PHYSICAL EDUCATION OF STUDENTS

ORIGINAL ARTICLE

Personality traits and sporting level of athletes

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Abstract

Background and Study Aim: Personality traits significantly influence athletic performance and the development of athletes. However, these traits vary at different levels of sport. This knowledge gap makes it difficult to effectively tailor training and support programs. Thus, the purpose of this article is to identify differences in the expression of personality traits among professional athletes, competitive athletes, and amateur athletes.

Material and Methods: The respondents (N=83) were sport seniors from Poland, aged 23 years, studying at the Wroclaw University of Health and Sport Sciences. They were classified into three groups: 1) n=23 professional athletes; 2) n=30 competitive athletes; and 3) n=30 amateur athletes. The Big Five model was used, and the NEO-FFI personality questionnaire was administered. Analyses were performed using IBM SPSS Statistics 27.0, with a statistical significance level set at $\alpha = 0.05$.

Results: Differences in neuroticism intensity among athletes from different sport levels were noted. Professional athletes showed the lowest level of neuroticism. However, no differences were observed in the intensity of individual personality traits among athletes by gender. Furthermore, correlations were noted between sport level and athletes' personality traits: neuroticism (strong and negative), extraversion (weak and positive), and conscientiousness (weak and positive).

Conclusions: Findings underscore the importance of considering personality traits when developing tailored training and support programs for athletes. The absence of gender differences in personality traits suggests that such programs can be designed without gender-specific adjustments. The identified correlations between sport level and personality traits provide valuable insights for coaches and sport psychologists to better understand and support athletes' psychological profiles.

Keywords: sports psychology, Big Five, professional athletes, competitive athletes, amateur athletes

Introduction

Athletic performance and development are profoundly influenced by personality traits, yet these traits exhibit significant variability across different levels of sport. This variability presents a challenge in tailoring effective training and support programs for athletes. Understanding these differences is crucial for optimizing performance and psychological well-being. Additionally, the cultural context in which sports are perceived by different societies adds another layer of complexity to how personality traits manifest in athletes.

A contemporary cultural issue is the perception of sport by different societies. In this context, various studies indicate possible directions for addressing this issue. In a global perspective, the term qualified sport is known [1]. This means participating in a sporting competition organised by a particular sporting discipline organisation or a body acting on its behalf. In Poland, in physical culture sciences, there is a division into three levels: professional sport, competitive sport, and amateur sport [2].

Professional sport means training and competing in sport as if providing work or services for remuneration [3]. Whether or not there is a formal employment contract between the professional athlete and a certain sports organization is irrelevant here. The remuneration exceeds the costs of training and participating in sporting competitions and constitutes a significant part of the athlete's income [4]. Additionally, there are professional athletes who participate in sports competitions while being employed by uniformed services, such as the army, police, border guards, and firefighters. Such athletes receive the salary of a uniformed employee, but their primary job is to represent the country at international sports competitions [5]. Competitive sport, on the other hand, is undertaken voluntarily through competition for maximum sporting performance. The essence here is performance, achieving something more through competition [6]. Competitive athletes work in the economic sector for their livelihood. They do not have financial contracts with clubs and are not on the payroll. In Poland, the standard is that a competitive athlete works from morning until noon and only trains in the afternoon [7]. In contrast, amateur sport is a voluntary competition undertaken for active leisure and entertainment. What is important here is that the amateur athlete has the ambition to break personal records, but they do not subordinate their

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life to sport. Sporting activity is merely an addition to their life [8].

This cultural problem concerns the organizational division of sport into professional (for profit) and amateur (for pleasure) [9]. In this sense, professional athletes and competitive athletes compete in professional sports organizations, while amateur athletes compete in amateur sports organizations. However, there are also sports, such as triathlon and long-distance running, in which professional, competitive, and amateur athletes participate in the same competition. Moreover, in less developed countries, there have been instances where the core of the national team for a particular World Championships or Olympic Games is made up of both professional athletes and amateurs.

The problem described above may influence the personalities of athletes [10]. Professional, competitive, and amateur athletes, like other people, shape their personalities through experiences, interpersonal contacts, social roles, and repeated situations [11, 12, 13]. Therefore, one may assume that athletes from different sport levels will not differ in the intensity of personality traits. However, one could also assume the opposite: that athletes from different sport levels differ in the intensity of personality traits because they have different lifestyles. This issue remains relevant in physical culture sciences, particularly in the areas of sport psychology and sport theory [14, 15, 16].

Previous results in this area have referred to the relationship between personality and sports performance. The distribution of the neuroticism trait has been shown to be important in taking up sports activities. Lower levels of neuroticism are associated with better sports performance [17]. More successful athletes tend to show higher emotional stability than less successful athletes [18]. A significant relationship between neuroticism and sports performance is also found among disabled athletes [19]. This trait is the most frequently evaluated in studies on sport and exercise psychology [20]. At the same time, it is the most common mediator of associations with stress coping styles [21]. However, analyses of global studies show that, in addition to neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness are also positively correlated with sports performance [22]. Moreover, greater sports experience translates into a more pronounced personality, including lower neuroticism [23]. Therefore, it is reasonable to verify the relationship between personality traits and sporting level. This will either solidify previous results or demonstrate new regularities. In view of the above, the aim of this article was to acknowledge the differences and relationships among professional athletes, competitive athletes, and amateur athletes in the intensity of personality traits.

Materials and Methods

Participants

Eighty-three sport seniors from Poland aged 23 took part in the study. They all held a bachelor's degree and had ten years of experience in sporting competition. The respondents were master's students of sport at the Wroclaw University of Health and Sport Sciences. Among them were 23 professional athletes (including 10 females and 13 males who hold a master class in sport), 30 competitive athletes (including 15 females and 15 males who hold a master or first sports class), and 30 amateur athletes (including 17 females and 13 males). These homogeneities determined the division of the respondents into three groups: professional athletes (n=23), competitive athletes (n=30), and amateur athletes (n=30). Each group included athletes from combat sports (judo, kickboxing, wrestling), individual sports (athletics, modern dance, bodybuilding, fitness, swimming), and team sports (football, handball, basketball, volleyball). Satisfactory numbers of variables by sport were not achieved, so this study is limited to a case study of professional athletes, competitive athletes, and amateur athletes from the Wroclaw University of Health and Sport Sciences. The surveyed professional and competitive athletes had Polish and international successes in leading sports organizations in their respective sports. Similarly, the amateur athletes had Polish and international success in amateur sports organizations. Their behavior was within the norm, and they did not show any disorders.

Research Design

The Big Five model was used, which is nowadays regarded as the most reliable and tested theory of personality traits. This model considers five dimensions as the theoretical construct of personality, each of which has an opposite pole. These dimensions are: neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness [24]. Together, they provide a comprehensive description of the human personality. The intensity of these dimensions is measured on a scale from 1 to 10 sten. The Big Five dimensions exist in real life and are relevant to an individual's adaptation to the environment. They are invariant, universal, and have a high degree of heritability [25]. The NEO-FFI personality questionnaire, which has applications in both theoretical and applied sport psychology, was chosen as the tool. The NEO-FFI is a shortened version of the NEO-PI-R used in clinical research.

Therefore, the NEO-FFI provides only the most important information within the five main factors—neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness—

without their components. The NEO-FFI consists of 60 self-report statements. The truthfulness of these statements in relation to the self is assessed by the respondent on a five-point scale. Each dimension consists of 12 statements. The NEO-FFI has specific norms that relate to gender and age in the ranges of 15-19 years, 20-29 years, 30-39 years, 40-49 years, and 50-80 years [26]. Due to the age of the subjects, the NEO-FFI norms for ages 20-29 were adopted. The internal consistency of the measurement scales was verified. The following Cronbach's alpha reliability coefficients were obtained: 0.88 (neuroticism), 0.78 (extraversion), 0.59 (openness to experience), 0.63 (agreeableness), and 0.85 (conscientiousness). The coefficients for neuroticism and conscientiousness are highly satisfactory.

The study was conducted in January 2023 at the Wroclaw University of Health and Sport Sciences. The athletes were queried during a sport psychology class, in a room isolated from noise and well-lit. The inclusion criteria for the athletes were a voluntary and written willingness to participate in the study and a documented record of achievement at the relevant sporting level. All respondents also gave their consent for the results obtained to be used, with full anonymity, for scientific research purposes by the Wroclaw University of Health and Sport Sciences. Prior to completing the NEO-FFI, the subjects were given instructions on how to complete the questionnaire. The athletes completed the NEO-FFI within 60 minutes. Each respondent was individually briefed on their results, followed by a discussion. After these activities, the data were coded and prepared for analysis. The entire procedure was carried out in accordance with the Declaration of Helsinki. The research received approval from the Senate Committee for Research Ethics at the Wroclaw University of Health and Sport Sciences, number 20/2019.

Statistical Analysis

Statistical analyses were performed using IBM SPSS Statistics 27.0 software. The program conducted analysis of basic descriptive statistics, one-way analysis of variance, tests of differences for independent samples, and Spearman rank correlations. The level of statistical significance in the analyses was set at $\alpha = 0.05$. A sensitivity analysis of the statistical test was also performed to determine the minimum power of the effect (sensitivity analysis for computing required effect size). With a test sample size of N = 83, a significance level of $\alpha = 0.05$, and a statistical power of the test corresponding to 95%, it was possible to detect an effect size of $\eta^2 = 0.14$ (Cohen's f = 0.40).

Results

In the first step of the analysis, basic descriptive statistics were performed along with a normality test of the distribution. The analyses used results converted into stens according to the applicable norms (Table 1).

Within the analysis carried out, it was observed that the distribution of the variables follows a normal distribution. The exception is the distribution of agreeableness ($p = 0.037$), but by analyzing the low skewness value (Sk. < 1), it can be concluded that the distribution of this variable does not deviate significantly from the normal distribution. Therefore, it is reasonable to use parametric tests. In the next step of the analysis, the intensity of individual personality traits was compared between the sport levels of professional (n = 23), competitive (n = 30), and amateur (n = 30) athletes.

The compared groups are equal, $\chi^2(2) = 1.18$, $p = 0.554$. An equal gender distribution was also observed in the compared groups, $\chi^2(2) = 0.91$, $p = 0.634$. A one-way ANOVA was performed as part of the analysis. The dependent variable was individual personality traits, while the independent variable was the level of the athletes. The analysis showed that there were differences between athletes of different sport levels in the severity of neuroticism, $F(2,82) = 36.04$, $p < 0.001$. The observed effect size is large, $\eta^2 = 0.474$ (Table 2). Post-hoc analysis (Table 3) showed that professional athletes significantly differed in neuroticism intensity (M = 10.70) from competitive athletes (M = 21.00) and from amateurs (M = 22.23). In addition, competitive athletes also have lower levels of neuroticism than amateurs.

In the next step, the intensity of individual personality traits was compared by the gender of

Table 1. Basic descriptive statistics including normality of distribution test.

Dependent variable	M	Mdn	SD	Sk.	Kurt.	Min.	Max.	W	p
Neuroticism	20.40	20.00	9.59	0.24	0.20	0.00	46.00	0.98	0.353
Extraversion	31.22	31.00	7.02	-0.09	-0.26	14.00	48.00	0.99	0.664
Openness	26.39	26.00	5.70	0.39	-0.58	15.00	39.00	0.97	0.037
Agreeableness	30.20	30.00	5.34	-0.17	-0.79	19.00	40.00	0.97	0.079
Conscientiousness	32.57	33.00	7.81	-0.06	-0.55	13.00	48.00	0.98	0.342

M - mean; Mdn - median; SD - standard deviation; Sk - skewness; Kurt - kurtosis; Min - the lowest value of the set; Max - the highest value of the set; W - Shapiro-Wilk test; p - significance level.

Table 2. Comparison of amateur, competitive and professional athletes in terms of individual personality traits.

Dependent variable	Professionals (n = 23)		Competitive (n = 30)		Amateurs (n = 30)		F(2, 82)	p	η^2
	M	SD	M	SD	M	SD			
Neuroticism	10.70	6.27	21.00	5.00	22.23	9.06	36.04	<0.001	0.474
Extraversion	33.61	5.38	31.53	7.63	29.07	7.07	2.90	0.061	0.068
Openness	26.13	5.72	26.90	5.35	26.07	6.16	0.19	0.829	0.005
Agreeableness	30.78	4.85	29.83	6.17	30.13	4.95	0.21	0.815	0.005
Conscientiousness	35.52	7.81	32.00	7.68	30.87	7.87	2.53	0.086	0.059

M– mean; SD– standard deviation; F - ANOVA test statistics; p - significance level; η^2 - eta square.

Table 3. Multiple comparisons of the level of intensity of individual personality traits among athletes from different sport levels.

Level	Neuroticism	Extraversion	Openness	Agreeableness	Conscientiousness
Professionals - Competitive	10.30[b]	-2.07	0.77	-0.95	-3.52
Professionals - Amateurs	16.54[b]	-4.54	-0.64	-0.65	-4.65
Competitive - Amateurs	6.23[b]	-2.47	-0.83	0.30	-1.13

b - significant difference between groups (p<.001) adjusted by the Bonferroni method.

Table 4. Comparison of standardised scores of severity of personality traits by gender of respondents

Variables	Female (N = 42)		Male (N = 41)		t	p	d
	M	SD	M	SD			
Neuroticism	4.79	2.32	4.63	2.35	-0.29	0.768	-0.065
Extraversion	6.48	2.31	6.76	1.94	0.60	0.553	0.131
Openness	4.60	1.87	4.80	1.82	0.52	0.607	0.113
Agreeableness	5.76	2.21	6.41	2.00	1.41	0.162	0.310
Conscientiousness	6.76	2.30	6.71	2.16	-0.11	0.911	-0.025

M - mean; SD - standard deviation; t - Student's t-test; p - significance level; d - average deviation.

the subjects. For this purpose, the standardized results for women (n = 42) and men (n = 41) were compared using the Student's t-test for independent samples. No difference in the intensity of individual personality traits was observed between men and women (Table 4).

In the last step of the analysis, the existence of a relationship between sport level and the intensity of the athletes' personality traits was verified. The analysis showed a strong (rho > 0.6) and negative correlation between sport level and neuroticism, rho(82) = -0.65, p < 0.001. A weak (rho < 0.3) and positive correlation was also observed between sport level and extraversion, rho(82) = 0.26, p = 0.018, and between sport level and conscientiousness, rho(82) = 0.22, p = 0.043 (Table 5).

Discussion

The results of the study provide new insights in the areas of sport psychology and sport theory. One difference in the intensity of personality traits was detected in the studied population of Polish athletes: professional, competitive, and amateur. The hypothesis was verified, and the studied groups differed significantly, but only in the intensity of neuroticism. Professional athletes

Table 5. Correlations between sporting level and personality traits of athletes

Variable		Level	1.	2.	3.	4.
1. neuroticism	Spearman's *rho*	**-0.654****				
	relevance	**<0.001**				
2. extraversion	Spearman's *rho*	**0.259***	**-0.386****			
	relevance	**0.018**	**<0.001**			
3. openness	Spearman's *rho*	0.030	-0.13	**0.261***		
	relevance	0.800	0.258	**0.017**		
4. agreeableness	Spearman's *rho*	0.050	-0.08	0.02	0.030	
	relevance	0.682	0.490	0.862	0.765	
5. conscientiousness	Spearman's *rho*	**0.223***	**-0.271***	0.160	0.140	0.040
	relevance	**0.043**	**0.013**	0.159	0.220	0.725

Note: * - $p < 0.05$; ** - $p < 0.001$

showed a lower intensity of neuroticism compared to competitive athletes and amateurs. Competitive athletes also showed lower neuroticism intensity compared to amateur athletes. Furthermore, the strong and negative correlation between sport level and neuroticism confirmed these significant differences. In contrast, the weak and positive correlations between sport level and extraversion, and between sport level and conscientiousness, do not contribute significantly, as no significant differences were observed in the intensity of these traits in the study population. This means that higher levels of sports performance are associated with lower neuroticism. That is, professional athletes, compared to competitive and amateur athletes, are more emotionally stable and better able to cope with difficult life situations. They are also more satisfied with themselves and have a greater sense of security. Stressful situations are unlikely to make them nervous or throw them off balance. They are more calm, balanced, and relaxed. The same description applies to the relationship between competitive athletes and amateur athletes. It is also important to note that the studied population does not differ in the intensity of personality traits by gender. Therefore, a low intensity of neuroticism may also occur in women's sports and be one of the conditions necessary for an athlete to reach a higher sporting level.

The above indicates that the distribution of the trait of neuroticism remains important in undertaking sports activities. The lowest intensity of this trait among professional athletes shows that these individuals have managed their negative emotional states through constant training and competition, as their sports environment functions as a working environment [27, 28]. In contrast, the higher intensity of neuroticism among competitive athletes relates to their different functioning. For these individuals, the sports environment is not a working environment. On one hand, there is a tendency to maximize athletic performance through training and competing [29, 30], and on the other hand, there is a burden of responsibilities and work problems, often linked to finding funding to compete [31]. In contrast, the slightly higher intensity of neuroticism among amateur athletes emphasizes the impact of physical activity on individuals who occasionally engage in sport competition [32] and highlights the differences between those who participate in sport competition systematically [33, 34]. Accordingly, the positive aspects of sport are favored, including the dissemination of educational values such as the idea of Olympism and the principles of fair play [35, 36], which shape the personality of athletes [37].

An earlier study on the relationship between personality and sports performance also indicated the relevance of neuroticism levels [17, 18, 19, 20, 21, 22, 22]. Moreover, gaining sports experience also translates into competitive proficiency and lower neuroticism [23]. In contrast, the results further solidified the importance of a low level of neuroticism and provided a new argument. The level of neuroticism among athletes can both enhance and undermine athletic competition. Professional athletes experience negative emotional states to a lesser extent, while competitive athletes experience them somewhat more. This translates into their athletic performance [38], abstracting from physiology, of course [39]. A lower level of neuroticism makes it possible to interpret the start situation positively. This is because negative emotional reactions are not perceived as debilitating, but as a positive state [40]. In contrast, athletes with higher levels of neuroticism are more likely to experience negative consequences of emotional states in sports competition [41]. Therefore, it should be noted that these emotional states can become habitual and ingrained in the athlete [42]. In addition, this may explain why athletes may be more prone to depression compared to the general

population, as they are constantly burdened by the physical and psychological demands placed on them by the sports environment [43]. This is compounded by extra-sport problems and, in the case of professional and competitive athletes, the added pressure of results [44]. Publicly judged performance, perceived acceptance in the sports community, risk-taking behavior, and eating disorders can increase the risk of developing common psychiatric disorders in athletes [45]. This is why the mental preparation of athletes for competition plays such an important role. It is crucial for the education of each athlete that, without exception, there is a mental coach or sports psychologist present in the coaching staff. A mental coach brings out an athlete's hidden potential by educating them in the use of psychological skills. A sports psychologist, on the other hand, has the competencies of a mental coach but can also provide comprehensive psychological support. Therefore, the promotion of this knowledge is beneficial for the overall health of athletes and for the effective management of sports training by coaches.

It is recommended to introduce psychological programs into the mental preparation of athletes aimed at the formation and maintenance of a healthy personality. A correctly managed process of personality improvement is extremely important, as it allows for the development and correction of disturbed traits. This, in turn, enhances the functioning of the athlete and their ability to maximize their sporting performance.

The present study is limited to a case study of Polish athletes aged 23 years, who were competitors in the following sports: judo, kickboxing, wrestling, athletics, modern dance, bodybuilding, fitness, swimming, football, handball, basketball, and volleyball from different sport levels. These athletes were master's students in sport at the Wroclaw University of Health and Sport Sciences. The small size of the sample for each sport discipline did not allow for the verification of differences between the intensity of personality traits and sport level in specific sports, but only refers to general differences between professional, competitive, and amateur athletes. Therefore, the results must be related to a specific place, time, and population. The lack of this knowledge makes it impossible to verify the metacognitive question: what personality traits did the subjects have before they started sporting activities, and did these traits influence their choice of a specific sport?

In view of the relevance of the issue of personality in sport psychology and sport theory, this subject matter should be continued. Research work should be carried out on as large a scale as possible, taking into account nationality, gender, and age, across all contemporary sports. In this sense, the results obtained may serve as a pilot for larger-scale studies.

Conclusions

The study highlights the importance of considering personality traits in sport psychology and sport theory. It is evident that the level of neuroticism significantly influences athletic performance, with lower levels being characteristic of professional athletes, contributing to better emotional stability and stress management. This underscores the need for integrating psychological programs into the training of athletes aimed at developing and maintaining healthy personality traits. Furthermore, the findings suggest that future research should be conducted on a larger scale, considering variables such as nationality, gender, and age across various sports. These results can serve as a pilot for more extensive studies, enhancing our understanding of the role of personality in athletic success.

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