

Personality profile of athletes practising endurance disciplines

Paweł Piepiora*, Juliusz Migasiewicz, Dominika Napieraj

***Corresponding author:** Paweł Piepiora, University School of Physical Education in Wrocław, Faculty of Sport Sciences, Chair of Sport Didactics, Combat Sports Team, I. J. Paderewskiego 35 street, Multifunctional Sports Hall room 73, 51-612 Wrocław, Poland, phone: +48 605 39 54 32, e-mail: pawel.piepiora@awf.wroc.pl

Conflict of interest statement: the authors declare that there is no conflict of interest

Affiliation: University School of Physical Education in Wrocław, Faculty of Sport Sciences, Chair of Sport Didactics

Abstract

This paper concerns issues in the field of sport psychology. The purpose of the study was to determine the personality profile of athletes practising endurance disciplines – an individual one and a team one. The five-factor NEO-FFI personality inventory was used. The study involved senior-age men (N=60) engaged in the competitive practice of long-distance running (n=30) and football (n=30). It was demonstrated that long-distance runners are characterised by an average level of neuroticism, extraversion, openness to experience and agreeableness and a high level of conscientiousness, while football players are different from the former, to a statistically significant degree, with regard to neuroticism and extraversion (higher in football players) and conscientiousness (higher in runners). The personality profile of long-distance runners differs from that of football players. The biggest discrepancies were revealed on the conscientiousness scale. A significant impact of the sport discipline practised on the personality profile of athletes was confirmed.

Key words: sport psychology, personality profile, endurance disciplines, long-distance running, football

Introduction

Long-distance running includes individual track and field events, covering 3000-metre, 5000-metre and 10,000-metre runs, marathon (42,195 metres) and a 3000-metre steeplechase (Nielsen, 2013). All of the above are regarded as endurance disciplines in

competitive sport (together with middle-distance 800-metre and 1500-metre runs). They are (apart from the 3000-metre steeplechase) Olympic Game events (Williams, 2009). In addition, road running competitions are held, which (except marathon) are not included in the programme of any of the largest sporting events of the four-year period (Matthews, 2018).

Football is considered a strictly endurance team discipline and shares many characteristics with long-distance running (Reilly, 1996), as the aerobic capacity occupies an important place in the motor preparation of athletes. It not only constitutes the physiological basis for long-term effort, but also significantly facilitates acceleration and results in more effective functioning of regeneration processes that accompany intense intermittent effort (Davis and Brewer, 1992; Davis and Brewer, 1993). A high level of aerobic endurance enables a player to achieve higher intensity during a match and to maintain it for an extended period of time, which directly translates into his or her play effectiveness. The leading players of the world's best teams cover a distance of 11 to 14 kilometres during a match, which depends on, among other things, the level of training or the player's position in the field (Eston et al., 2005).

Competitive sport is very demanding of an athlete. The higher the level of competition, the more subtle factors determine his or her success. It would seem that, in the process of selection for a particular discipline, the physical predispositions will be the decisive factor. However, only a comprehensive assessment of a given person, including his or her psychological profile, can provide a full picture of that person's potential and, as a result, increase the chances of it being actually utilised (Piedmont et al., 1999; Blecharz and Siekańska, 2005). The issue of personality in sport occupies quite a significant area in the literature on the subject. The trait theory is considered the most appropriate in the field of sport psychology (Brewer, 2009), as it pays particular attention to the impact of genes on a person's individuality. It assumes the existence of key traits or certain immutable characteristics. Exhibiting such traits or characteristics depends, to a significant degree, on one's genetic features and they are expressed by means of frequency, intensity and the range of circumstances in which they can be used (Backmand et al., 2003; McKelvie et al., 2003; Anghel et al., 2009; Shrivastaval et al., 2010; Allen et al., 2011). The purpose of this study was to attempt to determine the personality profile of athletes practising endurance disciplines.

Methodology

The best Polish long-distance runners were purposefully selected for the study (n=30; see Table 1). That group included medal winners at World, European and Polish championships – members of the Polish national team. The second sample consisted of football players (n=30) from 2 LOTTO Ekstraklasa (*top Polish football league*) clubs, including four Polish national team players (see Table 2).

The tests were carried out on the athletes, using the NEO-FFI Personality Inventory, during training camps and sparring tournaments (Costa Jr and McCrae, 2007). The NEO-FFI questionnaire was characterised by internal consistency. A correlation was demonstrated between the Inventory results and observations made by bystanders and the heredity of traits as well as their relationship to other personality and temperamental dimensions (Wiggins, 1996). Moreover, the authors also confirmed in their study the relevance of the factors considered, their realness, invariance, universality and biological character (McCrae and Costa Jr, 2003). The statistical analysis was performed using the Statistica 13.1 program. The Mann-Whitney *U* test was used, where the central tendency measure is the median. The level of significance was set as the probability of $p < 0.05$. The study received the approval of the

Table 1. Basic descriptive statistics of long-distance runners.

Variable	Mean	Median	Min.	Max.	Lower quartile	Upper quartile	SD	CV
AGE	25.8	26	19	36	22	29	4.33	16.8
Neuroticism – raw score	14.3	13	6	37	9	17	7.35	51.43
Neuroticism – sten score	3.77	3.5	1	10	2	5	2.08	55.2
Extraversion – raw score	29.83	31	13	40	26	33	5.9	19.76
Extraversion – sten score	6.3	6.5	1	10	5	8	1.99	31.51
Openness to experience – raw score	25.37	23	14	41	20	29	6.8	26.81
Openness to experience – sten score	4.7	4	1	10	3	6	2.14	45.44
Agreeableness – raw score	28.83	31	13	40	24	33	6.57	22.79
Agreeableness – sten score	5.9	6.5	1	10	4	8	2.52	42.77
Conscientiousness – raw score	38	39	28	47	34	42	5.44	14.31
Conscientiousness – sten score	7.93	8	4	10	7	9	1.7	21.44

Table 2. Basic descriptive statistics of football players.

Variable	Mean	Median	Min.	Max.	Lower quartile	Upper quartile	SD	CV
AGE	22.3	22	16	31	22	23	2.65	11.9
Neuroticism – raw score	17.87	18	0	37	11	25	8.84	49.49
Neuroticism – sten score	4.73	5	1	10	3	6	2.38	50.22
Extraversion – raw score	33.27	34	18	41	30	37	5.45	16.39
Extraversion – sten score	7.4	8	3	10	6	9	1.79	24.23
Openness to experience – raw score	24.53	25	13	32	21	28	4.84	19.73
Openness to experience – sten score	4.43	5	1	7	3	6	1.55	34.89
Agreeableness – raw score	28.47	29	16	41	25	32	6	21.07
Agreeableness – sten score	5.9	6	2	10	5	7	2.26	38.38
Conscientiousness – raw score	31.13	34	9	45	27	36	8.49	27.26
Conscientiousness – sten score	6.33	7	1	10	5	8	2.47	38.97

Results

As a result of a statistical analysis using the Mann-Whitney U test – nonparametric and comparing two independent groups – values below the significance level adopted were obtained on the following three scales (both when examining raw scores and those converted into sten scores): neuroticism, extraversion and conscientiousness. The lowest scores are those related to conscientiousness, which means that it is this personality dimension that revealed the greatest differences between the groups studied. The exact values of the test probabilities obtained are shown in Table 3. The statistically significant scores are marked red.

Table 3. Values of test probabilities for individual personality traits.

	raw scores	sten scores
neuroticism	0.0425	0.0471
extraversion	0.0171	0.0257
openness to experience	0.9586	0.9880
agreeableness	0.6246	0.8345
conscientiousness	0.0009	0.0114

Presented below is a compilation of the mean values of raw scores for football players and long-distance runners (Fig. 1).

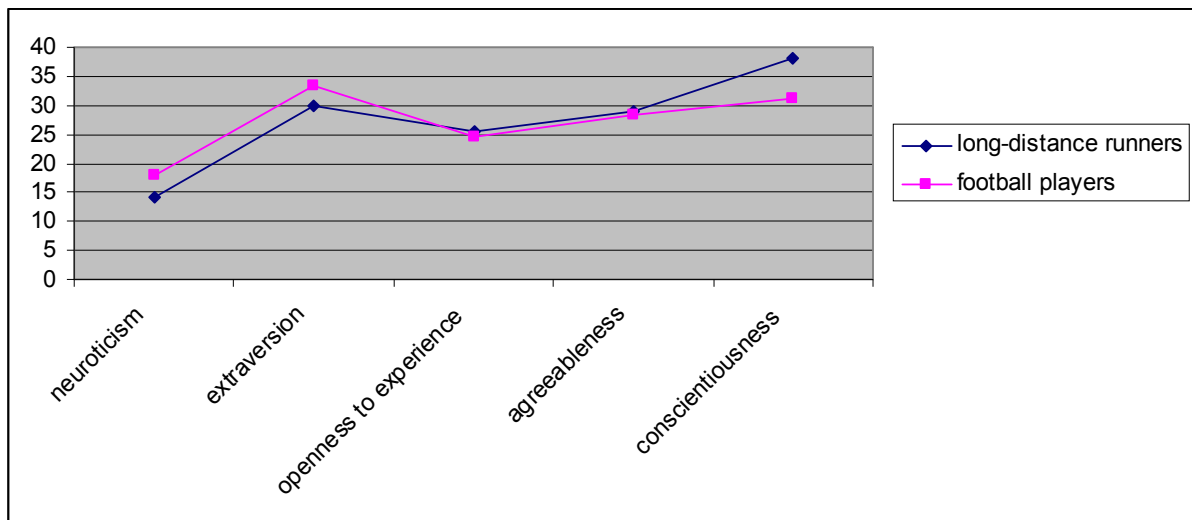


Fig. 1. Compilation of the mean values of raw scores for personality traits with regard to long-distance runners and football players.

Next the mean scores were compiled in the form of a chart (Fig. 2) after being converted into sten scores.

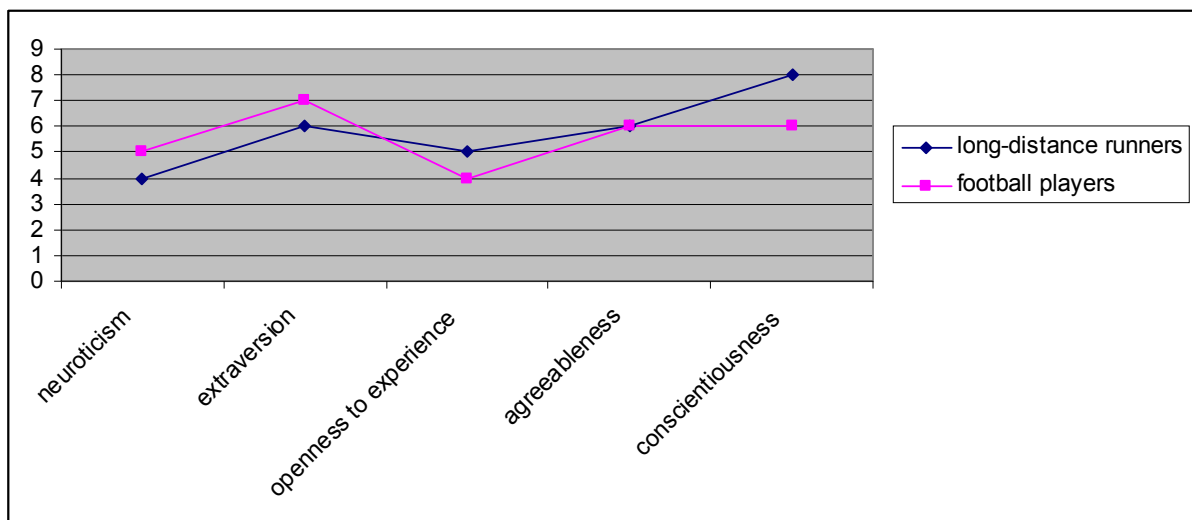


Fig. 2. Compilation of the mean values of sten scores for personality traits with regard to long-distance runners and football players.

According to the assumptions made by the authors of the NEO-FFI questionnaire, sten scores in the 1-3 range should be treated as low, those in the 4-6 range reflect an average result and those in the 7-10 range indicate a high intensity of the trait examined. Table 4 presents the interpretation of the results obtained.

Table 4. Interpretation of the results obtained for the groups examined.

	Neuroticism	Extraversion	Openness to experience	Agreeableness	Conscientiousness
Long-distance Runners	Average	Average	Average	Average	High
Football players	Average	High	Average	Average	Average

Discussion

The results obtained by runners (average level of neuroticism, extraversion, openness to experience and agreeableness and high level of conscientiousness) are strictly consistent with the psychological profile of a sport master (Zdebski and Blecharz, 2004; Ekinci and Hosany, 2006; Fuller, 2011; Allen et al. 2013, Boostani et al., 2013, Tomczak et al., 2013, Allen and Laborde, 2014; Piepiora and Piepiora, 2015; Piepiora et al., 2016a, 2016b; Piskorska et al., 2016; Piepiora et al., 2017). Long-distance running requires a large amount of conscientiousness on the part of athletes, as they work for their success on their own, without being able to count on assistance from their teammates in the case of a weaker disposition at a given moment and, thus, having a greater personal responsibility for the result. Patience and humility are extremely important in events of a typically endurance nature. One cannot rely solely on luck during a competition and the greatest battle often takes place in the athlete's head. However, given the importance of aerobic capacity in football, it must be admitted that these disciplines show similarities with respect to many aspects of personality. As regards the NEO-FFI scales this conclusion is justified by the level of openness to experience and agreeableness.

A different point of reference for the interpretation of the results obtained are studies on personality in relation to a type of sport situation (Kajtna et al., 2004; Shipley et al., 2007; John et al., 2008; Soto et al., 2008; Hill et al., 2010; Ilyasi and Salehian, 2011; Tok, 2011; Binboga et al., 2012; Tolea et al., 2012; Mirzaei et al., 2013; Terracciano et al., 2013; Piepiora and Witkowski, 2018; Piepiora et al., 2018). On their basis, it was found that athletes participating in non-contact events are significantly more neurotic and less conscientious than those engaged in contact disciplines, which introduces a certain dissonance to the interpretation of the results obtained, as an exactly opposite picture emerges from an analysis of the relationship between football players (contact sport) and long-distance runners (non-contact sport). Runners turned out to be significantly less neurotic and, at the same time, more conscientious. These differences must be due to the specific nature of the disciplines and the dissimilarities within the groups of athletes surveyed, which included bodybuilders, volleyball players, karatekas and football players. When looking at the descriptive statistics of raw scores for the football players in both studies, one clearly sees a significant discrepancy in the neuroticism and conscientiousness scales. It can be presumed that it was these individual differences that resulted in the contradictory findings. A significant impact of the sport discipline practised on the personality profile of athletes was confirmed. Sport psychologists have been trying, for some time now, to identify traits that distinguish athletes from non-training people and successful athletes from mediocre ones. There is no doubt that personality significantly affects sport performance and determines the choice of discipline. It is, however, worth emphasizing that personality is also shaped by the sport discipline practised, which contributes to an increase in one's self-confidence or overcoming of fears.

Conclusions

Long-distance runners differ in their personality profile from football players. Statistically significant differences were demonstrated in the levels of neuroticism, extraversion and conscientiousness. It is, however, worth emphasizing that the discrepancies in both the neuroticism and the extraversion scale are not large and the area in which the greatest disproportions were revealed is conscientiousness. This results from the specific nature of the sport discipline – individual or team – practised.

References

- Allen MS, Greenlees I, Jones M. An investigation of the five-factor model of personality and coping behaviour in sport. *Journal of Sport Sciences*, 2011; 29: 841-850.
- Allen MS, Greenlees I, Jones M. Personality in sport: a comprehensive review. *International Review of Sport and Exercise Psychology*, 2013; 6: 184-208.
- Allen MS, Laborde S. The role of personality in sport and physical activity. *Current directions in psychological science*, 2014; 23: 460-465.
- Anghel A, Banica I, Ionescu S. Personality features of elite athletes considering the criterion of the sport practiced. *Sport Science Review*, 2009; 1: 5-6.
- Backmand H, Kapiro J, Kujala U, et al. Personality and mood of former elite athletes: a descriptive study. *International Journal of Sports Medicine*, 2003; 22: 215-221.
- Brewer B. *Sport Psychology*. Chichester, UK: Wiley-Blackwell, 2009.
- Binboga E, Guven S, Catikkas F, et al. Psychophysiological responses to competition and the Big Five personality traits. *Journal of Human Kinetics*, 2012; 33: 187-194.
- Blecharz J, Siekańska M. Physical trauma and mental condition of the athlete. *Medicina Sportiva*, 2005; 9 (3): 1-6.
- Boostani MH, Boostani MA, Rezaei AM. Sport psychology in professional karate athletes: give psychological guidelines in order to improve their act in the competitions. *Annals of Biological Research*, 2013; 4 (1): 48-52.
- Costa Jr P, McCrae R. *Personality inventory Five Factor model test*. Warsaw: Pracownia Testów Psychologicznych, 2007.
- Davis JA, Brewer J. Physiological characteristics of an international female soccer squad. *Journal of Sports Sciences*, 1992; 10: 142-143.
- Davis JA, Brewer J. Applied physiology of female soccer players. *Sports Medicine*, 1993; 16: 180-189.
- Ekinci Y, Hosany S. Destination personality: An application of brand personality to tourism destinations. *Journal of Travel Research*, 2006; 45 (2): 127-139.
- Eston RG, Lamb KL, Parfitt G, King N. The validity of predicting maximal oxygen uptake from a perceptually-regulated graded exercise test. *European Journal of Applied Physiology*, 2005; 94 (3): 221-227.
- Fuller J. Martial arts and psychological health: Psychology and Psychotherapy. *British Journal of Medicine and Psychology*, 2011; 61 (4): 317-328.
- Hill DM, Hanton S, Matthews N, et al. Choking in sport: a review. *International Review of Sport and Exercise Psychology*, 2010; 3 (1): 24-39.
- Ilyasi G, Salehian MH. Comparison of personality traits between individual and team athletes. *Middle East Journal of Scientific Research*, 2011; 9 (4):527-530.
- John OP, Naumann LP, Soto CJ. Paradigm shift to the integrative Big-Five trait taxonomy: History, Measurement, and Conceptual Issues. In: John OP., Robins RW., Pervin LA., editors. *Handbook of personality: Theory and research*. New York, NY: Guilford Press, 2008: 114-158.

- Kajtana T., Tusak M., Barić R., Burnik S. Personality in high-risk sports athletes. *Kinesiology*, 2004; 36 (1): 24-34.
- McCrae R, Costa Jr P. *Personality in Adulthood: A Five-Factor theory perspective*. New York: Guilford Press, 2003.
- McKelvie SJ, Lemieux P, Stout D. Ekstraversion and neuroticism in contact athletes, no contact athletes and non-athletes: a research note. *Journal of Sport Psychology*, 2003; 5 (3): 19-27.
- Matthews P. *Athletics 2018: The International Track and Field Annual*. UK: Tankobon Softcover, 2018.
- Mirzaei A, Nikbakhsh R, Sharififar F. The relationship between personality traits and sport performance. *European Journal of Experimental Biology*, 2013; 3 (3): 439-442.
- Nielsen RO. Classifying running-related injuries based upon etiology with emphasis on volume and pace. *International Journal of Sports Physical Therapy*, 2013; 8 (2): 172–179.
- Piedmont RL, Hill D, Blanco S. Predicting athletic performance using the five factor model of personality. *Personality and Individual Differences*, 1999; 27: 769-777.
- Piepiora P, Ciężczyk I, Krzesiński M. Young athlete personality model using the example of selected sport disciplines. *Roczniki Naukowe Wyższej Szkoły Wychowania Fizycznego i Turystyki w Białymstoku*, 2017; 22 (4): 5-13.
- Piepiora P, Piepiora D, Witkowski K. Personality of the karatekas versus kumite sport fight systems (in view of the karate culture as the regulator of this interdependence). *Journal of Combat Sports and Martial Arts*, 2016a; 7 (1): 35-41.
- Piepiora P, Piepiora Z. The karate culture as the regulator of interdependence between permitted level of violence in different kumite systems and personality of contestants. *Human And Social Sciences at the Common Conference*, 2015; 3 (1): 23-27;
- Piepiora P, Szmajke A, Migasiewicz J, Witkowski K. The karate culture and aggressiveness in kumite competitors. *Ido Movement for Culture: Journal of Martial Arts Anthropology*, 2016b; 16 (2): 41-47.
- Piepiora P, Witkowski K. Personality traits of competitive athletes according to type of pressure exerted on opponents. *South African Journal for Research in Sport, Physical Education and Recreation*, 2018; 40 (1): 97-109.
- Piepiora P, Witkowski K, Piepiora Z. Personality profiles of karate masters practising different kumite styles. *Archives of Budo*, 2018; 14: 231-241.
- Piskorska E, Mieszkowski J, Kochanowicz A, et al. Mental skills in combat sports – review of methods anxiety evaluation. *Archives of Budo*, 2016; 12: 301-313.
- Reilly T. *Science and Soccer*. London: E & FN Spon, 1996.
- Shiple BA, Weiss G, Der G, et al. Neuroticism, extraversion and mortality in the UK Health and lifestyle survey: A 21-year prospective cohort study. *Psychosomatic Medicine*, 2007; 69 (9): 923-931.
- Shrivastaval P, Gopal R, Singh Y. A Study of Personality Dimensions in Sports Performance. *Journal of Exercise Science and Physiotherapy*, 2010; 1: 39-42.
- Soto CJ, John OP, Gosling SD, et al. The developmental psychometrics of Big Five self-reports: acquiescence, factor structure, coherence, and differentiation from ages 10 to 20. *Journal of Personality and Social Psychology*, 2008; 94: 718-737.
- Terracciano A, Schrack JA, Sutlin AR, et al. Personality, metabolic rate and aerobic capacity. *Plos One*, 2013; 8 (1): 547-556.
- Tok S. The Big Five personality traits and risky sport participation. *Social Behaviour and Personalistly an International Journal*, 2011; 39: 1105-1012.

- Tolea MI, Terracciano A, Simonsick EM, et al. Associations between personality traits, physical activity level and muscle strength. *Journal of Research in Personality*, 2012; 46 (3): 264-270.
- Tomczak M, Bręczewski G, Sokołowski M, et al. Personality traits and stress coping styles in the Polish National Cadet Wrestling Team. *Archives of Budo*, 2013; 2: 161–168.
- Wiggins J. *The Five-Factor model of personality*. New York: The Guildford Press; 1996.
- Williams PT. Lower prevalence of hypertension, hypercholesterolemia, and diabetes in marathoners. *Medicine & Science in Sports & Exercise*, 2009; 41(3): 523-529.
- Zdebski J, Blecharz J. Looking for an optimum model of athlete's support. *Biology of Sport*, 2004; 21 (2): 129-137.