Original Article

MOTIVATIONAL PROFILE AND EMOTIONAL INTENSITY IN SCHOOL BASKETBALL: PREDICTOR VARIABLES

ORIENTAÇÃO MOTIVACIONAL E INTENSIDADE DAS EMOÇÕES NO BASQUETEBOL ESCOLAR: VARIÁVEIS PREDITORAS

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RESUMO

Este trabalho investigou a capacidade preditiva das características do jogo e dos protagonistas para predizer a intensidade das emoções, assim como a orientação motivacional (para o rendimento ou resultado final) dos participantes. Participaram 183 estudantes de ensino fundamental e ensino médio de quatro regiões espanholas (meninos = 43.7 % e meninas = 56.2%), faixa etária de 12 a 17 anos. Se realizaram 2 sessões de intervenção de 60 minutos (15-20' por jogo), a intensidade emocional foi avaliada ao final da sessão mediante o questionário GES e os perfís motivacionais foram avaliados com o questionario BREQ3. Para a análise dos datos foi utilizada a técnica denominada árvores de clasificação CHAID. Entre os resultados destaca-se que: a) o resultado da competição e o tipo de jogo podem predizer a intensidade emocional dos participantes; b) o resultado durante o jogo e o gênero podem predizer os perfís motivacionais orientados ao rendimento; c) o gênero e o resultado, além do histórico esportivo ajudam a predizer os perfís motivacionais que não estão orientados ao rendimento.
Palavras-chave: Basquetebol. Motivação. Interação motriz. Intensidade emocional. Competição.

ABSTRACT

This research investigated the capacity that game characteristics and protagonists have to predict emotional intensity, as well as motivational orientation (towards performance or outcome). A total of 183 elementary and high school students from four Spanish regions joined the study (boys = 43.7% and girls = 56.2%), aged 12 to 17 years old. Two 60-minute intervention sessions were carried out (15-20' per game); emotional intensity was assessed at the end of the session using the GES, whereas motivational profiles were assessed through the BREQ3. For data analysis, the decision tree technique known as CHAID was employed. The findings allow highlighting that: a) competition result and game type can predict the participants' emotional intensity; b) result during the match, along with gender, can predict performance-oriented motivational profiles; and c) gender and result, in addition to sports background, help predict motivational profiles not oriented to performance.
Keywords: Basketball. Motivation. Motor interaction. Emotional intensity. Competition

Introduction

Basketball as a formative activity during physical education classes allows one to develop tasks of different sorts, according to the intended goal. These motor tasks proposed by physical education teachers are sometimes not very attractive to students. However, what determines motivation and affective experiences during a basketball class?

To answer this question, one must consider that there are different variables related to the characteristics of the game and of the students that condition motivational profile and emotions during a physical education class, in this case, a basketball class.

Concerning game characteristics or motor tasks, it is worth highlighting that each one has characteristics or an internal logic[1] that distinguishes it from the others, such as the type of motor interactions of the game or of the task, presence or absence of competition, practice spaces, or materials used; thus, depending on these characteristics, the effects to be produced on participants will be different[1]. From the theory of motor action, in compliance with the motor interaction criterion, tasks or games can be classified into four major domains: a) psychomotor games, which lack motor interaction among participants, that is, there is no person opposing or collaborating as to goal achievement; b) cooperation games, in which

motor interaction is oriented towards reaching a common goal; c) opposition games, in which motor interaction is oriented towards preventing a goal to be reached; and d) cooperation-opposition games, in which motor interactions in a group of people are oriented to cooperation and achievement of a common goal, while another group is opposed to this goal[1].

Out of these families, psychomotor and cooperation games deserve special attention due to the effects they cause on participants[2,3]. On the one hand, psychomotor games correspond to practices whose difficulty requires participants to cover distances, jump obstacles, control their bodies in unusual situations or manipulate objects; in basketball, initially, psychomotor activities are used for identifying technical strengths and limitations, besides being widely used in warm-up phases with exercises such as running with dribbling, aiming for the basket, or shooting execution, for one to achieve response automation[1,4]. Whereas cooperative games orient participants towards mutual help, for them to share a positive motor interaction that activates group pact, shared strategies, interpersonal relationships, generosity, empathy and sacrifice for others[5-7].

According to the science of motor action, another characteristic of internal logic that distinguishes the proposed tasks is competition, associated with success and failure criteria that identify the participants' victory and defeat[8]. Although other theoretical approaches consider that, if there is competition, an activity cannot be considered cooperative, the theoretical foundation of the motor action science precisely establishes the types of motor interaction that indicate types of practice. Thus, a cooperative game, which implies that its participants share motor interactions of cooperation, will continue to be cooperative, whether or not there is competition, as long as these interactions continue to be cooperative. That is, there will be no opponents that prevent players from carrying out cooperative motor actions. The internal logic of competitive tasks requires participants to manage the emotional snap that causes competitive confrontation[1], generating an uneven emotional experience among those who achieved victory and those who did not[6]. Nevertheless, the almost exclusive use of competition in educational and training contexts may cause the atmosphere within sessions to be critical for the experiencing of positive emotions during motor practice, especially for women[9].

With respect to the characteristics of participants, gender is a fundamental aspect to bear in mind during physical education classes and, therefore, in basketball classes as a formative activity. At the emotional level, previous studies have observed that, when participating in different types of games, men experience more intense emotions than women do[6], as well as different mood states[10]. This emotional behavior is pronounced with defeats in competitive matches, in which men express negative emotions more intensely than women do[6]. Concurrently, as for the participants' motivational profiles, some studies have highlighted differences that exist between genders, according to which boys tend to be more ego-oriented than girls, while the latter seem to be more task-oriented[11,12].

Likewise, previous experiences, such as the sports background of each participant, may condition the latter to emotions experienced during a match or task, meaning that, depending on their sports experience, each person perceives and reacts differently to the same motor situation, acting according to their cognitive abilities and attributing meanings according to their own interpretation of this experience[1,4]. Thus, it seems rational to think that, depending on whether or not there is a sports background, and on competition experience, the emotional meaning of each played match is likely to be different[6,13], and so are the motivational profiles[14].

At a motivational level, it is necessary to know that there are different dispositional and situational factors that condition the motivational objectives and emotional intensities of participants during practice[8]. The dispositional factor refers to the personal characteristics of each individual, which will orient one towards the task or towards the ego, and by means of

which, at the margin of the situation or of the context, the affective states and the behaviors of participants are determinant; while situational criteria refer to the characteristics of the environment in which the individual is, which can affect the likelihood of them adopting a particular state of involvement in the activity[8,15-17].

Thus, when the student's goal during a session is determined by dispositional factors and is oriented towards the task learning process (e.g., great technical executions in shoots or passes), positive attitudes are generated towards the class, fun and pleasure. On the contrary, when the goal is oriented towards performance or the ego (e.g., be faster than teammates, score as many points as possible), motivation is associated with the belief that the task is a means to an end, considering that success is achieved through comparison, social approval, conquest of external rewards and status in society, which thus generate negative attitudes[8].

This knowledge will help physical education teachers to correctly select motor tasks or games based on motivational profiles and on the effects that motor games cause on participants in order to allow for the participants' comprehensive formation.

Supported by this theoretical framework, this study intends to explore the strength of game characteristics (individual or cooperative; victory or defeat) and protagonists' characteristics (gender and sports background) to predict the intensity of positive and negative emotions, as well as to predict the motivational orientation (towards performance or outcome) of participants during a basketball session in a physical education class.

Method

Participants

The study counted with 183 elementary and high school students from four Spanish regions (Andalusia, Catalonia, Canarias and Murcia). The sample totaled 80 boys (43.7%) and 103 girls (56.2%), aged between 12 and 17 years old, 42% of which had a sports background, and 58% did not.

The participants attended all intervention sessions and performed the same intervention protocol during their regular physical education classes. Moreover, all of them, before the beginning of the sessions, handed in a document stating their parents' consent on them joining this pedagogical experience. In addition, this investigation was approved by the Ethics Committee of the University of Lleida (CEIC 166/2011).

Instruments

To assess the participants' emotional intensities, motivational profiles and sports background, different questionnaires were used, which were filled out at the beginning and at the end of the session. Emotional intensity was assessed through the GES17, in which they should indicate (from 0 to 10) the emotional intensity of positive and negative emotions they had experienced while playing. The GES has the following psychometric properties: acceptability was studied by means of asymmetry tests (below 2.0) and kurtosis tests (below 7.0); internal consistency was assessed through Cronbach's alpha scale; overall, the GES provided, as values , n = 851; $\alpha = 0.92$, and for each type of emotion, the results found were: positive emotions ($\alpha = 0.92$), negative emotions (a = 0.88), and ambiguous emotions (a = 0.93). The construct validity confirmed the factorial structure of the questionnaire in the three types of emotions and showed the need to distinguish the 4 domains of motor action. Confirmatory factor analysis showed the following goodness of fit indexes in: a) psychomotor domain: Chi-squared ratio on degrees of freedom (CMIN/df). = 7.014, normed fit index (NFI) = .813, incremental fit index (IFI) = .836, comparative fit index (CFI) = .833, root mean square error of approximation (RMSEA) = .08 (LO90 = .072 - HI90 = .09); factor weights ranged between .50 for sadness and .77 for joy, and all weights were significant (p <.05); b)

cooperation domain: CMIN/df. = 3.041, NFI = 0.926, IFI = .949, CFI = .948, RMSEA = .049 (LO90 = .041 - HI90 = .057); factor weights ranged between .42 for wrath and .83 for anxiety, and all weights were significant (p <0.05); c) opposition domain: CMIN/df = 3.97; NFI = .889, IFI = .915, CFI = .914, RMSEA = .059 (LO90 = .051 - HI90 = .067); factor weights ranged between .47 for fear and .81 for joy, and all weights were significant (p <.05); and d) cooperation-opposition domain: CMIN/df = 3.6, NFI = .906, IFI = .93, CFI = .929; RMSEA = .055 (LO90 = .048 - HI90 = .063); factor weights ranged between .44 for compassion and .89 for joy, and all weights were significant (p <.05). Convergent validity was assessed through Pearson's correlation coefficient and presented good results comparing the GES and the Profile of Moods States (POMS) questionnaire. Content validity, assessed through evaluation by 12 judges, confirmed that the GES structure is adequate for studying the relationship between sports games and emotions. In conclusion, the questionnaire showed its validity and reliability for recording the intensity of emotions as to practice of motor games.

Motivational profiles were examined using the BREQ-3[18]. For the participants to provide their sports background or experience, they indicated in a questionnaire which sports they were currently playing, for how long, and their competitive level. BREQ-3 has the following psychometric properties: the model results have the following goodness of fit indexes: χ^2 (215, N = 524) = 689.13, p = .00; χ^2 / df = 3.20; CFI = .91; IFI = .91; RMSEA = .06; SRMR = .06. The standardized regression weights of the items ranged between .52 and .86, being statistically significant (p <.001), and satisfactory errors of variance were obtained. Correlations among the six factors ranged between -.34 and .77. The analysis of internal consistency revealed Cronbach's alpha values of .87 for intrinsic regulation, .87 for integrated regulation, .66 for identified regulation, .72 for introjected regulation, .78 for external regulation, and .70 for demotivation. To give the integrated regulation variable criterion validity, a linear regression analysis was run, which allowed verifying whether the three basic psychological needs positively and significantly predicted such regulation, in line with the principles of the self-determination theory. Results revealed that the satisfaction of competence needs (β = .39) and autonomy needs (β = .13) positively and significantly predicted integrated regulation, with corrected R2 = .25.

Procedures

Before the intervention, an emotion training session was held, the conditions for participation were explained, and the instruments were presented; this session lasted 1.15 minutes. After familiarization with the instruments, 2 sessions were held (one for each type of game), lasting 60 minutes (15-20' per game). The GES was applied at the beginning of the session (pre-test) and at the end of the last game of each session (post-test).

The games played were: a) Psychomotor game: racing. Two players stood on a start line. At the signal, each player should lead a basketball through an established course and distance, alternating both hands. Whoever completed the course in the shortest time possible won; b) Cooperative game: pass and win. Split into groups of 6 players, each group passed 3 balls simultaneously for as long as possible without letting the ball fall. When the opponent team's ball fell, the other team scored one point. The team with the most points won.

Statistical Analysis

The decision tree technique known as CHAID[19] was used; different trees were generated with the application of: a) Pearson's chi-squared test, b) a cross-validation system, c) level of prolonged interactions until considering 50 as the minimum number of cases at terminal levels, and 100 cases at main levels, and d) statistical significance (p <.05). The statistical software SPSS v.24 was used.

The predictor variables for the motivational profile were:

a) Emotion type: Whether the prevalence of emotions was positive (joy) or negative (sadness, fear, anger or wrath)
b) Motor interaction type: Psychomotor (no interaction) and cooperative (motor interaction to achieve a common goal)
c) Competition: Psychomotor and cooperative games with competition (win, lose)
d) Students' gender (woman, man)
e) Sports background (sports experience, no sports experience)

The predictor variables for emotional intensity were:

a) Motor interaction type: Psychomotor (no interaction) and cooperative (motor interaction to achieve a common goal)
b) Competition: Psychomotor and cooperative games with competition (win, lose)
c) Students' gender (woman, man)
d) Sports background (sports experience, no sports experience)

Results

Decision trees with the predictor variables of emotional experiences will be presented first (Figure 1), followed by decision trees corresponding to ego-oriented motivational profiles (Figure 2) and to task-oriented motivational profiles (Figure 3).

To determine the predictor variables of intensity of emotional experiences, according to the hierarchical order of the decision trees (Figure 1), the first predictor variable was emotion type ($p < .001$; $F = 1142.9$; *df1*, *df2* = 1848). Positive emotions (level 1, $n = 370$, $M = 4.23$) were more intense than negative ones (level 2, $n = 1480$; $M = 1.42$); in both cases, the variable that determined emotion type (second predictor variable) was competition result ($p < .001$).

The intensity of positive emotions was greater for winning (level 4, $n = 214$; $M = 4.83$) compared to losing (level 3, $n = 156$; $M = 3.40$); in addition, the intensity of negative emotions was greater for losing (level 5, $n = 624$; $M = 1.70$) compared to winning (level 6, $n = 856$; $M = 1.24$). The third variable was game type ($p < .005$). Cooperative games caused greater intensity in positive emotions both for losing (level 8, $n = 77$; $M = 3.84$) and for winning (level 10, $n = 109$; $M = 5.11$), compared to psychomotor games (losing: level 7, $n = 79$, $M = 2.97$; winning: level 9, $n = 105$, $M = 4.54$). The players experienced greater intensity of negative emotions when they lost cooperative matches (level 12, $n = 308$; $M = 1.91$).
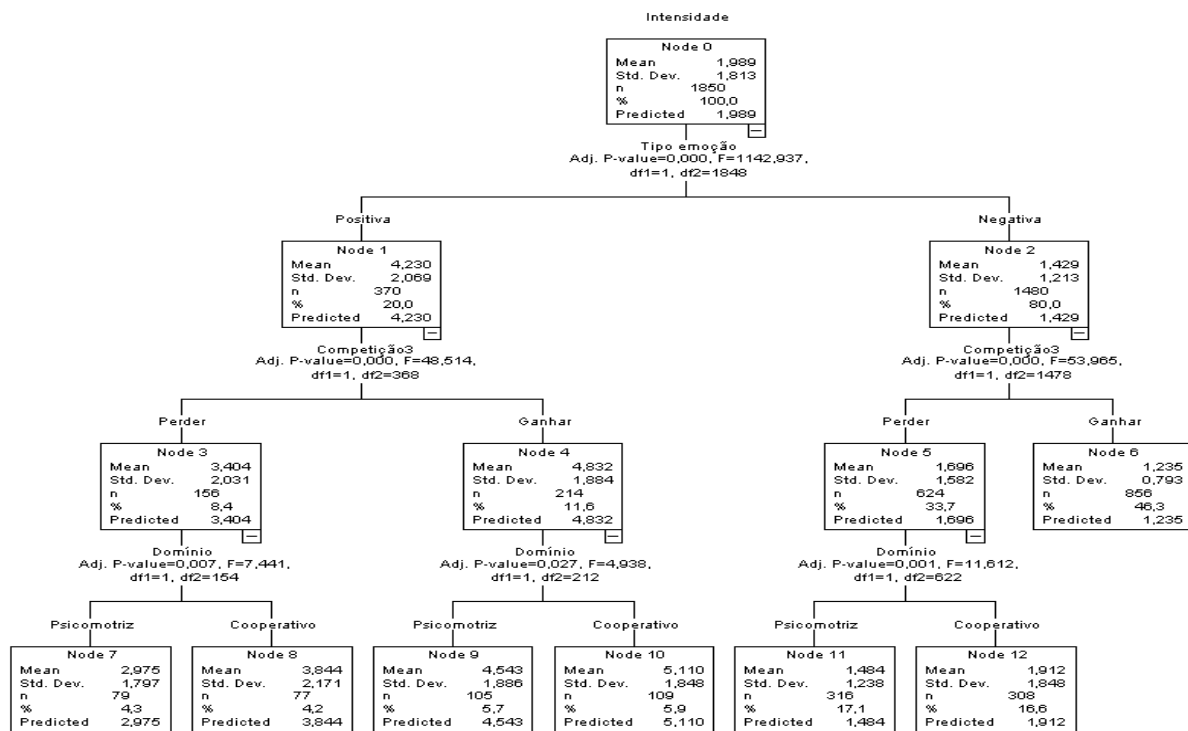
Figure 1. Hierarchical order of predictor variables of emotional intensity during a physical education basketball class

Source: The authors

When predicting the motivational profiles of performance-oriented students (Figure 2), it was possible to observe that sports background was the first predictor variable ($p < .001$; $F = 58.033$; $df1$, $df2 = 1848$). When the participants had sports experience, their goals were more oriented towards performance (level 2, $n = 780$; $M = 23,859$) compared to when they did not have it (level 1, $N = 1070$; $M = 21.64$).

The second predictor variable was task result ($p = .007$; $F = 7,188$; $df1$, $df2 = 778$); when they won (level 6, $N = 460$; $M = 24.36$), the participants attributed greater importance to the result compared to when they lost (level 5, $n = 320$; $M = 23.14$). When they won, the next predictor variable was gender, with boys attributing greater importance to winning (level 7, $n = 315$; $M = 24,778$) compared to girls (level 8, $n = 145$; $M = 23.448$). When the participants lost, no more predictor variables were found that would allow determining goal orientation towards performance.

When they had no sports background, gender ($p < .001$; $F = 10.416$; $df1$, $df2 = 1068$) was the next predictor variable to determine goal orientation towards performance, especially among men (level 3, $n = 355$; $M = 22.49$), whose values were higher than those of women (level 4, $n = 715$; $M = 21.21$).
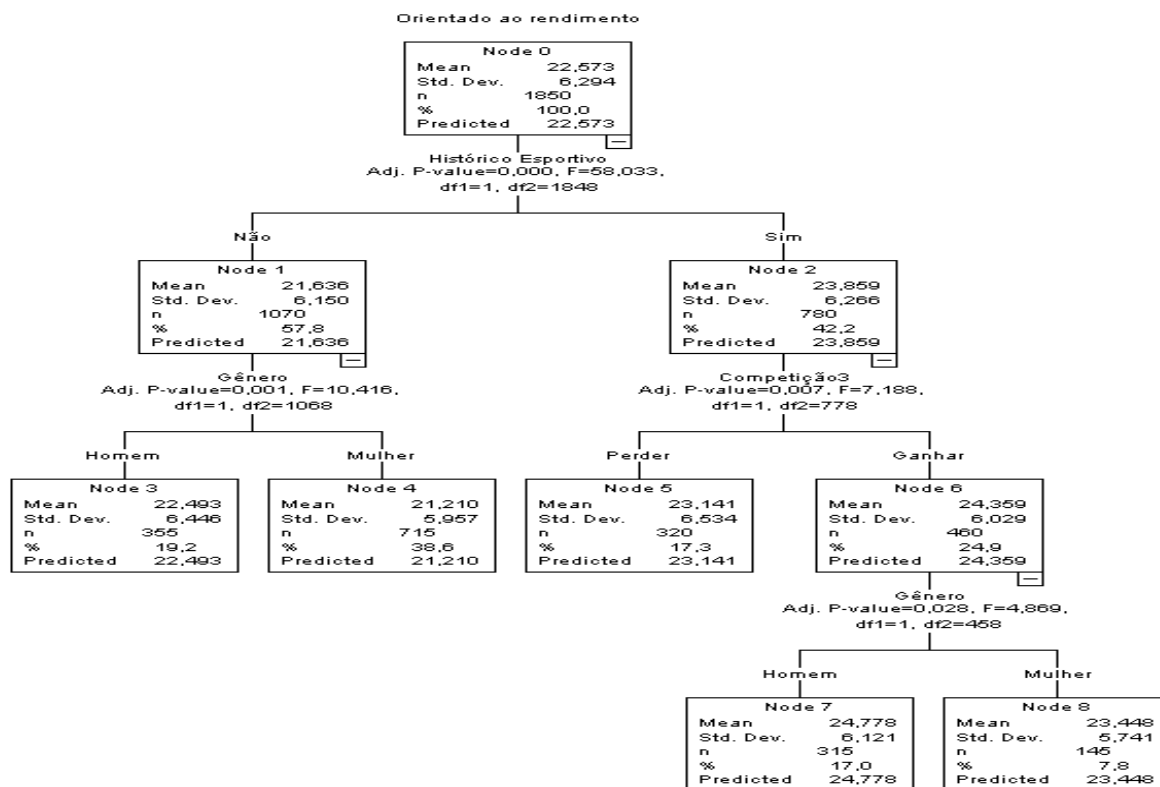
Figure 2. Hierarchical order of predictor variables of performance-oriented motivational profiles in a physical education basketball class

Source: The authors

When predicting motivational profiles not oriented to performance (Figure 3) but to the task, it was possible to observe that gender was the first predictor variable ($p < .001$; $F = 38,802$; $df1$, $df2 = 1848$), with girls showing greater preference for proving their competence in the task (level 2, $n = 1035$; $M = 19.319$) compared to men (level 1, $N = 815$; $M = 17.571$).

In the case of boys, the second predictor variable was result ($p = .019$; $F = 5,509$; $df1 = 1$, $df2 = 813$), whose values were higher when they won (level 4, $n = 530$; $M = 17.915$) compared to when they lost (level 3, $n = 285$; $M = 16.930$). Regardless of results, the third predictor variable was sports background; when losing, boys with no sports background (level 7, $n = 140$; $M = 18.50$) showed a greater preference for the task than those with sports experience did (level 8, $n = 145$; $M = 15.41$); when they won, the opposite occurred, that is, the participants with sports background had a greater preference for the task (level 10, $n = 315$; $M = 19.048$) compared to those who did not have sports background (level 9, $n = 215$; $M = 16.25$).

The second predictor variable in the case of girls was also result ($p < .001$; $F = 11.59$; $df1 = 1$, $df2 = 1033$), with higher values when losing than when winning. When girls lost, the third predictor variable was game type ($p = .003$; $F = 9.206$; $df1 = 1$, $df2 = 493$), with higher values in cooperation games (level 12, $n = 215$; $M = 20.95$) compared to psychomotor games (level 11, $n = 280$; $M = 19.27$).
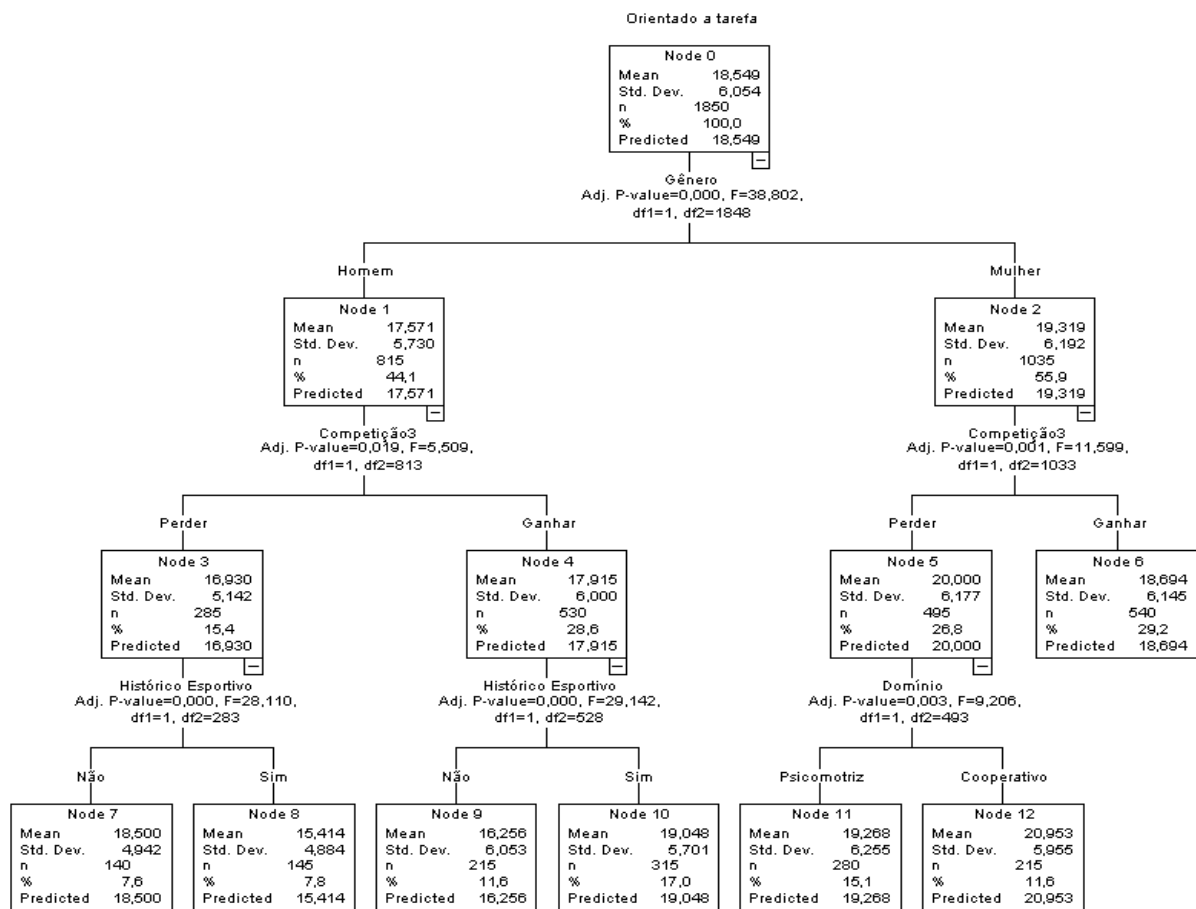
Figure 3. Hierarchical order of predictor variables of task-oriented motivational profiles in a physical education basketball class.

Source: The authors

Discussion

The objective of this study was to analyze the strength of game characteristics (individual or cooperative; victory or defeat) and protagonists (gender and sports background) to predict the intensity of positive and negative emotions, as well as to predict the motivational orientation (towards performance or outcome) of participants during a basketball session in a physical education class.

Results show the effect of game characteristics on the participants' emotional intensity, which changes as a function of game type and achieved outcome[2,20]. It is worth noting that, during basketball sessions in physical education classes, the type of exercise proposed and the presence or absence of competition generated different effects on the participants' emotional states, as shown in previous studies, in which the valence of emotions are conditioned by the result of the activity, that is, those cases in which the result was not expected, the emotions experienced were negative, but in those in which the result was positive, positive emotions were more intense[6,10]. Therefore, physical education teachers should propose different types of activities that allow students to experience different types of emotions, and thus allow everyone to have the opportunity to enjoy victory and learn from defeat[15], promoting a comprehensive training[1].

In addition to the effect of task results favoring positive emotions, the motor relationships that arise during the game also play a determining role. Apparently, the participants prefer to perform exercises that require interaction with other people, in this case,

cooperate towards achieving a common goal, which thus confirms the findings of other studies that highlight the benefits of cooperative tasks to favor affective well-being, since the internal logic of this type of task leads participants to help each other, to share a positive motor interaction that activates group pact, shared strategies, interpersonal relationships, generosity, empathy and sacrifice for others[5,21,22].

However, one must consider the number of cooperative tasks to be proposed during basketball sessions, because, although they are tasks that generate positive emotions in the participants, these could also generate negative ones. At the same time that psychomotor games generated less intense positive emotions, they also generated less intense negative emotions, a situation that favors the use of this type of task in basketball sessions since, at an emotional level, it does not bring about an imbalance for players[2,3].

When motivation was determined by performance, it seems coherent that those players who have a sports background are inclined towards these goals, since during practice they are being constantly evaluated based on their results and constantly exposed to social comparison; therefore, the individual judges their ability in relation to others, with success or failure depending on the subjective evaluation that results from comparing one's own ability with that of others[8]. These participants probably see sports as a means to be socially approved and raise their popularity, and when this happens, there are generally very low rates of intrinsic motivation in relation to the activity itself[23].

However, boys with a sports background also showed high values for task learning, which implies an increased interest in the task, a concern about learning, about following the rules, about working hard and enhancing their own sport skills, with success being perceived as personal progress when mastery is shown, and effort being conceived as the main cause of success[16,23]. Some investigations indicate that, when this happens, the activity is perceived as something that strengthens one's capacity for cooperation, social responsibility and intrinsic motivation[12], as well as positive affective feelings[24].

This situation, in which the orientation of motivations in boys was towards performance and task, may be due to the characteristics of the environment where practice was developed, which was capable of changing the participants' level of involvement[8,16] and motivating them to enjoy the learning process during the task and to show their competence in it.

In cases in which the participants had no sports background, men were more concerned about their performance in the task or their ego, confirming once again the social stereotypes in the world of physical activity and sports, where men prefer those tasks in which they can compete and demonstrate their skills[11,12,17], compared to girls, who showed more competence in the task and not in their performance, especially when it comes to cooperative tasks, regardless of results, with the main goal being enjoyment[6].

Conclusions

This study confirms the explanatory capacity of game type variables based on motor interaction (psychomotor or cooperative) and result to predict the intensity of positive and negative emotions, as well as the participants' motivational orientation towards the task (process) or towards performance (result), in physical education sessions. Physical education teachers can use motor basketball situations that require cooperation and in which all participants have the possibility to experience: a) success, for favoring positive emotions and, b) defeat, so that they learn to manage the negative emotions that arise as a consequence; furthermore, physical education teachers could make constant use of psychomotor games in basketball, since they generated emotional intensities for both types of emotions.

For a global interpretation of affective and motivational experience, one must also consider other predictor variables related to the characteristics of protagonists (gender and sports background), because, depending on how they interact with each other, players will have a different motivational profile; for instance, girls with sports experience have a motivational profile oriented to performance (result), while those who do not have it are more task-oriented (process).

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