



# State of mood, motivation, and impulsivity of young athletes: a cross-sectional study

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KARLA MEDEIROS COSTA<sup>1</sup> , CLAUDIO ANDRE BARBOSA DE LIRA<sup>1</sup> ,  
EDUARDO MACEDO PENNA<sup>2</sup> , MARÍLIA SANTOS ANDRADE<sup>3</sup> ,  
FABIANO DE SUZA FONSECA<sup>4</sup> , DALTON DE LIMA-JUNIOR<sup>5</sup> , PAULO GENTIL<sup>1</sup> ,  
ALBERTO SOUZA SÁ FILHO<sup>6</sup> , GUSTAVO DE CONTI TEXEIRA COSTA<sup>1</sup> 

<sup>1</sup> Federal University of Goiás, Goiânia, Brazil

<sup>2</sup> Federal University of Pará, Belém, Brazil

<sup>3</sup> Federal University of São Paulo, São Paulo, Brazil

<sup>4</sup> Federal Rural University of Pernambuco, Recife, Brazil

<sup>5</sup> Federal University of Paraíba, João Pessoa, Brazil

<sup>6</sup> University Centre of Anápolis, Anápolis, Brazil

## ABSTRACT

**Purpose.** The aim of the study was to compare the mood, motivation, and impulsivity of young athletes of different sexes and ages.

**Methods.** The sample consisted of 147 young student-athletes of both sexes, aged 12–17 years, participating in the regional stage of the Brazilian Youth School Games 2018. The individuals were categorized into 4 groups for analysis considering sex (male vs. female) and age ( $\leq 14$  years and  $\geq 15$  years).

**Results.** (1) Female athletes aged  $\leq 14$  years demonstrated greater instability of mood compared with males of the same age ( $p = 0.009$ ). (2) Female athletes aged  $\geq 15$  years presented less energy and disposition than female athletes aged  $\leq 14$  years ( $p = 0.007$ ) and males aged  $\geq 15$  years ( $p = 0.001$ ). (3) Both female groups (aged  $\leq 14$  years and  $\geq 15$  years) had a higher score than the male group aged  $\leq 14$  years for lack of perseverance ( $p = 0.003$  and  $p = 0.034$ , respectively) and lack of premeditation ( $p = 0.012$  and  $p = 0.013$ , respectively).

**Conclusions.** The mood, motivation, and impulsivity of young athletes have varying characteristics in males and females and these variables are modulated by age.

**Key words:** youth sport, mood, motivation, impulsivity

## Introduction

Sports are a social phenomenon of wide manifestation in schools that allows the transmission of values such as discipline, respect, sacrifice, cooperation, self-esteem, emotional regulation, problem solving, among others [1]. Moreover, competition has been an inseparable element of sport [2, 3]. Students inserted into the sports context are involved in significant experiences that influence their development, such as social interactions, competition, and challenge [2, 4]. Indeed, sports training has appeared as a tool that helps

develop the psychological, social, and cognitive abilities, as well as choose healthy habits in young athletes [5]. However, the student-athlete has an increased sports demand [6, 7] that is often characterized by psychological overload. Mood-state instability is recurrent in young athletes, as they have difficulties dealing with the psychological concerns arising from emotional pressures caused by various factors (e.g., intense training or adverse situations in a competitive environment) [8, 9]. In addition, previous studies that analysed impulsivity [10] in the sports context suggest a possible influence of sex and age on impulsive behaviour [11].

*Correspondence address:* Paulo Gentil, Federal University of Goiás, 74690-900 Goiânia, Goiás, Brazil,  
e-mail: [paulogentil@hotmail.com](mailto:paulogentil@hotmail.com), <https://orcid.org/0000-0003-2459-4977>

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Therefore, the knowledge of the relationships among behavioural and psychological variables in athletes can help in a more global understanding of sports performance [6].

Traditionally, psychometric scales have been used to investigate psychobiological variables in different populations, age groups, and sexes [12, 13]. For example, the Profile of Mood States allows the assessment of mood state by evaluating vigour, fatigue, anger, tension, depression, and mental confusion. Briefly, when individuals present a positive mood state, they can also exhibit a high vigour associated with low levels of fatigue, anger, tension, depression, and mental confusion [14]. Current research on sports with youth athletes has also sought to understand the relationship between motor learning, psychosocial qualities, autonomy, and reasons for sports practice [6, 9, 15, 16]. Furthermore, there are substantial particularities between sexes and age groups that require clarification. For example, there is a tendency for males to be more impulsive than females [16], and younger athletes present less emotional control when they are involved in stressful situations [17], including in the school context [18].

Considering the occurrence of young athletes' psychological instabilities, it is relevant to understand the motivational factors associated with sports practice [3]. This is critical because the adherence and performance of young athletes in competitive sports are related to motivational factors [1, 19]. According to the self-determination theory [20], the reasons that lead to sports practice may be extrinsic or intrinsic. Intrinsic motivation is related to the factors associated with fun and competence for sports [21], whereas extrinsic motivation refers to the factors linked to social behaviour through pressure or external rewards, that is, social aspects, appearance, and health [21, 22]. In fact, motivation assessment enables understanding of the reasons why children and adolescents practise sports, since it clarifies the factors that trigger, regulate, sustain, direct, and interrupt such behaviour [3].

According to the above assumptions, it is well known that the emotional state and pressures experienced by young athletes are marked by psychological vulnerability [9] and later become relevant to sports practice and performance. Thus, understanding how mood, motivation, and impulsivity of youth athletes are manifested as a function of sexes in different age groups has important implications for sports since it would allow interventions compatible with these characteristics. Although the literature has analysed mood, motivational factors, and impulsivity in sports, less is known

about young athletes in this context [4, 9, 23]. Moreover, studies comparing those aspects between the sexes and age groups, as well as analysing these 3 psychometric parameters simultaneously, are still lacking. The present study aimed to compare the mood, motivation, and impulsivity among youth athletes depending on sex and age.

## Material and methods

### Study design

This was a cross-sectional study with youngsters who participated in the regional stage of the Brazilian Youth School Games 2018, held in the city of Joinville (Santa Catarina). The research applied a quantitative, descriptive, and comparative approach that aimed to record, analyse, and describe the subjects' characteristics related to mood, motivation, and impulsivity in a competitive environment depending on sex and age. The athletes were asked to complete questionnaires assessing mood, motivation, and impulsivity.

### Participants

The study involved 147 young athletes (male and female) aged 12–17 years ( $14.53 \pm 1.51$  years) of different team sports (basketball, futsal, handball, and volleyball). Potential participants were randomly approached without prior determination of age and sex. The subjects were divided in accordance with sex and age (with the consideration of the competition rules: athletes aged 12–14 years and athletes aged 15–17 years). Thus, 4 groups were analysed: (1) females  $\leq 14$  years old ( $13.18 \pm 0.87$  years), (2) males  $\leq 14$  years old ( $13.68 \pm 0.47$  years), (3) females  $\geq 15$  years old ( $15.69 \pm 0.74$  years), and (4) males  $\geq 15$  years old ( $16.34 \pm 0.73$  years).

### Instruments

#### *Mood state*

The instrument used was the Brunel Mood Scale. It was adapted from the Profile of Mood States and translated into and validated for Brazilian Portuguese by de Miranda Rohlfs et al. [24]. The Brunel Mood Scale presents a reliability coefficient of 0.76–0.90 and contains 24 indicators that identify feelings of indisposition or disposition, nervousness or non-nervousness, and satisfaction or dissatisfaction. These indicators comprise 6 subscales, of which 5 are related to

negative factors: (a) tension – refers to muscular tension; (b) depression – indicates a feeling of incapacity and depressed mood; (c) anger – reflects irritation and hostility towards others; (d) fatigue – signifies a low level of energy and disposition; (e) mental confusion – characterized by a state of confused mood and lack of mental clearance; and one positive factor, (f) vigour – marked by a high level of energy and disposition. The indicators are related to the question ‘How do you feel now?’ For each question, there is a Likert scale of 5 points: 0 – nothing, 1 – a little, 2 – moderately, 3 – fairly, 4 – extremely. Each subscale contains 5 items and with the sum of the responses from each subscale, a score is obtained that can vary from 0 to 16 [25].

### *Motivation*

The instrument used to evaluate motivation was the Motivation for Physical Activities Measure-Revised (MPAM-R) in its version adapted and validated to the Brazilian Portuguese by Albuquerque et al. [26]. The MPAM-R scale is based on self-determination theory [27] and is comprised of 5 subscales. The pleasure and competence subscales reflect intrinsic motivation, whereas the physical fitness, appearance, and sociability subscales reflect levels of extrinsic motivation. In this context, after adaptation and validation for the Portuguese language, Albuquerque et al. [26], using exploratory and confirmatory factor analysis, suggested the use of the weighted method to calculate the dimension score. The scale of the MPAM-R showed an internal consistency (Cronbach’s alpha) of 0.90, with the specific indices of each factor also considered satisfactory: 0.88 for fun, 0.84 for health, 0.79 for appearance, 0.85 for competence, and 0.75 for sociability.

### *Impulsivity*

Impulsivity was evaluated by using the Impulsive Behavior Scale (Urgency, Premeditation, Perseverance, Sensation – UPPS), in the version translated and adapted to Brazilian Portuguese [28]. The instrument consists of 45 items evaluating 4 factors related to impulsivity: urgency, lack of premeditation, sensation seeking, and lack of perseverance. Urgency refers to a tendency to act impulsively in the presence of negative emotions. Lack of premeditation is characterized by a person’s tendency to make reckless decisions. Sensation seeking implies an individual’s proclivity to engage in exciting activities. Lack of perseverance reflects a difficulty keeping one’s focus on a given task. These personality factors are associated with impulsive behaviour in a Likert-

type format ranging from 1 to 4: 1 – strongly agree, 2 – partially agree, 3 – partially disagree, and 4 – strongly disagree. The internal consistency of UPPS was satisfactory, with Cronbach’s alpha values obtained for all subscales as follows: 0.87 for lack of premeditation, 0.85 for urgency, 0.84 for sensation seeking, and a smaller value, 0.75, for lack of perseverance.

### Statistical analysis

A descriptive analysis of the data was carried out to determine means and standard deviations for each variable. For comparisons between groups, the Kruskal-Wallis test was used. A significance level of 5% was adopted. When the results showed significant differences, pairwise comparisons were conducted by using the Mann-Whitney test with the Bonferroni correction procedure for multiple comparisons. The analysis was performed with the Statistical Package for the Social Sciences (SPSS), version 20.0 (Chicago, USA).

### **Ethical approval**

The research related to human use has complied with all the relevant national regulations and institutional policies, has followed the tenets of the Declaration of Helsinki, and has been approved by the Federal University of Goiás Ethics and Research Committee (approval No.: 16868619.4.0000.5083).

### **Informed consent**

Informed consent has been obtained from all individuals included in this study and their legal guardians.

### **Results**

Table 1 shows the results of comparisons of mood state between sex and age groups. A significant difference was found for the dimensions of anger [ $\chi^2(3) = 11.051$ ;  $p = 0.11$ ], vigour [ $\chi^2(3) = 16.570$ ;  $p = 0.001$ ], and mental confusion [ $\chi^2(3) = 12.654$ ;  $p = 0.005$ ]. Pairwise comparisons showed the following differences in mood state dimensions: the female group  $\leq 14$  years old had a higher score in relation to their male counterparts in the confusion dimension ( $p = 0.009$ ) and in the vigour dimension ( $p = 0.005$ ). Females aged  $\leq 14$  years and males aged  $\geq 15$  years attained higher scores in relation to the female group aged  $\geq 15$  years ( $p = 0.007$  and  $p = 0.001$ , respectively) for vigour.

Comparisons between the categories (sex and age) regarding motivation for the practice of physical activity, physical exercise, and sports are presented in Table 2. A significant difference was detected in the

Table 1. Comparison of mood in the categories analysed

Dependent variables	Categories	Mean	SD	<i>p</i>
Depression	Females ≤ 14 years	2.4	3.25	0.054
	Males ≤ 14 years	0.66	1.28	
	Females ≥ 15 years	1.85	3.53	
	Males ≥ 15 years	0.91	1.77	
Tension	Females ≤ 14 years	5.16	3.57	0.055
	Males ≤ 14 years	3.37	2.48	
	Females ≥ 15 years	3.69	2.6	
	Males ≥ 15 years	3.40	2.75	
Fatigue	Females ≤ 14 years	4.07	4.22	0.141
	Males ≤ 14 years	2.41	2.84	
	Females ≥ 15 years	3.65	3.74	
	Males ≥ 15 years	2.60	3.22	
Anger	Females ≤ 14 years <sup>a</sup>	1.61	2.07	0.011*
	Males ≤ 14 years	0.61	1.39	
	Females ≥ 15 years	1.81	3.75	
	Males ≥ 15 years	1.20	2.84	
Vigour	Females ≤ 14 years <sup>b</sup>	8.48	4.09	0.001*
	Males ≤ 14 years <sup>b</sup>	7.76	3.7	
	Females ≥ 15 years <sup>c</sup>	5.35	2.94	
	Males ≥ 15 years	9.31	4.11	
Mental confusion	Females ≤ 14 years <sup>d</sup>	1.80	1.92	0.005*
	Males ≤ 14 years	0.73	1.47	
	Females ≥ 15 years	1.08	1.96	
	Males ≥ 15 years	1.03	1.85	

\* significant difference ( $p < 0.05$ )

<sup>a</sup> significant difference from males ≤ 14 years

<sup>b</sup> significant difference from females ≥ 15 years

<sup>c</sup> significant difference from males ≥ 15 years

<sup>d</sup> significant difference from females ≤ 14 years

health dimension [ $\chi^2(3) = 8.584; p = 0.035$ ]. Pairwise comparisons showed that males aged ≥ 15 years obtained a higher score in relation to both female groups: ≤ 14 years ( $p = 0.028$ ) and ≥ 15 years ( $p = 0.011$ ).

In the analysis of impulsivity (Table 3), significant differences were detected for lack of perseverance [ $\chi^2(3) = 14.667; p = 0.002$ ] and lack of premeditation [ $\chi^2(3) = 13.389; p = 0.004$ ]. Pairwise comparisons evidenced differences for lack of perseverance: both female groups (≤ 14 years and ≥ 15 years) had a higher score in relation to the male group ≤ 14 years ( $p = 0.003$  and  $p = 0.034$ , respectively); and lack of premeditation: the female groups aged ≤ 14 years and ≥ 15 years presented a higher score in relation to the male group ≤ 14 years ( $p = 0.012$  and  $p = 0.013$ , respectively).

Table 2. Comparison of reasons for the practice of physical activity, physical exercise, and sports in the categories analysed

Dependent variables	Categories	Mean	SD	<i>p</i>
Fun	Females ≤ 14 years <sup>a</sup>	5.74	0.84	0.448
	Males ≤ 14 years	5.78	1.33	
	Females ≥ 15 years	5.80	0.92	
	Males ≥ 15 years	5.89	1.14	
Competence	Females ≤ 14 years <sup>a</sup>	6.37	0.67	0.597
	Males ≤ 14 years	6.02	1.37	
	Females ≥ 15 years	6.11	0.83	
	Males ≥ 15 years	6.14	1.07	
Appearance	Females ≤ 14 years <sup>a</sup>	5.36	1.01	0.123
	Males ≤ 14 years	5.46	1.32	
	Females ≥ 15 years	5.35	1.07	
	Males ≥ 15 years	5.79	1.19	
Health	Females ≤ 14 years <sup>a</sup>	4.38	1.52	0.035*
	Males ≤ 14 years	4.89	1.56	
	Females ≥ 15 years	4.55	1.11	
	Males ≥ 15 years	5.20	1.28	
Social	Females ≤ 14 years <sup>a</sup>	5.66	0.93	0.899
	Males ≤ 14 years	5.43	1.38	
	Females ≥ 15 years	5.69	0.99	
	Males ≥ 15 years	5.72	1.11	

\* significant difference ( $p < 0.05$ )

<sup>a</sup> significant difference from males ≥ 15 years

Table 3. Comparison of impulsivity state in the categories analysed

Dependent variables	Categories	Mean	SD	<i>p</i>
Lack of perseverance	Females ≤ 14 years <sup>a</sup>	21.02	5.81	0.002*
	Males ≤ 14 years <sup>b</sup>	16.88	3.26	
	Females ≥ 15 years	20.65	5.61	
	Males ≥ 15 years	18.77	5.86	
Urgency	Females ≤ 14 years	24.36	6.46	0.122
	Males ≤ 14 years	28.49	11.77	
	Females ≥ 15 years	23.46	9.42	
	Males ≥ 15 years	24.29	10.39	
Lack of premeditation	Females ≤ 14 years <sup>a</sup>	22.61	7.87	0.004*
	Males ≤ 14 years <sup>b</sup>	17.71	4.91	
	Females ≥ 15 years	22.96	6.84	
	Males ≥ 15 years	20.71	7.87	
Sensation seeking	Females ≤ 14 years	28.93	9.19	0.731
	Males ≤ 14 years	31.17	10.97	
	Females ≥ 15 years	28.42	9.93	
	Males ≥ 15 years	29.94	10.97	

\* significant difference ( $p < 0.05$ )

<sup>a</sup> significant difference from males ≤ 14 years

<sup>b</sup> significant difference from females ≥ 15 years



## Discussion

The aim of the present study was to compare the scores of mood, motivation, and impulsivity in young athletes participating in the Brazilian Youth School Games 2018, with the consideration of their sex and age. The results showed important differences in mood state between sex and age. Female athletes aged  $\leq 14$  years demonstrated higher levels of anger and confusion compared with males  $\leq 14$  years old. In the vigour dimension, higher scores were observed for females  $\leq 14$  years and males  $\geq 15$  years compared with females  $\geq 15$  years. These results corroborate the study by Neal et al. [4], who evaluated high school students aged 13–18 years and found mood disorders in 14.3% of the investigated adolescents. The authors also found that mood instability was more prevalent in young and female athletes. This probably happens because they have greater difficulty dealing with psychological and emotional pressures caused by various aspects, such as intense training routine, adverse situations, and conflicts in a competitive environment [8, 9].

Another possible justification for the greater emotional instability in females and young people can be that puberty is marked by several biological transformations that affect the individuals' psychological and emotional status. According to Chipkevitch [29], puberty is a period of biological maturation with the typical appearance of secondary sexual characteristics, growth spurt, and changes in body composition. However, it occurs at different times for females and males: puberty begins between 11 and 12 years in girls and between 12 through 14 years in boys. Adolescents may be at different stages for each characteristic since their maturation obeys different hormonal and genetic mechanisms. Although these biological transformations are universal, they seem to influence the psychological status of adolescents and the people around them.

The analysis of reasons leading to engaging in sports activities showed that male athletes  $\geq 15$  years presented higher scores in the health dimension when compared with female groups. Our results disagree with previous studies [19, 21] that found intrinsic motivation, especially fun and pleasure, to be determining factors for participation in and adherence to sports activities [21]. Other studies investigating soccer players revealed that younger athletes were motivated to practise from the social dimension [19], whereas older competitors were motivated to practise within the dimensions of health and competence. In addition, previous studies have demonstrated that younger athletes are intrinsically motivated, while older ones are

extrinsically motivated [19, 27]. Probably, such differences between our findings and those of previous research are due to discrepancies in age, sports modality, practice time, and competition experience, as well as protocols, population, measures, and type of analysis [27].

Regarding impulsivity, the results indicated that females showed a greater lack of perseverance and forethought than their male counterparts. Female athletes have less persistence in tasks and less capacity to understand and think about the consequences of an act before performing it (showing greater impulsivity during the competitive period). The results disagree with the literature reporting that men tend to be more impulsive than women and, as well, that the younger the individual, the lower their impulsivity [16]. However, it is possible that young male athletes acted more in search of sensation than female athletes, which suggests that they tend to experience impulses that can generate negative effects [17].

This study has some limitations that should be highlighted, such as not considering mood, motivation, and impulsivity depending on the athletes' performance in competition. Thus, it is suggested that future investigations analyse how performance may alter these psychological parameters. It would be helpful to conduct longitudinal studies to identify potential changes in these parameters depending on the experience of young athletes. Another possible limitation was the analysis of maturation as described by Tanner. Maturation is a biological phenomenon inherent to human beings that acts in conjunction with environmental factors owing to its relationship with development (or that may influence the results related to mood and impulsivity states) [25]. Therefore, it is suggested that research be conducted on the effects of physiological adaptations that require the practice of systematic training and the process of growth and development towards the maturity of young athletes. This can assist in identifying the effect of training on the impact of the maturation process [25].

## Conclusions

Our findings indicate that the mood, motivation, and impulsivity of young athletes have varying characteristics in males and females and in different age groups. Younger female athletes ( $\leq 14$  years) appear to demonstrate greater mood instability compared with males of the same age. In addition, female athletes  $\geq 15$  years presented less energy and disposition than female athletes  $\leq 14$  years and males  $\geq 15$  years. Re-

garding motivation, health seems to be the most predominant factor among older male athletes ( $\geq 15$  years) compared with female competitors. As for impulsivity, young female athletes appear to be more susceptible to impulsive behaviour. During the process of sports development and professional practice with young athletes, these results should be considered as a whole by coaches and teachers aiming at positive interventions into psychological factors such as mood, motivation, and impulsivity regulation.

#### Practical applications

Diagnosing what motivates the young athlete is essential. The athlete should obtain positive reinforcement concerning aspects related to the technical or tactical evolution in sport, demonstrating that factors related to competence (intrinsic factors) are important for sports practice. On the other hand, aspects related to appearance (extrinsic factors), such as those associated with aesthetics, should not be reinforced. It is up to the teacher/coach to find attractions and strategies to ensure meaningful learning for the student. When considering aspects related to emotion, it is relevant that students, athletes, or student-athletes maintain a positive mood during classes, training sessions, and championships. Factors related to the state of mood, such as tension and anger, must be worked on in classes or training sessions; indeed, it is necessary to teach strategies to know how to deal with these emotions and control them. It is also necessary to show the need to maintain the highest vigour, for example, reinforcing sports practice that increases the energy and disposition for daily physical and sporting tasks. In addition, the possibility of seeking help and partnerships with professionals in the field of psychology should be considered to guide and give lectures on self-control, self-confidence, depression, and ways of dealing with frustrations in the face of adverse results, among others. In relation to impulsiveness, teachers need to propose clear and objective activities in order for the athletes to maintain greater attention and concentration on the proposed tasks, for example, through the performance of new and challenging activities. Generally, students have difficulty in controlling their impulsivity in such situations as waiting their turn, staying focused, and predicting their opponent's movements. Thus, the teacher/coach should plan classes that allow these factors related to impulsivity to be mitigated and controlled.

#### Disclosure statement

No author has any financial interest or received any financial benefit from this research.

#### Conflict of interest

The authors state no conflict of interest.

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