14 and 17 years old, participating in the state phase of the School Games. The Coach-Athlete Relationship Questionnaire (CART-Q) and the Sport Motivation Scale II (SMS-II) were used as instruments. For data analysis, the Kolmogorov-Smirnov test, Spearman's correlation and the Structural Equation Analysis ($p < 0.05$) were applied. The CAR quality (Closeness, Commitment and Complementarity) was significantly and negatively associated with boys' amotivation, explaining 16% of its variance, in addition, the Commitment showed a significant association with the Integrated Regulation (3%) and Complementarity was associated with Intrinsic Regulation (9%). As for girls, CAR dimensions explained 16% of the variance of the Identified Regulation, 10% Integrated Regulation and 9% Intrinsic Regulation. The CAR quality seems to be a protective factor against amotivation in males and a potential for self-determined motivation in females.

Keywords: Interpersonal Relations. Self-determination. Sport.

RESUMO
Este estudo transversal investigou a associação entre a percepção da qualidade do relacionamento treinador-atleta (RTA) e as regulações comportamentais de estudantes-atletas. Participaram 301 estudantes-atletas, com idade entre 14 e 17 anos, participantes da fase estadual dos Jogos Escolares de Pernambuco. Os instrumentos foram o Questionário de Relacionamento Treinador-Atleta (CART-Q) e a Escala de Motivação para o Esporte II (SMS-II). Para a análise dos dados utilizou-se o teste de Kolmogorov-Smirnov, Correlação de Spearman e a Análise de Equações Estruturais ($p<0,05$). Evidenciou-se que as dimensões da qualidade do RTA apresentaram associação significativa ($p<0,05$) e negativa com a desmotivação dos meninos, explicando 16% de sua variância. Já a dimensão de comprometimento apresentou associação significativa e positiva com a regulação integrada (3%), e a complementaridade apresentou associação positiva com a regulação intrínseca (9%). Em relação às meninas, as dimensões do RTA explicaram positivamente 16% da variância da regulação identificada, 10% da regulação integrada e 9% da regulação intrínseca. A qualidade do RTA é um fator protetor contra a desmotivação no sexo masculino e potencializador da motivação autodeterminada principalmente no sexo feminino.

Palavras-chave: Autodeterminação. Relações Interpessoais. Esporte.

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INTRODUCTION

Sports environment is a potential promoter of psychological social and emotional capacities, quality of life, well-being and self-esteem[1], as it requires commitment, discipline and dedication on the part of its practitioners, in addition to promoting social interaction among athletes and with their coaches, sport still exposes them to challenging situations, with positive or negative results, a highly educational context[1, 2]. The involvement of children and young people in this context can promote a series of benefits, both for their human development and for its continuity and success towards high sports performance[2], however, it is necessary that its practitioners are motivated so that there is adherence to sports practice, with its consequent long-term results.

Motivation is considered one of the main determining factors for successful experiences in sport, both in sports initiation and in high performance[3-5]. In addition, it is one of the psychological variables that best elucidates the reasons that lead people to be more determined than others in some activities, and essential for long-term adherence to a practice, further illustrating what motivates them to start, continue or even give up on an activity, whether it is sporting or not[3-5].

Among the theories that propose to understand this phenomenon, the Self-Determination Theory - SDT[6] stands out in the area of sport psychology, used as a basis for research on motivational factors in the most different sport scenarios[7], from grassroots sport to high performance[8]. SDT explains the different forms of motivation and its internalization process, when the behavior becomes self-determined, that is, when the determinants of an activity find purpose in the activity itself. According to this theory, the motivation of an individual can be represented by a continuum that starts from amotivation, goes through extrinsic factors of motivation (pressure, punishment, rewards, social visibility, or benefits), and reaches intrinsic levels of motivation, when a practice is made for the pleasure and well-being provided[3-5].

One of the influencing factors in motivation and its development along the presented continuum is social relations[3-5]. In this sense, recent researches[9-11] indicate that important people for athletes, such as family members and the coach, are essential for the development of their motivation[10, 11]. When it comes to the most specifically sporting environment, the relationship between athlete and coach is frequently pointed out in the literature[12] and by professionals as a key element for sports growth[13], development of junior athletes[14], motivation of athletes[11], collective effectiveness[15].

As a way to study and understand the complexity of the Coach-Athlete Relationship (CAR), the 3+1C's model[16] analyzes the feelings of closeness (respect, trust), commitment (lasting relationships), and complementary behaviors (affiliation) and co-orientation (similarity, understanding) mutually and causally interconnected between athletes and coaches, which may even affect a player's satisfaction[16], and have important implications for maximizing sports and psychological results between athletes and coaches[17]. The quality of CAR has been related in the literature to several variables, such as goal orientation[18], athlete satisfaction[19], collective efficacy[20], parenting styles and motivation[10].

Despite such evidence, there is still a gap on studies that relate CAR and motivation in young student-athletes of team sports, which is the gap addressed in this study. Therefore, one of the suggestions of recent studies is to verify the impact of CAR quality on other psychological variables in team sports athletes of different competitive levels[12, 19, 21]. Thus, this study becomes relevant as it can advance

in a field little studied in the Brazilian school sport context, specifically in the northeast region, being able to contribute to the work of coaches and teachers who work with children and youth sports in schools.

Therefore, this study aimed to investigate the relations between the perceived coach-athlete relationship (CAR) quality and the motivational regulations of young athletes in the state of Pernambuco.

MATERIAL AND METHODS

PARTICIPANT

The study population consisted of team sports athletes, aged between 15 and 17 years old, who competed in the Pernambuco School Games. This competition includes student-athletes from all regions of the state, in the following group modalities: basketball, five-a-side soccer, handball, soccer and volleyball. To calculate the minimum number of participants, the formula for finite populations was used, with a confidence level of 95%, with an estimation error of 5% and an expected proportion of 50%[22]. The participation of approximately 2,500 athletes in this competition was estimated, thus requiring a minimum sample of 333 student-athletes considering sample losses. Participants were then 335 student-athletes of collective sports participating in the state phase of the Pernambuco School Games 2016 held in Arcoverde, state of Pernambuco. However, 35 athletes were excluded for not completing the questionnaires properly, resulting in a final sample of 301 athletes, of both genders (136 boys and 165 girls), with a mean age of 16.02 ± 0.83 years. Athletes were competitors in the collective modalities of five-a-side soccer (n = 124), Volleyball (n = 133), Handball (n = 24) and Basketball (n = 20).

Participants were selected by convenience and the selection criteria were as follows: 1) having participated in any region or state level competition during the 2015/2016 seasons; and 2) participating in the state phase of the Pernambuco School Games in 2016. As an exclusion criterion, the complete filling of the instruments was adopted. Only the athletes who had the Informed Consent signed by the coaches (responsible for the athletes in the event) and who verbally expressed the desire to voluntarily contribute participated in the study.

INSTRUMENTS

Sport Motivation Scale II (SMS-II). The instrument was developed by Pelletier et al.[23] and validated for the Brazilian context by Nascimento Junior et al. [24]. This questionnaire consists of 18 items distributed in six subscales: intrinsic regulation, integrated regulation, identified regulation, introjected regulation, external regulation and amotivation, seeking to assess the individual's athletic motivation levels on a 7-point Likert scale, in a continuum from "does not correspond at all" (1) to "corresponds exactly" (7).

Coach-Athlete Relationship Questionnaire (CART–Q). This questionnaire was originally developed by Jowett and Ntoumanis[25] and validated for the Brazilian sporting context by Vieira et al.[26]. The questionnaire assesses the athlete's perception of their relationship with the coach. The scale consists of 11 items distributed in three dimensions: Closeness, Commitment and Complementarity. Answers are given on a 7-point Likert scale with answers ranging from "Strongly Disagree" (1) to "Strongly Agree" (7).

DATA COLLECTION PROCEDURES

The study is part of an institutional project approved by the Research Ethics Committee of the

Federal University of Vale do São Francisco (Opinion 1648086). Initially, contact was made with the Department of Sport of the state of Pernambuco to request authorization for data collection with athletes from teams participating in the 2016 School Games. Collections were conducted at the teams' hotels and lodging places in the city where competition was carried out. The application of the questionnaires was carried out collectively, in a private room, with the absence of the coaches, and questionnaires were filled out within approximately 30 minutes. The order of the questionnaires was randomized among the participants.

DATA ANALYSIS

Data were analyzed Kolmogorov Smirnov normality test. Given the non-normal distribution of data, the Mann-Whitney "U" test was applied to compare the variables between boys and girls. Spearman's Correlation Coefficient was used to verify the correlation between the variables, adopting significance for values of $p<0.05$. Such analyses were conducted using SPSS v.22.0 software. To check the percentage of motivation variance explained by the CAR quality for boys and girls, different Path Analysis models were conducted through Structural Equation Analysis with the variables showing a significant correlation ($p<0.05$). The existence of outliers was evaluated by the Mahalanobis squared distance (MSD) and the univariate normality of the variables was evaluated by the asymmetry coefficients (ISkI<3) and by uni- and multivariate kurtosis (IKuI<10). As the data did not present a normal distribution, the Bollen-Stine Bootstrap technique was used to correct the value of the coefficients estimated by the Maximum Likelihood method[27] implemented in the AMOS 22.0 software. To check the adequacy of the sample for the proposed analysis, we applied the Bootstrapping technique[28]. MSD values indicating the existence of outliers were not observed, nor were there sufficiently strong correlations between the variables that indicated multicollinearity (Variance Inflation Factors<5.0). Based on the recommendations of Kline[29], the interpretation of the regression coefficients was based on: little effect for coefficients <0.20, medium effect for coefficients up to 0.49, and strong effect for coefficients >0.50.

RESULTS

Athletes of both sexes showed very similar levels of motivation, with a low level of amotivation and higher values in regulations closer to the right end of the continuum (self-determined behavior, Table 1). There was a significant difference in external regulation ($p=0.005$), for which boys had higher scores. Regarding the quality of the coach-athlete relationship, both groups presented a coach-athlete relationship of quality. There was a significant difference in closeness ($p=0.001$) and complementarity ($p=0.003$), showing that girls feel more admiration, respect, and trust for the coach, in addition to showing greater affiliation than boys (Table 1).

Table 1. Comparison of motivational regulations and the coach-athlete relationship quality in young athletes from Pernambuco School Games as a function of gender

VARIABLE	Boys (n=136)	Girls (n=165)	*P*
	Md – (Q1-Q3)	Md – (Q1-Q3)	
MOTIVATION			
Amotivation	2.67 (1.16-4.67)	2.33 (1.00-3.33)	0.058
External Regulation	3.67 (2.00-5.00)	3.00 (1.33-4.33)	**0.005***
Introjected Regulation	5.67 (5.00-6.67)	5.67 (4.67-6.67)	0.873
Identified Regulation	6.33 (5.67-7.00)	6.58 (5.67-7.00)	0.472
Integrated Regulation	6.00 (5.16-6.67)	6.33 (5.33-7.00)	0.071
Intrinsic Regulation	6.33 (5.67-7.00)	6.67 (5.67-7.00)	0.205
CAR			
Closeness	6.75 (6.25-7.00)	7.00 (6.75-7.00)	**0.001***
Commitment	6.00 (5.33-6.67)	6.71 (6.00-7.00)	**0.001***
Complementarity	6.50 (6.00-7.00)	6.75 (6.25-7.00)	**0.003***

*Significant difference - $p<0.05$.

When analyzing the correlations between the motivational regulations and the dimensions of the quality of the CAR, it was opted for the analysis as a function of the athletes' gender, considering the differences found in the comparisons between the groups. Analyzing the results for boys (Table 2), it was observed that the three dimensions of CAR quality (Closeness, Commitment and Complementarity) had a negative relationship with lack of motivation ($r=-0.20$, $r=-0.21$ and $r=-0.25$, respectively). The three dimensions of the CAR were still positively related ($p<0.05$) with the identified regulation ($r=0.19$), while the integrated regulation was positively correlated with complementarity ($r=0.17$) and intrinsic regulation was only related to impairment ($r=0.18$).

Table 2. Correlation between CAR quality and motivational regulations for boys and girls

Girls/Boys	Motivational regulations						CAR		
	1	2	3	4	5	6	7	8	9
1- Amotivation	-	0.48**	-0.10	-0.22**	-0.23**	-0.28**	**-0.20***	**-0.21***	**-0.25****
2- External Regulation	0.39**	-	0.28**	0.17*	0.15	0.07	-0.07	-0.03	-0.07
3- Introjected Regulation	-0.10	0.14	-	0.54**	0.47**	0.45**	0.12	0.11	0.15
4- Identified Regulation	-0.08	0.21**	0.50**	-	0.64**	0.58**	**0.19***	**0.19***	**0.19***
5- Integrated Regulation	-0.19*	0.14	0.50**	0.71**	-	0.62**	0.11	0.13	**0.17***
6- Intrinsic Regulation	-0.17*	0.09	0.53**	0.69**	0.62**	-	0.09	**0.17***	0.16
7- Closeness	-0.10	-0.15	0.12	**0.22***	**0.24****	**0.28****	-	0.71**	0.68**
8- Commitment	**-0.19***	-0.02	**0.29****	**0.43***	**0.39****	**0.35****	0.59**	-	0.70**
9- Complementarity	-0.01	-0.02	**0.28****	**0.31****	**0.31****	**0.28****	0.73**	0.69**	-

**. The correlation is significant at the 0.01 level.

*. The correlation is significant at the 0.05 level.

Regarding girls (Table 2), the lack of motivation of these athletes was negatively correlated only with commitment ($r=-0.19$). On the other hand, the Introjected, Identified and Integrated Regulations were positively correlated with all dimensions of CAR ($r=0.22$ to $r=0.43$; $p<0.01$), with the exception of the Closeness for the Introjected regulation. In addition, Intrinsic Regulation showed a significant relationship

($p<0.01$) with Closeness ($r=0.28$), Commitment ($r=0.35$) and Complementarity ($r=0.28$).

To verify the percentage of explained variance of motivational regulations of boys and girls by the dimensions of the CAR quality, after correlation analysis, structural equation models (Path Analysis) were conducted between the subscales that showed a significant correlation ($p<0.05$). In the model for boys, CAR (Closeness, Commitment and Complementarity) had a significant ($p<0.05$) and negative impact on the variability of Amotivation (16%) (Figure 1). In addition, Commitment was significantly associated with Integrated Regulation (3%) and Complementarity was associated with Intrinsic Regulation (9%)

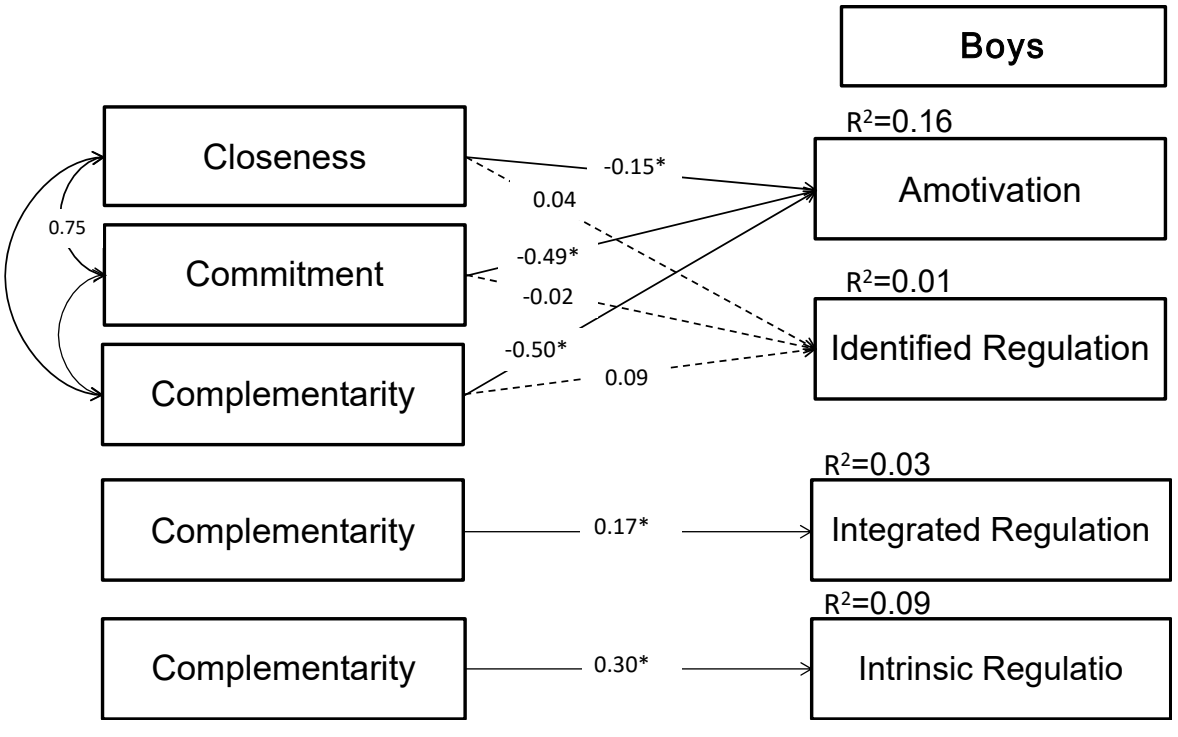

Figure 1. Path Analysis of the relationships between the CAR quality and the motivational regulations for boys.

Regarding the individual paths of the boy's model (Figure 1), the increase in Closeness ($\beta=-0.15$), Commitment ($\beta=-0.49$) and Complementarity ($\beta=-0.50$) had a moderate and negative impact on Amotivation. Commitment showed a weak association with Integrated Regulation ($\beta=0.17$). Complementarity, on the other hand, had a moderate association with Intrinsic Regulation ($\beta=0.3$).

As for girls (Figure 2), Closeness, Commitment and Complementarity model explained 16% Identified Regulation, 10% Integrated Regulation and 9% Intrinsic Regulation. Considering individual trajectories, Closeness and Complementarity had a moderate impact on Identified Regulation ($\beta=0.32$ and $\beta=0.27$) and Integrated Regulation ($\beta=0.26$ and $\beta=0.26$) of athletes. Commitment showed a moderate impact on the Identified Regulation ($\beta=0.36$), Integrated Regulation ($\beta=0.26$) and Intrinsic Regulation ($\beta=0.22$).

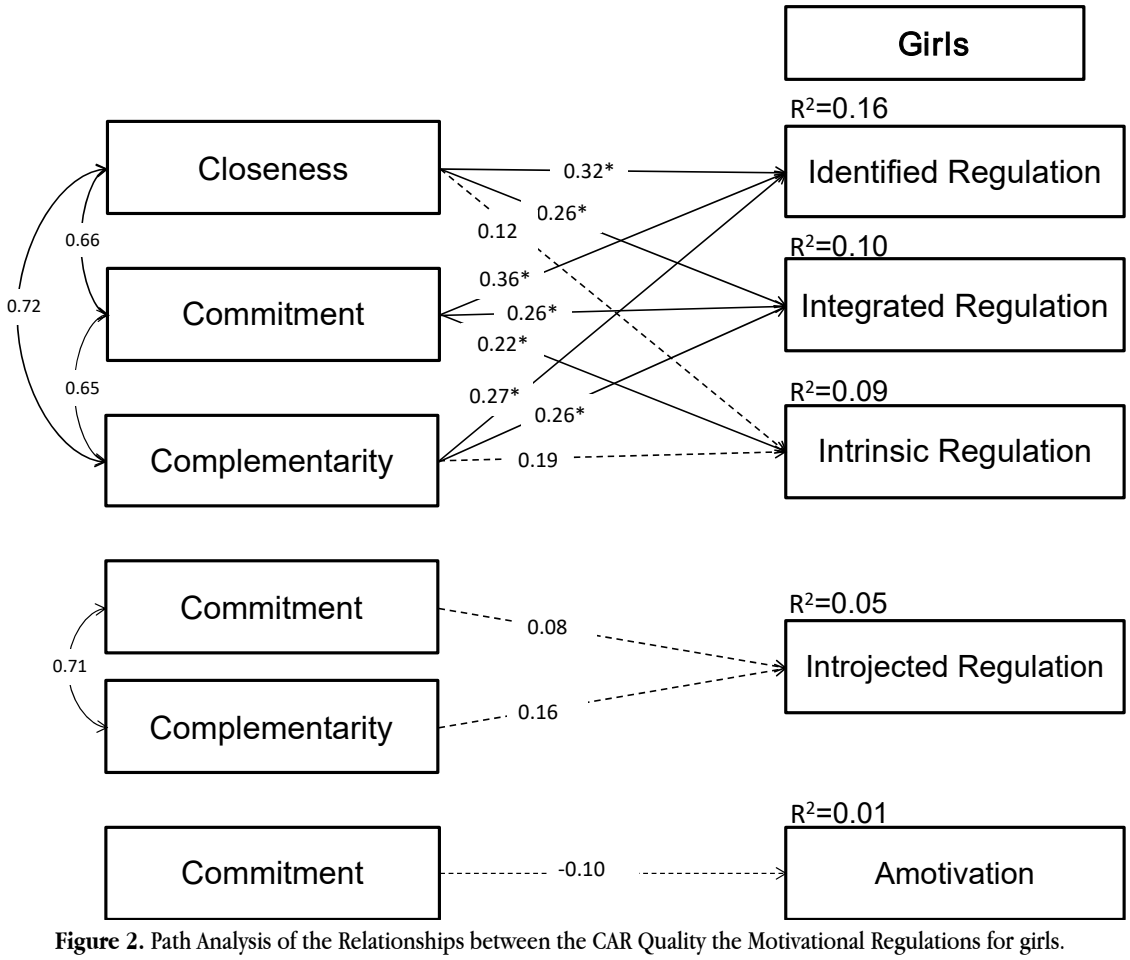

Figure 2. Path Analysis of the Relationships between the CAR Quality the Motivational Regulations for girls.

DISCUSSION

The aim of this study was to investigate the influence of perceived CAR quality on motivation among young athletes from northeastern Brazil. The main findings indicated a negative association of CAR quality with lack of motivation in boys (Figure 1) and a positive association with regulations pertaining to autonomous motivation for girls (Figure 2). Moreover, boys had a higher score in external regulation (extrinsic motivation), while girls reported more admiration, respect and trust for the coach, in addition to showing greater affiliation (Table 1).

One of the main findings of this study was the likely protective role of CAR quality on boy amotivation (Figure 1), indicating that admiration, respect, trust and affiliation with the coach seem to act as protective factors against boys' lack of motivation for sports practice. This result indicates that the relationship with the coach/teacher plays a key role so that the male adolescent does not lose motivation to practice sports[9, 30, 31]. Although recent studies show that amotivation to practice sports is also related to factors such as overtraining, injuries, bullying and low perception of competence[32], the social context is considered one of the main factors involved in amotivation in adolescents[10, 33]. According to Moura et al.[11], the quality of the CAR is important for athletes to perform the sports activities of their own volition, because they feel motivated to perform the proposed tasks.

Furthermore, cognitive attachment (commitment) and affiliation (complementarity) with the coach showed a positive association with the autonomous motivation (integrated and intrinsic regulations) of the boys (Figure 1), indicating that

when the thoughts and behaviors of the boys are mutually related to their coaches/teachers, there is a greater tendency for the boy to present a behavior regulated by intrinsic factors in sports practice[34,35]. The linear association of the CAR quality (commitment, complementarity, and closeness) with the regulations of autonomous motivation (identified, integrated and intrinsic) was also evidenced for girls (Figure 2). These findings demonstrate that the quality of the relationship based on factors such as feelings, thoughts and mutual behaviors seems to develop pleasure in sports practice in both sexes[34, 35].

During adolescence, it is common for physical education teachers and coaches to become behavior mirrors for students and athletes[12, 16], especially when these social peers provide autonomy support for the young person[20]. With that, affective bonds and the cognitive attachment with the teacher/coach lead the adolescent to develop pleasure for the sport practice and, consequently, the self-determined motivation for the sport practice[12].

Such findings (Figures 1 and 2) can be explained by the micro-theory of cognitive assessment of SDT[3, 5], which postulates that intrinsic motivation is greatly affected by social contexts in which the individual is inserted, which can lead to long-term amotivation[5]. This micro-theory highlights that the autonomy support of social peers plays a critical role in promoting intrinsic motivation, especially in the contexts of education, arts and sport[3, 4]. The result of this research corroborates the principles of the theory, as the social context (CAR) can be considered an intervening element in the motivation of boys in this study, acting as a form of protection against amotivation, especially for boys, in addition to favoring the development and maintenance of self-determined behavior for both sexes[9, 36, 37]. In the sports context, the coach plays a key role in the development of self-determined motivation, as they are responsible for the interaction and communication with practitioners and athletes, and for the construction of a pleasant environment during training and competitions[12, 21, 31].

The literature shows that the practices exercised by coaches (e.g., support, involvement and autonomy) positively contribute to the motivation of young people within the sport context[9, 11]. Moura et al. [11] demonstrated in their study with female five-a-side soccer athletes that female athletes had a high level of intrinsic motivation, as well as the dimensions of the CAR (closeness and complementarity). Similar findings were reported by Vieira et al.[20], who observed in volleyball athletes had a positive perception of the relationship with the coach, regardless of being a medalist or not.

It is also noteworthy that boys showed a behavior more regulated by external factors when compared to girls (Table 1), that is, they seem to act more to obtain external rewards or avoid punishment during sports practice. According to SDT Organismic Integration micro-theory, which addresses the different forms of extrinsic motivation, the social context can improve or prevent the internalization of extrinsic motivation towards autonomous behavior. Thus, it can be said that, in the context of school sports, social peers (such as coaches, peers and parents) can directly interfere with the way boys resist, partially adopt or deeply internalize values, goals or belief systems[3, 5], preventing the internalization of motivation in relation to sports practice. This micro-theory particularly highlights the support for autonomy and relationship as critical for internalization of extrinsic motivation[4]. From this perspective, the high levels of external regulation in boys may be related to the fact that parents and coaches create greater expectations, pressure and criticize more boys to obtain better performance[32, 38].

Nascimento Junior et al.[10] found in Brazilian five-a-side soccer team athletes strong indications that the parents' styles of rejection and overprotection were directly related to external regulation, demonstrating that the athletes performed certain activities not for their own pleasure (self-determined) but rather due to the wishes of external agents, such as their parents[23]. This finding is similar to those found by Vieira et al. [33], who point out that overly involved parents can play

a disturbing role, while athletes with disinterested parents may not have the necessary instrumental and emotional support at home to allow them to pursue a career in sport. Thus, for the process of developing self-determined motivation, interpersonal relationships are as important as the ability of young athletes to feel fulfilled by performing their tasks and activities.

Another finding of the study refers to the higher quality of the CAR perceived by girls when compared to boys (Table 1), indicating that girls perceived themselves with greater closeness, commitment, and complementarity with their respective coaches. Despite such differences, both groups had high scores in the three dimensions of the CAR quality, which is essential for sports practice. These findings corroborate Cheuczuk et al. [39] when they verified that both men and women had a high level of quality in all dimensions of the CAR in a study with young volleyball players. According to the 3Cs model[16], athletes who perceive good communication, respect and trust with their coach, consequently feel more motivated to practice sports. This situation is confirmed by Jowett and Shanmugam[31], who point out that dyadic relationships allow the transformation of coaches and athletes, so that an effective connection is beneficial to the feelings of belonging and value within sports teams.

Despite the important findings obtained here, on the coach-athlete relationship and the regulatory styles of motivation of young athletes from the Northeast region, it is extremely important to highlight some limitations. First, the sample consisted only of student-athletes from a Brazilian region, which makes it impossible to generalize the results to the national and international scenario. Nevertheless, athletes were participating in the main school competition of their respective states. Furthermore, the study had a cross-sectional design, evaluating the athletes in only one moment of the season, making it impossible to analyze the cause-and-effect relationships between the variables. With that, suggestion for future research include the participation of athletes from other regions, in order to compare the groups (e.g. winner x loser, collective x individual), as well as the involvement of other variables and with longitudinal design to check the possible changes in motivation cohesion and in the CAR over a season in school sports.

CONCLUSION

In conclusion, the CAR quality seems to be a protective factor against amotivation in boys, in addition to promoting self-determined motivation in both boys and girls. From a practical point of view, the importance of developing an interpersonal environment based on the support of autonomy, trust, commitment, and closeness on the part of physical education coaches and professionals is highlighted, as such an environment tends to contribute to the development of intrinsic motivation of the adolescent within the sport context.

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