

RELATIONS BETWEEN THE PERSONALITY TRAITS OF THE FIVE-FACTOR MODEL AND MOTIVATION OF JUNIOR VOLLEYBALL

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Abstract: The aim of this transversal research was twofold: to check the metric characteristics of the measuring instruments, and to examine the interactions of the model of The Big Five personality traits – Big Five (as predictor) and dimensions of motivation (as criterion) on a sample of junior volleyball players. The pertinent sample included (N = 218) junior Serbian volleyball players of average age (Mage= 18.05, SD = 1.52). the following measuring instruments were used: Big Five Inventory (BFI), Sport Attitudes Inventory (SAI), and Task and ego orientation in Sport Questionnaire (TEOSQ). Cronbach's alpha reliability coefficient has shown that the values of internal consistency of the measuring instruments are satisfactory, which means that they are suitable to be used in the context of Serbian sports. Two canonical functions statistically significant on the level ($p \leq 0.03$) were extracted using the canonical correlation analysis. The first pair of the isolated canonical factors, with 37% of the explained variance, is determined by personality traits: conscientiousness, extraversion, and openness, as well as by the dimensions of motivation: motive for achieving power, motive for achieving success, and task orientation. The second pair of the isolated canonical factors in the group of personality traits is defined by the variables: neuroticism, agreeableness, and conscientiousness (on the negative end), motive for avoiding failure, and goal orientation (on the positive end). That isolated canonical latent variable indicates that young athletes are prone to avoidance as a model of behavior. Empirical findings of this research can be used in player selection and managing sports training and competition of junior volleyball players. The obtained canonical structures can contribute to a better understanding of correlations between latent variables in adolescent volleyball population in Serbia, which have not been sufficiently examined nor scientifically explained.

Keywords: personality „Big Five” Factors, dimensions of motivation, volleyball, goal orientation

INTRODUCTION

Despite the fact that basic personality traits are significant determinants of athletic success, the overview of current literature shows the lack of research on the correlation between the five-factor model of personality and dimensions of motivation within the sports population (Ivanović et al., 2015; Ivanović & Ivanović, 2021). The past 20 years have seen many theories which explain that personality has relevant influence of human behavior. One of the most dominant theories is the “Big Five” theory (Turda, 2024). That hierarchical five-factor model of personality traits structures the following five basic dimensions: extraversion, agreeableness, conscientiousness, neuroticism/emotional stability, and openness to experience/intellect.

The authors (Godfrey et al., 2024) have determined the correlation between the basic personality traits agreeableness, conscientiousness and emotional stability in adolescents, while also extracting the two factors of the higher order: Alpha factor of social desirability and Beta factor of personal growth and development. Additionally, the factor of social desirability includes mutual aspects of the traits agreeableness, conscientiousness, and emotional stability which are socially desirable, while the traits neuroticism and low conscientiousness are part of the undesirable personality traits. Moreover, the research authors (Lebuda et al., 2023) have isolated two factors: 1) stability in emotional, motivational, and social domain which consists of emotional stability, agreeableness, and conscientiousness, and 2) plasticity factor, a tendency to be flexible in behavior and cognition, which consists of extraversion and openness. The authors (Yıldız & Eldeleklioğlu, 2024) believe that the dimensions of personality emotional stability, agreeableness, and conscientiousness which form Alpha factor grow gradually under the influence of new obligations and increased maturity. On the other hand, the research authors (Oliver et al., 2024) have determined that personality traits extraversion, openness to experience, which form Beta factor, gradually decline with age. Such individuals, highly positioned on the general factor of personality, are characterized by the traits emotional stability, agreeableness, and conscientiousness. On the other hand, these authors claim that individuals with low level of the general factor of personality can be characterized as neurotic, disagreeable and unconscientious. They believe that the five-factor Big Five model of personality is the closest replacement of two big factors: Alpha which is represented by neuroticism and Beta which is represented by extraversion.

A number of theorists and psychologists have dealt with the term motivation, its definition and identifying the latent dimensions that motivate people (Ivanović & Ivanović, 2018; Ivanović & Ivanović, 2023a). The complexity of the phenomenon motivation, disagreements between authors about its structure, and application of the various methods of its measuring, have resulted in the existence of multiple theories of motivation, which explain what energy and direction give to certain behaviors (Ivanović & Ivanović, 2023b; Ryan & Deci, 2020). Additionally, the authors (Bureau al., 2023) define the construct motivation as psychological process that moves, directs and sustains a desired direction, intensity and duration of mental or physical behavior that satisfies certain needs of an individual. They differentiate between three main aspects of motivation: focus on personality traits, focus on situation, and on the aspect of interaction. In interpretation that means that behavior is a result of interaction between personality traits, dimensions of motivation, and situational factors. Within the context of this study, the following theories of motivation are significant: a) need for achievement, b) attribution theory, and c) theory of aim achievement. The aforementioned theories suggest that individuals who achieve high or low achievements differ based on their motives, tasks they choose, effort they put, and their persistence in achieving them.

The connection between the five basic personality traits and the manner of performance in sports is examined using various research outlines (Costa et al., 2024). The aforementioned researchers have determined that an efficient way of performing under the influence of the stress of training and competing can be

successfully predicted using a higher level of personality traits conscientiousness, emotional stability and extraversion, meaning that luck in sports can successfully be predicted using high level of extraversion and low level of neuroticism. The meta-analysis (Guntoro et al., 2023) has determined that basic dimensions of personality correlate with teamwork performance. The research (Utashev, 2024) has shown that elite athletes have higher tendency towards extraversion and emotional stability than recreational athletes, meaning the athletes who compete on national or international level compared to the athletes who compete in club or regional competitions show lower level of basic dimensions of neuroticism, and higher level of conscientiousness and agreeableness. Additionally, the study (Fabbricatore et al., 2021) has determined that the personality traits conscientiousness and neuroticism are relevant determinants for predicting various aspects of performance in sports competitions, meaning that the combination of low neuroticism and high conscientiousness interacts to high athletic achievements.

Empirical results (Cook et al., 2020) have shown that long-term success in sports is partially the function of personality, while short-term success does not depend on personality. Additionally, it has been found that there are lower results of neuroticism and higher results of conscientiousness between elite and non-elite athletes, meaning that competitive athletes have higher expressed extraversion and neuroticism and lower agreeableness than non-competitive athletes. The study (Dominski et al., 2021) has determined that the dimension of personality conscientiousness interacts positively with the correlate quality of athletic preparation for a competition, and that emotional stability positively interacts with the more efficient coping strategies during a competition. The research (Fong et al., 2021) has shown that athletes with the low level of the dimensions agreeableness and extraversion are more prone to aggressive behavior, while athletes with low level of openness are more prone to using avoidance strategies, which means that the athletes with high level of conscientiousness and extraversion are more prone to applying strategies directed towards facing problems. With that in mind, it means that extraverted athletes prefer high level of attention while they do sports, while with introverted athletes, high level of attention causes bad performance (Laborde et al., 2020). It should be noted that negative relationship between success in sports and neuroticism is based on the qualities of instinctual anxiety which hinders an athlete from performing a task. At the same time, the research authors (Moritz et al., 2020) point out that the generators of the correlation between the personality trait psychoticism and success in sports are based on the higher level of aggression, egocentricity and competitiveness of athletes who achieved better score on psychoticism. The aforementioned psychological characteristic is less present in team sports, where cooperation is required, than in individual sports. So, the previous empirical research helps us understand the predictions of personality on behavior of athletes during competition. It can be expected that future research on the role of personality will be very important to sports psychologists who create intervention programs with identification of the aforementioned psychological constructs (Piepiora, 2021).

The empirical studies mentioned here have shown that personality plays a relevant role in sports performance and achievement. Therefore, further research is

necessary in order to give more detailed information on the relations between the five personality traits and significant factors of motivation that correlate to success in sport. Keeping in mind the understandings of developmental psychology and personality psychology, and the fact that similar studies have not been conducted on adolescent athletes in Serbia, the aim of the conducted research was twofold: to check the internal consistency of the applied questionnaires and to examine the relations between the variables (dimensions of personality and dimensions of motivation) on the sample volleyball players. In accordance with the earlier empirical studies and the aim of this research, alternative hypotheses were formulated: H1 – it is assumed that measuring instruments used in the research have satisfactory values of the reliability coefficient, H2 – statistically significant positive correlation between dimensions of personality (extraversion, conscientiousness, and openness) and motivation in young athletes (motive for achieving success and motive for achieving power) is expected, and H3 –negative linear correlation between personality traits agreeableness, neuroticism and conscientiousness, and the motive for task orientation in adolescent athletes is expected.

Operationalization of the examined constructs and the selection of the variables relevant for the predictive and criterion group of variables in this work is based on the integration of the earlier theoretical findings and empirical confirmations from the area of personality psychology, developmental psychology, and sport psychology.

METHODS

Participants

This transversal research was conducted on the sample of junior Serbian volleyball players (N = 218) from seven volleyball clubs: „Valjevo“ (Valjevo), „Železnicar“ (Lajkovac), „Ub“ (Ub) i „Srbijanka 014“ (Valjevo). The average age of participants was 18.05 years of age (SD = 1.52). All participants had minimum two years of systematic and organized training, at least three times a week. The testing was conducted in groups, during regular training sessions in June 2024. The data were obtained by the “face to face” self-report method.

In accordance with the stated aims, the preparation of the research involved the translation of the applied measuring instruments of the BFI and SAI questionnaires in Serbian. Before filling in the questionnaire the participants were given detailed instructions on how to individually fill in the questionnaires and the aim and the subject of the research were explained, without going into details about what each instrument measures (this was done to prevent socially desirable responding). They were told not to think too much about the answer, because it is not a knowledge test, and that there are no right or wrong answers, and in case of doubt they should chose an answer they are more inclined to. They were also told that they could quit at any time with no consequences. The testing was conducted in groups during regular training sessions, and it lasted approximately 30 minutes. It was carried out by well-educated and motivated examiners - the authors of this paper. The research was anonymous and on voluntary basis, and it was realized with the consent of school principals. The research was approved by the science

committee of the Serbian Academy of Innovation Sciences from Belgrade, and was conducted in accordance with the ethical principles of the Declaration of Helsinki.

Big Five Inventory -BFI

BFI (Benet Martinez and John, 1998) measures basic traits of the five-factor model and it has been translated into Serbian. The instrument includes 44 items for the self-assessment of five personality traits, for example extraversion (8 items), agreeableness (9 items), conscientiousness (9 items), neuroticism (8 items), and openness to experience (10 items). Participant's task is to select, on a Likert-type scale, to which extent a statement refers to them, ranging from "I fully disagree" to "I fully agree". The results are presented separately for each subscale, as arithmetic mean of a participant's answers on each subscale. The higher score on BFI means more expressed specific dimensions of personality, meaning that that person is more characterized by their certain personality traits, while lower score means less expressed personality trait. The reliability coefficient – internal consistency type (Cronbach's alpha) for measuring "Big Five" factors of personality in this research ranges from 0.75 to 0.90: for extraversion ($\alpha = 0.79$), agreeableness ($\alpha = 0.77$), conscientiousness ($\alpha = 0.84$), neuroticism ($\alpha = 0.80$), and openness to experience ($\alpha = 0.80$). According to Fagel (2013), the measured values show acceptable reliability of the applied measuring instrument because lower range of the value of the internal consistency measured with Cronbach's alpha is higher than 0.70.

Sport Attitudes Inventory – SAI

SAI (Willis, 1982) contains 40 items and examines three main motives: MAS – motive for achieving success (17 items), MAF – motive for avoiding failure (11 items), and MAP – motive for achieving power (12 items). MAS (example of a claim: "I most enjoy things I am successful at") represents imbalance between the total set up level of aspiration and the total level of task performance. It is measured by giving participants psychomotor tasks where they have 30 seconds to put as many matches as they can in a wooden board with specially made openings. The participants are first asked how many matches they think they could put in the holes on the board, by which they are assessing how successful they would be. This process is repeated four times in same conditions, and the results are being written down. MAF includes items which represent the tendency to avoid failure and fear of failure (example of a claim: "I easily give up when faced with a difficult task"). The results on our sample have given satisfactory reliability for all three scales of this instrument. The reliability coefficient (Cronbach's alpha) ranged from 0.80 to 0.88 which confirms good internal consistency of the measuring instrument.

Task and ego orientation in Sport Questionnaire – TEOSQ

TEOSQ (Duda, 1989) contains a 13-item scale, and it is the most often used measuring instrument for examining motivation in sport and physical activity. It includes 13 items and it consists of two independent subscales – task and ego. Task goal orientation scale examines personal focus towards goal and perfecting athletic skills, and it contains seven claims. Ego goal orientation scale consists of six claims and it examines individual focus towards superior performance and result. An

example of a claim that represents orientation towards result is “I feel most successful when I achieve the best results”, while a claim “I feel most successful when I learn new skills and that motivates me to exercise more” indicates orientation towards task and development of skills. Participant’s task is to, on a five-point Likert-type scale, answer the question by circling a value from 1 to 5 depending on how successful they feel while training (1 – I fully disagree; 5 – I fully agree). Total score is counted for each scale individually by calculating arithmetic means of the claims. Higher total score on the orientation towards task scale indicates towards higher focus of a participant on task and perfecting athletic skills, while higher score on the orientation towards performance and result indicates higher focus on performance and result. Both subscales – task and ego in this research have shown high and satisfactory coefficients of internal consistency (Cronbach’s alpha = 0.90 and Cronbach’s alpha = 0.89).

Statistical analysis

The descriptive data which describe the basic parameters of the examined variables are shown through the values of arithmetic mean, standard deviation, and skewness and kurtosis. The reliability analysis was conducted in order to determine the internal consistency of the applied scales expressed through Cronbach’s alpha coefficients. The Pearson correlation coefficient was used to calculate the linear correlation between the variables chosen for this research. Canonical correlation analysis was used with the aim of determining the correlation between personality traits and the dimensions of motivation. P-values with the probability of error lower than 0.05 were considered statistically significant. The software IBM SPSS, Statistics for Windows, version 26 was used for statistical data processing.

RESULTS

The main descriptive statistics are shown in Table 1. Arithmetic means of certain subscales range between low for neuroticism and high for task orientation. Keeping in mind the fact that the subscales examine various psychological characteristics, the results on some subscales is not meant to be compared or analyzed.

Table 1. Descriptive parameters of the examined dimensions of personality and dimensions of motivation

Variables	M	SD	Min	Max	Sk	Ku	K-S test
Extraversion	30.14	3.96	18.00	39.00	-0.60	0.06	$p \leq 0.01$
Agreeableness	28.36	3.96	19.00	43.00	-0.91	0.95	$p \leq 0.05$
Conscientiousness	31.03	4.60	16.00	40.00	-0.27	0.14	$p \leq 0.05$
Neuroticism	20.63	4.33	8.00	34.00	0.32	0.82	$p \leq 0.05$
Openness	38.69	4.90	20.00	50.00	-0.24	0.23	$p \leq 0.05$
Motive for achieving success	70.01	6.95	50.00	81.00	0.56	0.46	$p \leq 0.05$
Motive for avoiding failure	29.90	7.01	16.00	49.00	0.34	0.32	$p \leq 0.05$
Motive for achieving power	46.13	4.99	30.00	61.00	0.12	0.57	$p \leq 0.01$
Goal orientation	18.16	5.03	7.00	28.00	0.45	0.83	$p \leq 0.01$
Task orientation	27.08	3.77	19.00	32.00	0.05	0.60	$p \leq 0.01$

Legend. M = arithmetic mean; SD = standard deviation; Min = lowest value; Max = highest value; Sk = Coefficient of skewness Ku = kurtosis; K-S = Kolmogorov–Smirnov test test). Value of standard error (SE) with the indicator Sk is 0.12, and with Ku is 0.23.

Analyzing the parameters of the shape of distribution for the used subscales, it was revealed that skewness and kurtosis did not deviate much from the normal ($\geq \pm 2$), which according to the authors (Tabachnick & Fidell, 2013) indicates normal Gaussian distribution on the examined group of participants. Additionally, the calculated p-values of K-S test are under 5% which means that no variable deviates significantly from Gaussian distribution. Therefore, parametric methods were applied in the next part of statistical data processing.

Correlations between the examined variables of the “Big Five” personality traits and dimensions of motivation applied in this research are shown in Table 2.

Table 2. Intercorrelations between the variables personality traits and dimensions of motivation used in the research

Variables	1	2	3	4	5	6	7	8	9
1. Extraversion	-								
2. Agreeableness	0.05	-							
3. Conscientiousness			-						
4. Neuroticism	0.29**	0.45**	0.39**	-					
5. Openness	0.27**	0.17*	-0.28**	-0.05	-				
6. Motive for achieving success	0.42**	0.01	0.41**	-0.07	0.33**	-			
7. Motive for avoiding failure	0.02	0.15*	-0.13	0.28**	0.03		-		
8. Motive for achieving power	0.50**	0.08	0.42**	-0.10	0.25**			-	
9. Task orientation	0.16*	0.10	0.43**	-0.10	0.09	0.50**	0.25**	0.30**	0.19*

* $p \leq 0.05$; ** $p \leq 0.01$.

Taking a look at the correlation matrix, one can see that there is a great number of statistically significant correlation between the variables of personality traits and between the various variables of motivation, which do not have high correlation and range from low to moderate values. That is why it can be said that there is no multicollinearity, and that one of the prerequisites for using hierarchical multiple regression is met. Relevant interactions between certain dimensions of personality and variables of motivation are first to be noticed. For example: motive for achieving success and motive for achieving power are in positive correlation to personality traits such as extraversion, conscientiousness and openness, while the motive for avoiding failure is in positive correlation to the dimensions neuroticism and in negative correlation to the personality trait agreeableness. At the same time, the variable goal orientation is in positive correlation to the dimension openness, and variable task orientation is in positive correlation to dimensions conscientiousness and extraversion. When it comes to personality traits, extraversion is in positive correlation to conscientiousness and openness, while being in negative bivariate correlation to the dimension neuroticism. In addition, neuroticism is in negative correlation to the traits agreeableness and conscientiousness. Taking a look at the table, one can also see that the trait conscientiousness is in positive correlation to agreeableness and openness. When it comes to dimensions of motivation, statistically significant Pearson correlation coefficient were found. The variable motive for achieving success and task orientation are in positive correlation to all dimensions of motivation, and the interaction is high between the two aforementioned motives. For example: motive for achieving success is in positive correlation to the motive for achieving power, goal orientation and motive for avoiding failure, while task orientation is in positive bivariate correlation to the motive for achieving power, goal orientation and motive for avoiding failure.

Table 3 shows mathematical-statistical procedure of the canonical correlation analysis – CAA which shows the relations between the two systems of variables: “Big Five” model of personality factors (predictor group) and the dimensions of motivation (criterion group).

Table 3. Coefficients of the extracted pairs of canonical correlations and their significance

Canonical root	<i>Rc</i>	<i>Rc</i> ²	χ^2	<i>SE</i>	<i>p</i>
1.	0.61	0.37	106.23	0.04	0.03
2.	0.38	0.22	38.12	0.02	0.03
3.	0.18	0.07	8.26	0.10	0.40
4.	0.10	0.05	4.04	0.06	0.63
5.	0.03	0.01	0.02	0.03	0.74

Legenda: *Rc* = Koeficijent kanoničke korelacije; *Rc*² = Koeficijent determinacije ili kvadrirana kanonička korelacija; χ^2 = Hi-kvadrat test; *SE* = Standardna greška prognoze *Rd* = Koeficijent redundantnosti; *p* = Proporcija statističke značajnosti kanoničke funkcije.

By applying Bartlett's Chi-test χ^2 , five canonical functions were extracted, only two of which were statistically significant on the level ($p \leq 0.01$). According to

the author (Dattalo, 2014), the remaining structure of the linear combinations of canonical factors (paired variants) is not linearly connected, it equals zero and will not be interpreted because it doesn't share at least 10% of the mutual variance proportion.

Taking a look at the correlation matrix, one can see that there is a great number of statistically significant correlation between the variables of personality traits and between the various variables of motivation, which do not have high correlation and range from low to moderate values ($0.16 \leq r \leq 0.48$). That is why it can be said that there is no multicollinearity, and that one of the prerequisites for using hierarchical multiple regression is met. Relevant interactions between certain dimensions of personality and variables of motivation are first to be noticed. For example: motive for achieving success and motive for achieving power are in positive correlation to personality traits such as extraversion, conscientiousness and openness, while the motive for avoiding failure is in positive correlation to the dimensions neuroticism and in negative correlation to the personality trait agreeableness. At the same time, the variable goal orientation is in positive correlation to the dimension openness, and variable task orientation is in positive correlation to dimensions conscientiousness and extraversion. When it comes to personality traits, extraversion is in positive correlation to conscientiousness and openness, while being in negative bivariate correlation to the dimension neuroticism. In addition, neuroticism is in negative correlation to the traits agreeableness and conscientiousness. Taking a look at the table, one can also see that the trait conscientiousness is in positive correlation to agreeableness and openness. When it comes to dimensions of motivation, statistically significant Pearson correlation coefficient were found. The variable motive for achieving success and task orientation are in positive correlation to all dimensions of motivation, and the interaction is high between the two aforementioned motives. For example: motive for achieving success is in positive correlation to the motive for achieving power, goal orientation and motive for avoiding failure, while task orientation is in positive bivariate correlation to the motive for achieving power, goal orientation and motive for avoiding failure.

Standard coefficient of canonical correlation or the measure of correlation within the first orthogonal pair of canonical factors is greatest and with the risk of error of 3%, indicates a moderate degree of interaction between the linear combinations of the two analyzed sets of variables. The obtained coefficient of determination or squared coefficient of the structure of the first pair of canonical factors of 37% indicates the maximum explained proportion of common variability for linear combinations of the canonical components of the first function. On the other hand, the calculated coefficient of determination of the structure of the second pair of canonical functions explains 22% of the mutual variance, and with the smaller value of the canonical correlation coefficient, draws attention to the weaker intensity of the linear combination between the two sets of variables used in this canonical factor.

With the aim of having a more complete insight into the research problem, in the further process of multivariate data processing, structure coefficients and function coefficients (standardized canonical coefficients) are presented with the

most representative variables within the system of personality traits and dimensions of motivation which indicates what type of interaction each partial variable and canonical function has in their set (Table 4).

Table 4. The matrix of the canonical factor structure

Construct	Variables	F_{K1}	F_{K2}
Dimensions of personality	Extraversion	0.81	0.24
	Agreeableness	0.20	-0,62
	Conscientiousness	0.90	-0.50
	Neuroticism	-0.19	-0.80
	Openness	0.62	0.27
Dimensions of motivation	Motive for achieving success	0.82	0.22
	Motive for avoiding failure	-0.10	079
	Motive for achieving power	0.79	0.07
	Goal orientation	0.33	0.40
	Task orientation	0.61	-026

Note. F K 1, F K 2 = Coefficient of the structures of canonical factor

The structure of the first pair of linear composites (canonical factor) consists of 10 linear combinations of variables that were applied in this research. Analysis of the matrix of the canonical factor structure shows that the range of statistically significant correlation coefficients ranges from 0.17 to 0.90. The first extracted bipolar pair of statistical canonical functions in the set of the dimensions of personality maximally connects, i.e. positive signs load the standard canonical correlation coefficients of the variables of “Big Five” model of personality traits: conscientiousness and extraversion and openness to experience/intellect, and in the domain of orthogonal pair of the dimensions of motivation: motive for achieving success, motive for achieving power and task orientation. According to the absolute values of the canonical correlation coefficient on the canonical function and the contents of the items on the first pair of the unipolar extracted canonical factor, it can be hypothetically defined at the level of significance ($p \geq 0.01$) as conscientiousness, extraversion and intellect as the pursuit of success and power. It means that adolescent athletes who have more expressed traits of conscientiousness and extraversion have more expressed motivation for achieving success and motivation for achieving power.

The second isolated pair of linear combinations of the canonical function in the domain of personality traits is at the negative pole in importance determined by the variables – neuroticism, agreeableness, and conscientiousness, while in the domain of dimensions of motivation is at the positive pole defined by the variables motive for avoiding failure and motive goal orientation. In accordance with the maximum values of the significant canonical correlation coefficients with the isolated canonical function and the contents of the items that load it dominantly, that latent space can theoretically be interpreted, at the level of the probability of a conclusion error of 1%, as neuroticism, agreeableness, and conscientiousness – motive for avoiding failure and goal orientation. This signals that junior volleyball players who have

more expressed personality traits of neuroticism and conscientiousness have a more expressed motive for avoiding failure and goal orientation.

DISCUSSION

Seeing how the research so far have given inconsistent results, the aim of this research co-authored research was to examine the relationships between predictor variables (personality traits of the five-factor model) and criterion variables (dimensions of motivation) on a sample of junior volleyball players. The research attempted to identify the significant role of the main personality dimensions of the "Big Five" model in the predictive contribution of the variance of the dimensions of motivation in young volleyball players. So, with this transversal study, an attempt was made to contribute to the understanding of the interactions between the examined predictors of the five-factor model and criterion variables, and to enrich the professional literature with new knowledge about these correlations.

The results obtained in this research show that the first extracted canonical function on the sample of junior volleyball players on the positive side theoretically contains two different systems of variables, the basic dimensions of the five-factor personality model: conscientiousness, extraversion and openness, and also on the positive side, the motive to achieve power and the motive to achieve success, as well as task orientation. The obtained correlates of the five-factor model indicate a positive interaction of those three personality traits with the motivation of young athletes. Therefore, the isolated highly connected linear composite of the first pair of canonical factors, with 22% of the common variability, can hypothetically be interpreted as conscientiousness, extraversion and openness - motive for achieving power, success and task orientation. Therefore, the first isolated canonical factor includes positive aspects of personality traits (tendency to perceive positive emotions) and positive direction of the dimensions of motivation (tendency to achieve goals during learning and training, as well as creative and adaptive behavior in a sports environment). This means that young people, who have expressed personality dimensions of conscientiousness, extraversion and openness, and highly expressed motive for achieving power, achieving success and task orientation, will likely manifest social behavior in their sports career, which is essential for socialization and their effective mutual effect in the team during challenging competitive situations.

The second isolated canonical function in this research theoretically includes two different systems of variables, dimensions of the "Big Five" personality model: neuroticism, agreeableness and conscientiousness (on the negative side), and on the positive side the motive to avoid failure (tendency to feel negative emotions and withdrawal) and goal orientation. Accordingly, this integral canonical function, which contains the negative aspects of personality, with 37% of the explained shared variance indicates the interaction of personality traits and the dimensions of motivation. Hypothetically, it represents a disjointed and inhibiting factor in relation to the adaptation of players in the socialization process and training, which can limit the acceptance of norms and rules of sports behavior in an individual. It is assumed that volleyball players characterized by the aforementioned three personality traits and the two dimensions of motivation function more slowly. The obtained canonical

findings indicate that the bipolar second pair of linear composites of the canonical factors can be nominated as neuroticism, agreeableness and conscientiousness - motives for avoiding failure and goal orientation.

It is assumed that such young athletes are more prone to avoid failure in competitive situations or in circumstances of effort testing in order to protect their own self-esteem. At the same time, this canonical function can direct behavior in the direction of avoiding failure as a potential reaction to frustration in the motivational domain. Also, these volleyball players have more visible psychological characteristics that orient them to avoid situations of incompetence and motivate their various defense mechanisms to protect their sense of self-worth. Such young players try to be more efficient in sports activity than others, and in case of failure, they are more inclined to perceive negative emotions.

It is clear that the first and second extracted canonical functions indicate a linear correlation between the linear combinations of the basic personality dimensions of the Big Five Model and the dimensions of motivation of volleyball players as moderators of their oriented behavior. It is also expected that the first pair of canonical variables predetermines volleyball players for approach behavior, while the second pair of canonical variables prepares them for avoidance behavior.

The results of this research are in accordance with the previous analyses of the linear correlations between the personality dimensions of the five-factor model and dimensions of motivation in adolescent volleyball players. Accordingly, it was confirmed that the predictor variables of the “Big Five” model can regulate the directed behaviors of athletes (Kekäläinen et al., 2023). Additionally, according to the empirical research of the aforementioned authors, it is expected that athletes who manifest a certain level of personality traits are more likely to achieve sports success. Similar findings are given in the research (Elsborg et al., 2023) which has shown that the intensity of the correlations of athlete’s personality traits is a prerequisite for selection for participation in the competition and management of the training and competition process. Also, the basic dimensions of personality most likely affect the adaptation to the position and the tasks of an athlete within the roles in the sports game, training and as a team success in the competition. Therefore, when selecting players, coaches should aim for those who are conscientious, emotionally stable and highly motivated for sports achievement.

The obtained results further indicate that the aforementioned predictor variables influence the regulation of the variance of the behavior of volleyball players, and may be relevant for their sports achievement. On the other hand, the empirical study (Crewther et al., 2024) has shown that the level of manifestation of personality traits and dimensions of motivation and their correlation, for example, visible neuroticism and an expressed motive to avoid failure can limit the functioning of athletes by encouraging avoidant behavior. This is especially visible in stressful situations, where personality traits interact with the direction and intensity of motivation.

The research has shown that playing sports before adulthood has positive developmental effects on personality (Kekäläinen et al., 2023). Accordingly, research findings (Rogowska, 2020) indicate that playing sports contributes to real changes in basic personality traits, since they increase the level of manifestation of emotional

stability, optimal behavior and perceived control. On the other hand, the results indicate that that short-term aerobic physical activity of moderate or medium intensity, lasting 20 to 30 minutes, enables the improvement of emotional state.

Given the great interest of experts in this issue in sports, it should be pointed out that the five basic dimensions of personality are in a statistically significant correlation with sports achievement (Fabbricatore et al., 2021). It has been confirmed that the dimension conscientiousness influences task and goal oriented behavior (Kekäläinen et al., 2023), and therefore contributes to the motive for achieving success. In addition, the study (Castillo et al., 2020) has determined that more conscientious and neurotic athletes are more task oriented, that is, they manifest a lower level of agreeableness and conscientiousness.

Based on this empirical study, a theoretical structural five-factor model of characteristic combinations of personality traits and motivational dimensions can be formulated, which is especially significant because they influence the social and emotional adaptation of volleyball players. Therefore, the research findings of this work confirmed the expected relationships between the basic dimensions of personality and sports motivation, meaning that the hypotheses were partially accepted: It is assumed that the used measuring instruments have satisfactory values of Cronbach's alpha coefficients (H1); A statistically significant positive correlation between the personality dimensions of extraversion, conscientiousness and openness and the motive to achieve success and the motive to achieve power is expected (H2); In the adolescent sports population, a negative linear relationship between the personality traits of agreeableness, neuroticism and conscientiousness and the task orientation is expected (H3).

The conducted research has several methodological limitations which should be taken into account while interpreting the obtained results. The sample of only male participants was relatively small and pertinent, which reduces the possibility of generalizing the obtained results to the entire adolescent volleyball population in Serbia. Although the testing was anonymous and participants were asked to answer honestly, it is possible that they gave socially desirable answers, which is why it is better to statistically control them as a covariate. The methodological limitation refers to the application of self-assessment measures on the measuring instruments. It is important to note that a statistically significant, but low in intensity, linear connection between the variables was obtained in this correlational research. Additionally, the research design is transversal, the examination was carried out at one point in time, which is why it is not possible to identify the individual development trends of an individual, to examine the structure of their interdependencies, and to reach a conclusion about the causal relationships of the used variables.

Finally, despite the impossibility of generalizing and accepting general conclusions, based on the findings, the aforementioned methodological limitations in this rather unexplored field, this study leaves room for future longitudinal research, with a minimum of three measurement points, which should include a larger number of athletes of different age, as well as other assessment measures such as coaches on the given measuring instruments.

CONCLUSION

This empirical research has, in most cases, confirmed the findings of previous research on the relationship between personality traits and dimensions of motivation. The obtained findings on a sample of junior volleyball players confirmed that the applied questionnaires have satisfactory reliability of the internal consistency type, and that they can be used to assess the adolescent sports population and in the Serbia. The research results have identified a large number of statistically significant correlations (from low to moderate) between the dimensions of personality and various dimensions of motivation. Also, the main canonical findings in this study signal the existence of significant interdependencies between predictors (certain personality traits) and criteria (dimensions of motivation). The two extracted statistically significant canonical functions, with the risk of error of estimate of 3%, showed significant correlations between the two systems of the examined variables (Big Five personality traits model) and dimensions of motivation. The first pair of isolated canonical factors, along with 37% of the total variability explained, in the set of dimensions of the five-factor personality model, is defined by the predictor variables conscientiousness, extraversion and openness, and the set of the dimensions of motivation, the motive to achieve dominance, is defined by the criterion variables: the motive to achieve success and task orientation, which indicates a tendency towards the approaching behavior pattern of volleyball players. The first latent canonical variable can be interpreted as conscientiousness, extraversion and openness – motive to achieve power, success and task orientation. The second isolated pair of canonical factors on the negative pole in the set of personality traits is determined by the variables neuroticism, agreeableness and conscientiousness, and on the positive pole is the set of the dimensions of motivation: motive for avoiding failure and goal orientation. It is assumed that this latent canonical structure from the “Big Five” model channels the behavior of volleyball players with the aim of avoiding failure and goal orientation. The second latent canonical variable can be interpreted as neuroticism, agreeableness and conscientiousness – motive for avoiding failure and goal orientation.

Considering that in our speaking area, the relationship between the “Big Five” model of personality factors and dimensions of motivation has not been investigated on a sample of young athletes, this research has significant scientific and practical implications. Future research should focus on examining other potential determinants of personality dimensions of athletes in the junior category, which were not included in this empirical research. Such studies with a longitudinal design can, with a high probability, improve the motive of sport motivation and ego orientation in sport in the volleyball adolescent population.

REFERENCES

- Bureau, J. S., Guay, F., Plamondon, A., Ratelle, C. F., Howard, J. L., & Gilbert, W. (2023). Empirical testing of an alternative modeling of the self-determination continuum. *Motivation and Emotion*, 47(1), 46–60. <https://doi.org/10.1007/s11031-022-09976-9>
- Castillo, I., Molina-García, J., Estevan, I., Queralt, A., & Álvarez, O. (2020). Transformational Teaching in Physical Education and Students' Leisure-Time Physical Activity: The Mediating Role of Learning Climate, Passion and Self-Determined Motivation. *Int. J. Environ. Res. Public Health*, 17, 4844.
- Cook, R. H., Griffiths, M. D., & Pontes, H. M. (2020). Personality Factors in Exercise Addiction: A Pilot Study Exploring the Role of Narcissism, Extraversion, and Agreeableness. *International Journal of Mental Health and Addiction*, 18(1), 89–102. <https://doi.org/10.1007/s11469-018-9939-z>
- Costa, Y., Lopes da Silva, B. S., Miarka, B., Soares-Silva, E. L., & Batista, G. R. (2024). Análisis de las variables psicológicas vinculadas al rendimiento en voleibol playa: una revisión integradora y recomendaciones prácticas. *Cuadernos de Psicología del Deporte*, 24(1), 39–59. <https://doi.org/10.6018/cpd.582951>
- Crewther, B. T., Obmiński, Z., Turowski, D., & Szczepańska, B. (2024). Associations between the Big Five personality traits, testosterone, and cortisol in adolescent male athletes. *Biology of Sport*, 41(1), 279–286. <https://doi.org/10.5114/biolsport.2024.127390>
- Dattalo, P. (2014). *A demonstration of canonical correlation analysis with orthogonal rotation to facilitate interpretation*. Unpublished manuscript, School of Social Work, Virginia Commonwealth University, Richmond, Virginia.
- Dominski, F. H., Serafim, T. T., Siqueira, T. C., & Andrade, A. (2021). Psychological variables of CrossFit participants: a systematic review. *Sport Sciences for Health*, 17(1), 21–41. <https://doi.org/10.1007/s11332-020-00685-9>
- Duda, J.L., & Whitehead, J. (1998). Measurement of goal perspectives in the physical domain. In J. L. Duda (Ed.), *Advances in sport and exercise psychology measurement* (pp. 21–48). Morgantown, WV: Fitness Information Technology.
- Elsborg, P., Appleton, P., Wikman, J. M., & Nielsen, G. (2023). The associations between motivational climate, basic psychological needs and dropout in volleyball – A comparison across competitive levels. *European Journal of Sport Science*, 23(3), 393–403 <https://doi.org/10.1080/17461391.2022.2041100>
- Fabbricatore R., Iannario M., Romano R., & Vistocco D. (2021). Component-based structural equation modeling for the assessment of psycho-social aspects and performance of athletes. *Advances in Statistical Analysis*, 107, 343–367. doi: 10.1007/s10182-021-00417-5
- Fong, M., Zhao, K., & Smillie, L. D. (2021). Personality and competitiveness: Extraversion, agreeableness, and their aspects, predict self-reported competitiveness and competitive bidding in experimental auctions. *Personality and individual differences*, 169, 109907. <https://doi.org/https://doi.org/10.1016/j.paid.2020.109907>
- Godfrey, T. U., Uwa, K. L. & Akpan, A. (2024). *Personality Traits and Academic Performance of Students in Akwa Ibom State University, Nigeria*. *International Journal*

of *Business and Management Review*, 12(1), 21–37.
<https://doi.org/www.eajournals.org/>

Guntoro, T.S., Sutoro, P., Kurdi, N. Z., & Setiawan, E. (2023). The role of anthropometry, physical, psychological and personality for elite athletes in competitive sports. *Pedagogy of Physical Culture and Sports*, 27(4), 331–339.
<https://doi.org/10.15561/26649837.2023.0409>

Ivanović, M., & Ivanović, U. (2018). Gender differences during adolescence in the motives for physical exercise, depression, anxiety and stress [Polne razlike u adolescenciji u motivima za fizičko vežbanje, depresiju, anksioznost i stres]. *Exercise and Quality of Life EQQOL Journal*, 10(1), 17–22.

Ivanović, M., & Ivanović, U. (2023a). Korelacija postupaka trenera, motivacione atmosfere i intrinzne motivacije kod košarkaša kadeta [Correlations between coaching behavior, motivational climate and intrinsic motivation in cadet basketball players], *Homosporticus*, 2(1), 4–12.

Ivanović, M., & Ivanović, U. (2023b). Dimenzije ličnosti i kvalitet vršnjačkih odnosa fudbalera kadeta – determinante samopoštovanja [Dimensions of personality and the quality of peer relationships between cadet football players – determinants of self-esteem] U V. Stanković, Lj. Lilić, & B. Cicović (Ed.), *Zbornik sažetaka 10. međunarodne konferencije „Antropološki i teoantropološki pogled na fizičke aktivnosti“* (str. 29 – 36). Leposavić: Fakultet za sport i fizičko vaspitanje, Univerzitet u Prištini – Kosovska Mitrovica.

Ivanović, M., Milosavljević, S., & Ivanović, U. (2015). Faktorska struktura relacija agresivnosti i dimenzija ličnosti karatista juniora. [Factorial structure of the relationship between aggressiveness personality dimensions in junior karatekas]. *Facta universitatis, Series: physical education and sport*, 13(3), 371–381.

Ivanović, M., & Ivanović, U. (2021). Struktura relacija petofaktorskog modela ličnosti i motivacionih dimenzija kod karatista juniora [The structure of relations between five-factor model and dimensions of motivation among junior karatekas], *Sport - Nauka i Praksa*, 11(2), 67–75. <https://doi.org/10.5937/snp21020671>

Laborde, S., Allen, M. S., Katschak, K., Mattonet, K., & Lachner, N. (2020). Trait personality in sport and exercise psychology: A mapping review and research agenda. *International Journal of Sport and Exercise Psychology*, 18(6), 701–716.
<https://doi.org/10.1080/1612197X.2019.1570536>

Lebuda, I., Zielińska, A., Gołąb, D., & Jankowska, D. M. (2023). Interpersonal relationships, social emotions, and creativity. In Z. Ivcevic, J. D. Hoffmann, & J. C. Kaufman (Eds.), *The Cambridge handbook of creativity and emotions* (pp. 299–320). Cambridge, UK: Cambridge University Press.

Moritz, S. E., Feltz, D. L., Fahrback, K. R., & Mack, D. E. (2000). The Relation of Self-Efficacy Measures to Sport Performance: A Meta-Analytic Review. *Research Quarterly for Exercise and Sport*, 71(3), 280–294.
<https://doi.org/10.1080/02701367.2000.10608908>

Oliver, P. J., Avshalom, C., Richard, W. R., Terrie, E. M., & Stouthamer, L. (2024). The “Little Five”: Exploring the Nomological Network of the Five-Factor Model of Personality in Adolescent Boys. *Child Development*, 65(1), 160–178
<https://doi.org/10.1111/j.1467-8624.1994.tb00742.x>

Piepiora, P. (2021). Personality profile of individual sports champions. *Brain and Behavior*, 11(6), 1–10. <https://doi.org/10.1002/brb3.2145>

Rogowska, A. M. (2020). Personality differences between academic team sport players and physical education undergraduate students. *Physical Education of Students*, 24(1), 55-62. <https://doi.org/10.15561/20755279.2020.0107>

Ryan, R.M., & Deci, E.L. (2000a). When rewards compete with nature: the undermining of intrinsic motivation and self-regulation. In C. Sansone & J.M. Harackiewicz (Eds.), *Intrinsic and extrinsic motivation: The search for optimal motivation and performance* (pp. 13-54). New York: Academic Press.

Tabachnick, B. G., & Fidell, L. S. (2013). *Using Multivariate Statistics* (6th ed.). Boston, MA: Pearson.

Turda, E. S. (2024). The Relationship Between Personality Factors, Vocational Identity and Career Decision-Making Self-Efficacy. *International Journal for Research in Vocational Education and Training (IJRVET)*, 11(1), 55–75. <https://doi.org/10.13152/IJRVET.11.1.3ISSN:2197-8646><https://www.ijrvet>

Utashev, K. (2024). Fundamentals of introducing a mass sports movement through theoretical analysis of the daily physical activity of schoolchildren. *Mental Enlightenment Scientific-Methodological Journal*, 5(01), 298–215. <https://doi.org/10.37547/mesmj-V5-11-29>

Willis, J. D. (1982). Three Scales to Measure Competition-Related Motives in Sport. *Journal of Sport Psychology*, 4, 338–353.

Yıldız, M., & Eldeleklioğlu, J. (2024). Relations between perceived social support, attachment and kindness in high school students. *Journal of Pedagogical Research*, 8(1), 120–142 <https://doi.org/10.33902/JPR.202425168>

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