CORRELATIONS BETWEEN COACHING BEHAVIOR, MOTIVATIONAL CLIMATE AND INTRINSIC MOTIVATION IN CADET BASKETBALL PLAYERS

Miroljub Ivanović[1] and Uglješa Ivanović [2]

[1]Serbian Academy of Innovation Sciences, Belgrade, Serbia,
[2]Telecom Serbia, a.d. Belgrade, Serbia

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Abstract
Aim:The aim of this research is the empirical study of coach's social contribution to intrinsic motivation of cadet basketball players. The research included the pertinent sample (N = 114) of participants from five basketball clubs from Valjevo. The average age of participants was 15,36 years. **Methods:** The following measuring instruments were used: The Leadership Scale for Sports questionnaire (LSS), Negative Coaching Behavior Questionnaire (UNPT), Perceived Motivational Climate in Sport Questionnaire (PMSCQ), and The Intrinsic Motivation Inventory (IMI). **Results:** The obtained results indicate that there are 2/3 of bivariate correlations between the examined variables in adolescent basketball population. The applied hierarchical analysis included the variables coach's positive and negative actions in the first predictor group, and mastery-oriented motivational climate in the second. The regression equation accounted for 30% of the variability of the scores on the criterion variable intrinsic motivation, where coach's negative actions are revealed as significant negative predictor variable, while the mastery-oriented motivational climate was a positive predictor of the criterion. **Conclusion:** The possible explanations and implications were discussed in this research. The obtained results indicate that the examined variables are relevant for understanding and predicting intrinsic motivation in adolescent basketball players.
Key words: leadership in sport, young basketball players, subscale interests, coaching behavior

INTRODUCTION

Basketball is one of the most dynamic sports, where motivation plays a relevant role in the specification equation. It is characterized by constant competition between two teams of players in a relatively small space. As a team sport, and because if its social dimension, it has a positive effect on various psychosocial results for players during adolescence (Chang et al., 2020).

While examining *coach's behavior*, the researchers were predominantly oriented towards positive manifestations and skills which athletes use in order to increase the probability of realizing athletic success (Fox et al., 2020). While researching specific positive manifestations of coaches (training and instructions, democratic coaching, social support and positive feedback), the research authors (Christensen et al., 2021) have determined that those variables correlate. In addition, the authors (Cho et al., 2021) have found positive intercorrelations between coach's characteristic positive behaviors and mastery-oriented motivational climate. Another study (Martín et al., 2018) has also shown positive interaction between the constructs democratic coaching and mastery-oriented motivational climate. In their study, the authors (Romualdas et al., 2021) have found negative correlation between the variables autocratic behavior and mastery-oriented motivational climate with young basketball players, as well as the positive correlation between specific coach's behavior and result orientation. The same authors have also reported that coaches whose leadership style that is characterized by the low level of autocratic actions, frequent positive reinforcement and informative positive feedback, with low frequency of disregarding success or failure of cadet basketball players, can generate the environment that will contribute to the development of athlete's intrinsic motivation.

The research (Trbojević, J., & Petrović, J. (2022)) has noted a positive correlation between intrinsic motivation and democratic coaching, positive feedback, and negative interaction with a coach who exhibits autocratic behavior. The authors (Gardne et al., 2016) have determined that the higher level of autocratic coaching doesn't have the positive effect

on adolescent athletes' perception of autonomy, but that motivational and informative feedback contributes positively to the intrinsic motivation of athletes. The research results (Sheehan et al., 2018) have shown that the predictor social support enables intrinsic motivation in athletes. The findings (Martín et al., 2018) indicate that coaches' specific positive behaviors (apart from social support) and their autocratic behavior are predictive for the level of intrinsic motivation in athletes. Finally, in her doctoral dissertation, Šimková (2019) has found that certain positive and negative manifestations of a coach are significant determinants of intrinsic motivation in cadet basketball players.

Therefore, the findings so far suggest that there of coaches' behaviors (positive and negative) have relevant predictive validity in predicting young athletes' intrinsic motivation.

In their study (Palou et al., 2017), the authors have pointed out that adolescent athletes in the process of making achievements prefer task and mastery-oriented climate, or performance and result. That orientation towards certain goals is defined by the complex correspondence between goal orientation disposition (level of interpersonal relationships) and motivational climate (situational level) which are generated by significant people such as coaches, teammates, parents, etc.

The authors (Jowette & Lavallee, 2007) have pointed out that there are two fundamental models of motivational climate. Cooperation and mastery-oriented motivational climate is created when clear social authority highlights individual progress, effort and cooperative learning. Ego-oriented motivational climate is created when some athletes receive special treatment, and mistakes lead to punishment (Amado et al., 2019). The authors (Newton and sur., 2000) believe that a coach who pays differential attention to players depending on their anthropological skills, punishes players' mistakes and encourages rivalry between them, creates positive model of motivational climate. The research (Elferink-Gemser et al., 2019) regarding motivational climate and athletes' physical activity points to the high level of their interpersonal relationships.

According to the self-determination theory (Ryan and Deci, 2000), athletes' intrinsic motivation represents the psychological process which encourages mental or physical activities, and affects "from the inside" their individual and self-initiated behavior. On the one end there is amotivation which is the absence of volitional drive to engage in an activity, and on the other end is intrinsic motivation. So, this intrinsic form of motivational behavior implies autonomous or self-defined engagement in a physical activity for the satisfaction that activity brings. The research authors (Charbonneau et al., 2006) have pointed out that that the higher level of perceiving the self-defined behavior is in correlation to positive cognitive (fox example, focus), affective (for example, enjoyment), and behavioral (for example, persistence) outcomes. They believe that especially beneficial experiences and outcomes interact with intrinsically motivated engagement in physical activities. According to the research (Murayama et al., 2006), intrinsically motivated athletes train more and with more persistence when the motivation is not enough. The same authors believe that intrinsically motivated athletes perceive satisfaction as a result of developing their individual skills and techniques, and their constant training.

Based on the research findings so far, the aim of this research was to examine the partial contribution of coaches' behavior, their positive or negative actions, and mastery-oriented motivational climate in predicting the variance of intrinsic motivation in cadet basketball players. Based on the cited findings, the following *hypotheses* are formulated: (H_1) the assumption is that the variable coach's mastery-oriented motivational climate will be relevant partial determinant in predicting adolescent basketball players' intrinsic motivation, and (H_2): it is expected that negative coaching behavior has relevant contribution to intrinsic motivation of cadet basketball players.

METHOD

Sample and procedure

The pertinent sample of participants included 114 cadet basketball players from Serbian Admiral Bet League. The sample included participants from five basketball clubs: BC "Metalac" (Valjevo), BC "Kolubara" (Lazarevac), BC "Čačak 94 Quantox" (Čačak), BC "Zlatibor Gold Gondola" (Čajetina), and BC "Sloboda" (Užice). Average age of participants was 15,36 years (SD = .71). All participants had minimum two years of systematic and organized basketball training, at least three times a week. The participation was voluntary, and consented to by the parents.

The research was conducted during the month of, February in 2023. Prior to conducting the research, parental consent was requested, as well as the consent from the coaches and club management. The participants were told that they could quit at any

moment and that they do not have to answer certain questions. The testing lasted approximately 30 minutes. The research was conducted in accordance with the Declaration of Helsinki, and was approved by the ethical committee of Serbian Academy of Innovation Sciences in Belgrade.

Measuring instruments

The Leadership Scale for Sports questionnaire – LSS (Chelladurai and Saleh, 1980) measures different leadership styles of coaches, and it includes 40 items distributed among 5 subscales. Two subscales include coach's characteristic traits in decision making: democratic behavior where a coach motivates athletes to be active participants in the decision making process regarding conducting trainings, goals, strategies and tactics (9 items, for example *"My coach expects athletes to give their opinion regarding strategies for a certain competition"*), and autocratic behavior where coach imposes their own authority and independence in decision making (5 items, for example: *"My coach speaks in a way that does not allow for asking questions"*). The next two subscales include coach's motivational skills: positive feedback where a coach recognizes and praises athletes after a good performance (5 items, for example: *"My coach shows that they respect an athlete's good performance."*), and social support where a coach expresses interest in an athlete's personal well-being (7 items, for example: *"My coach shows interest in the personal well-being of athletes."*). Finally, the dimension training and instructions of a coach directed towards improving athlete's performance, skills and technique (13 items, for example: *"My coach instructs each athlete individually in skills."*). The participants assessed the frequency of coach's behavior on a 5-point Likert scale (1 – *never*; 5 – *always*) and total score on each subscale is presented as the arithmetic mean of all answers to the items in the questionnaire. Higher score indicates higher frequency of a specific coach's behavior. The reliability of the subscales is manifested using the Cronbach's alpha coefficient, which is satisfactory for this research and is α = .92 for training and instructions, α = .83 for democratic behavior, α = .74 for autocratic behavior, for α = .82 social support, and α = .78 for positive feedback. The obtained results are reliable and are in accordance with the original version of the LSS research (Chelladurai and Saleh, 1980).

Negative Coaching Behavior Questionnaire – UNPT (Greblo Jurakić i Keresteš, 2017) measures the frequency of a coach's negative behavior. It includes 13 items distributed to three subscales: insensitivity to individual well-being of athletes (4 items, for example: *"My coach does not give support to athletes during stressful situations."*), negative feedback (5 items, for example: *"My coach humiliates athletes during training."*), and result-oriented coaching (4 items, for example: *"My coach expects athletes to win at all costs."*). The participants measure the frequency of different coach's behaviors on a 5-point Likert scale (1 – *never*; 5 – *always*) and total score on each subscale is presented as the arithmetic mean of all answers to the items in the questionnaire. The obtained Cronbach's alpha reliability coefficients for the subscales are satisfactory and are α = .79 for insensitivity to individual well-being of athletes, α = .82 for negative feedback, and α = .77 for result-oriented coaching.

Perceived Motivational Climate in Sport Questionnaire (*PMSCQ*; Seifriz i sar., 1992) contains 21 items distributed to two subscales: mastery-oriented climate focused on learning, improvement and cooperation (9 items, for example: *"Every person feels like an important member of the team."*), and performance-oriented climate focused on result and competition (12 items, for example: *"In this team, it is very important to outperform other team mates."*). The participants express their level of agreement with an item on a 5-point scale (1 – *I fully disagree*; 5 – *I fully agree*), and total score on both subscales is presented as the arithmetic mean of all answers to the given claims. Higher score indicates higher level of manifestation of the specific characteristics of a motivational climate model. The Cronbach's alpha for the subscale that examines mastery-oriented climate is high and is α = .84.

The Intrinsic Motivation Inventory – IMI (McAuley et al., 1989) is a multidimensional measuring instrument constructed in accordance with the self-determination theory. The questionnaire consists of four subscales. The interest/enjoyment subscale (5 items, for example: *"Training this sport is fun."*) includes measures of self-assessment of intrinsic motivation, while other three subscales include antecedents (perceived competence) or outcomes. Just the interest/enjoyment subscale is used in this research, taken from the adjusted version of the questionnaire (Trboglav, 2006). The participants

expressed their level of agreement with an item using a 5-point Likert scale (1 – *I fully disagree*; 5 – *I fully agree*), and the total score is presented as the arithmetic mean of the answers to all claims. Higher score means higher level of intrinsic motivation. The calculated Cronbach's alpha shows high internal consistency of the subscale and is $\alpha = .91$.

Statistical data analysis

Descriptive parameters of central tendencies were calculated for all variables used in the analysis: arithmetic mean, standard deviation, standard error of the mean, skewness and kurtosis. The Pearson correlation coefficient of linear correlation and hierarchical linear regression analysis were used to test the hypothesis. Statistically significant result was based on the probability value ($p \leq .05$ or $p \leq .01$). The 28.0 version of the software IBM SPSS Statistics was used for data processing.

RESULTS

The results of certain variables show maximum mean value of the variable intrinsic motivation, and minimum mean value of the variable negative feedback. The calculated coefficients of skewness and kurtosis range within the acceptable values between + and – 1, except for the variable negative feedback which disrupts the criterion of normal distribution (Garson, 2012). It means that there are no statistically significant score variations on the bell curve of the Gaussian distribution, which is a prerequisite for conducting further parametric analyses.

The Pearson correlation coefficient was used to present the correlation between the measuring variables specific coaching behavior, mastery-oriented motivational climate, and intrinsic motivation (Table 2). In total, 54 bivariate linear correlations were calculated, from which 45 correlations, or 69% are statistically significant.

Descriptive data of the variables used on our sample are presented in Table 1.

Table 1. Descriptive statistics of the used variables

Variables	*AM*	*SD*	*Sk*	*Ku*	*SE*
Training and instructions	4.15	.62	-.77	-.48	.05
Democratic coaching	3.56	.58	.90	.86	.08
Positive feedback	3.69	.81	-.86	-.79	.07
Insensitivity to athlete's well-being	1.74	.65	.65	.68	.06
Autocratic coaching	3.14	.83	.89	-.53	.05
Result-oriented coaching	2.97	.90	-.77	.64	.09
Mastery-oriented motivational climate	4.30	.44	.72	-.75	.06
Intrinsic motivation	4.75	.55	.69	.86	.08
Social support	3.66	.64	.84		
Negative feedback	1.36	.72	.57	3.09	11.08

AM = arithmetic mean; SD = standard deviation, *SK* = skewness, *Ku* = kurtosis,
SE = standard error of skewness and kurtosis (*N* = 114).

Table 2. The matrix of intercorrelations for assessing specific coaching behavior, mastery-oriented motivational climate, and intrinsic motivation

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Training and instructions	-									
2. Democratic coaching	.75**	-								
3.Socila support	.75**	.68**	-							
4.Positive feedback	.73**	.70**	.72**	-						
5.Autocratic coaching	.10	.05	.19*	.10	-					
6.Insensitivity	-.30	-.19*	-.16*	-.31**	.46**	-				
7.Negative feedback	-.17	-.09	-.07	-.13	.29	.48**	-			
8.Result oriented coaching	.03	.08	-.02	-.06	.18*	.27**	.30**	-		
9.Mastery-oriented motivational climate	.66**	.52**	.40**	.69**	-.06	-.28**	-.19*	.05	-	
10.Intrinsic motivation	.40**	.21*	.18*	.29**	-.08	-.33**	-.35**	-.04	.50**	-

Legend. * $p \leq .05$; ** $p \leq .01$.

Table 3. The results of the hierarchical regression analysis for predicting criterion variable intrinsic motivation

Variables	BM1	BM2
Pleasant actions of a coach	.31	.08
Unpleasant actions of a coach	-.28	-.19
Mastery-oriented motivational climate		.29
F	15.46	15.46
R^2	14 (16)	30 (18)
R^2F		.16

MC – Motivational climate; β = Standardized coefficient of predictio variables in multiple regression;
M1, M2 – models of the groups of predictors in the hierarchical regression analysis; F – F- values of the relations between the two sizes; R^2 = the coefficient of multiple correlation – total contribution of the predictors to the explained criterion variable; ΔR^2 = the coefficient of determination – contribution of the added group of predictors to the proportion of the explained variance. ** $p \leq .01$

The correlation matrix revealed correlations between the examined variables which range from low (r = .18) to medium (r = .75). The correlation analysis showed high positive intercorrelations of the specific coaching behavior. In addition, there's a high positive direction of the correlation between the variables insensitivity to athlete's well-being and negative feedback, as well as the medium linear correlation between these variables and the variables result-oriented motivational climate and autocratic coaching. Additionally, the results have shown that the examined variables autocratic behavior and result-oriented motivational climate present low-to-medium but relevant intercorrelation.

Hierarchical linear regression analysis was conducted with the aim of examining the influence of coaching behavior and mastery-oriented motivational climate on explaining the variability of the criterion intrinsic motivation (Table 1). Two groups of examined variables were included in the analysis of this regression model: the first one was coaching behavior, and the second group included the predictor mastery-oriented motivational climate.

The total contribution to the explained variance has shown that the coaching behavior and mastery-oriented motivational climate can account for the medium proportion of the 30% of the variability of the criterion variable intrinsic motivation. The both groups of the tested regression model of the examined predictor variables give statistically significant contribution to explaining the criterion variability. The first group of variables, coaching behavior, accounted for the relatively small proportion (14%) of the variance of intrinsic motivation in young cadets, while the second group (mastery-oriented motivational climate) accounted for the additional 16% of the proportion of the variance of the criterion variability. Therefore, the second group increases relevantly the percentage of the predictor variability which confirms the validity of the mastery-oriented motivational climate. Besides, in the first group of independent variables of multiple linear regression individual coaching behavior showed itself as positive (β = .31, $p \leq .01$), and negative feedback as negative partial predictor (β = -.28, $p \leq .01$) of intrinsic motivation. This shows that coaches with clearly positive behavior achieve higher level of intrinsic motivation, while coaches who manifest negative behavior realize lower level of intrinsic motivation. Finally, in the second group, after including mastery-oriented motivational climate, which manifested itself as positive predictor, the value of standardized beta coefficient of the examined variable positive coaching behavior no longer offers statistically significant contribution to the prediction of the proportion of the variance criterion of intrinsic motivation.

DISCUSSION

The aim of this research was to check the special influence of coaching behavior and mastery-oriented motivational climate on explaining intrinsic motivation, as well as the contribution of positive and negative coaching behavior on the variability of the intrinsic motivation in adolescent basketball player.

Hierarchical regression analysis has determined that the first group of predictor variables, positive and negative coaching behavior, can account for 14% of the criterion variability of intrinsic motivation. The predictor mastery-oriented motivational climate manifested increased validity in predicting intrinsic motivation. Introducing that variable in the second group of regression model, the segment of the explained variability of intrinsic motivation increased to 30%. That shows that the findings obtained using our sample match with the results of other research (Romualdas et al., 2021). In the first group of the regression, both predictor variables have the statistically significant influence in predicting the variance criterion, with the close values of beta coefficient but with opposite directions. Positive coaching is manifested in positive direction, and negative coaching as a relevant negative predictor of the intrinsic motivation in cadet basketball players. After introducing the mastery-oriented motivational climate which based on the value of the standardize regression coefficient is the best partial determinant, the calculated beta coefficients in both predictors included in the first group reduce, and the positive coaching is no longer statistically significant determinant of intrinsic motivation in adolescent basketball players. That result, the reduction of the value of the standardized regression coefficient of coaching behavior in explaining intrinsic motivation after introducing mastery-oriented motivational climate can be explained by the interaction of the predictor variables, especially high intercorrelation between the variables positive coaching and mastery-oriented motivational climate.

Therefore, the postulated hypothesis that the variable mastery-oriented motivational climate will be a significant predictor in explaining the intrinsic motivation in adolescent basketball players has been

confirmed. According to the self-determination theory (Werdhiastutie et al., 2020) coaching behavior can contribute to the intrinsic motivation of athletes and satisfaction of their main psychological needs. The results of another study (Affum-Osei, 2014; Goffena & Horn, 2021; Mageau & Vallerand, 2003) have also determined that with their behavior a coach can contribute to the socio-psychological climate in a team, and that mastery-oriented motivational climate has an indirect positive effect on intrinsic interests of athletes by satisfying their fundamental psychological needs. In addition, the authors (Moore & Weiller-Abels, 2020; Teques et al., 2021; Trbojević & Petrović, 2022) have found that positive coaching behavior has an effect on intrinsic motivation of cadet athletes, and that they are determined by the mastery-oriented motivational climate, and that positive coaching behavior is in correlation with mastery-oriented motivational climate.

The research (Moore & Weiller-Abels, 2020; Romualdas et al., 2021) has found the positive correlation between the characteristic positive coaching behavior and mastery-oriented motivational climate, and the negative interaction between autocratic behavior and motivational climate gave expected results that match the ones from the self-determination theory (Werdhiastutie et al., 2000), achievement goal theory (Ruslana et al., 2019), and the findings of the study (Amado et al., 2019; Pulido et al., 2019). That means that certain elements of the mastery-oriented motivational climate are dominant in individual progress, achieving goals, and cooperative learning among athletes. Such motivational climate is characterized by the set which is presented to athletes in the form of complex tasks, which require different level of effort depending on athlete's individual skills. According to the study findings (Romualdas et al., 2021), in such social environment coaches motivate athletes to take over leading roles and make their own decisions. Such mastery-oriented motivational climate enables the sense of independence in athletes who feel like they can plan their own actions in such environment (Bolter & Kipp, 2018). The aforementioned authors have concluded that in a team where effort and personal progress in valorized, an athlete is more likely to be satisfied with their skills. In addition, social environment where coaches emphasize cooperation and show that each player has a role in a team creates a place where athletes are satisfied to cooperate (Huntrods et al., 2017; Keatlholetswe, & Malete, 2019; Laborde et al., 2016**).**

The conducted transversal research has certain methodological limitations which are primarily caused by the method of data collection which could have affected the results, and final conclusions. It is important to mention these methodological limitations when interpreting the obtained results, and offer suggestions for future research. First limitation of this research is the pertinent sample relatively small in size and limited to just cadet basketball players, where one gets a static view of coaching behavior, motivational climate, and intrinsic motivation, which is actually dynamic. In addition, the findings on our sample were obtained based on the correlations that do not enable defining the causal interaction between the used variables and cause-effect conclusions, as well as the prediction of generalization of the complete sports population in Serbia. Secondly, the data in this research were obtained using the (self)assessment method, so the (self)assessment variables were exposed to external influences such as socially desirable responding, participants' tendency to agree with all offered answers in order to present themselves in better light, which can lead to less objectivity in answering and have negative effect on the validity of the results (Junior et al., 2018; Murayama, 2022; Wall et al., 2022). Thirdly, the questionnaires LSS and UNPT were oriented solely to the frequency of behavior, so future research should examine the quality and not only the quantity of coaching behavior (Kaya, 2019; Wilczyńska et al., 2022). Another limitation of this research is the orientation towards intrinsic motivation, while other types of motivations are disregarded because of the self-determination theory (Day et al., 2022; McLaren & Spink, 2020). Including other types of motivation would enable more clear understanding of the link between the coaching behavior and motivation of athletes. The constructs autocratic behavior and result-oriented motivational climate have shown that they are in correlation to the mastery-oriented motivational climate and intrinsic motivation. Thus, we can presume that their exclusion from the research would result in a more relevant model which would not be without its predictive capacity. Finally, the last methodological limitation is the slightly lower intensity of the linear correlation between the measured constructs of autocratic behavior and negative coaching. This could be explained by asymmetry which caused the reduction of variability on those variables.

The research of these constructs in Serbia is relatively new, as are the studies that focus on negative aspects of coaching, but this study has confirmed the positive

psychometric characteristics of the measuring instruments used which is important for the reliable identification of the relations between the examined variables. From the theoretical perspective, this study also confirms some claims for the self-determination theory (Ryan, & Deci, 2000) and partially explains the relations between the positive and negative coaching, mastery-oriented motivational climate, and intrinsic motivation in cadet basketball players. Practical implications of the conducted research are primarily expressed in instructions for coaches on how they could use their behavior and motivational climate they generate to influence the variance of intrinsic motivation in cadet basketball players, and which represents type of motivation important for the general development of personality and success of athletes.

The research findings can help improve various styles of coaching and help coaches keep the quality relationship with the athletes. At the same time, the results of this study can help adolescents athletes better understand their relationship with their coach. Additionally, these results can be used to improve the training processes and the interdisciplinary orientation in working with athletes. These results can also be useful to sports psychologists who work with athletes who compete.

The constructs examined in this research have not been examined enough, especially in Serbia, and further research would surely give more precious information. With the limitations and the lack of research in mind, it is important to conduct further experimental and longitudinal research with the more representative sample including the greater number of participants of various ages as well as female participants. Future research should also expand on other relevant constructs which were not included in this research, such as child's assessment of parental behavior and emotional regulations which could play relevant role in this research matter.

CONCLUSION

Applying the hierarchical regression model revealed that the predictor variables examined on cadet basketball players (positive and negative coaching and mastery-oriented motivational climate) explained the criterion of intrinsic motivation with totally 30% of the variance. Additionally, it has been determined that independent variables negative coaching (β = -.31) and positive mastery-oriented motivational climate (β= -.28) have significant influence on intrinsic motivation in adolescent athletes. Finally, it is necessary to further examine these constructs in order to gain more efficiency in predicting the relations between coaching behavior, mastery-oriented motivational climate, and intrinsic motivation in cadet basketball players.

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Corresponding author:
Miroljub Ivanovic,
Serbian Academy of Innovation Sciences, Belgrade, Serbia
11000, Visnjicka 91°, Serbia
Tel. 014/220-587; 064/875-28-32
E-mail:miroljub.ivanovic@.gmail.com