

# CONNECTIVITY OF ATHLETES' PERSONALITY TRAITS AND CAREER PERIOD AS THEIR PREDICTOR

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## Abstract

*Not only cognitive processes and training, but also personality traits are important for successful practicing of sport. 69 athletes were studied in Bulgaria by means of some computerized test methods from Vienna Test system (4DPI concerning their compatibility for team work, RISIKO concerning their readiness for risk-taking, AHA concerning their frustration tolerance and aspiration level) and three questionnaires concerning their aggression, neuroticism, and communicative self-control. The results indicated that some personality traits were interrelated. A group of relationships between the personality traits included neuroticism, communicative self-control, and physical aggression. Another group of relationships between the studied personality variables included compatibility for team work and readiness for risk-taking. Indirect aggression was a linking variable between aspiration level on the one hand, communicative self-control and physical aggression on the other hand, and also with readiness for risk taking. Frustration tolerance was not related to the other studied personality traits in the athletes. The period of sports experience, and age both predicted athletes' compatibility. The period of sports experience also predicted athletes' readiness for risk taking and indirect aggression. The importance of these findings for reducing traumatic experiences in athletes was discussed.*

**Key words:** aggression, compatibility, neuroticism, readiness for risk-taking, self-control.

## Introduction

Mental preparedness of athletes assists the realization of their physical preparedness. Athlete's success can be predicted by personality traits (Allen & Laborde, 2014). Psychological studies play an important role for assessment and development of mental states related to different stages of physical preparedness. Informing the sportsmen and the coaches about the results from psychological studies could enhance athletes' self-knowledge and it could indicate some strengths and weaknesses that should be further developed or overcome. Sport is a factor for self-monitoring and self-knowledge (Dimitrova, 1995). Some personality traits and states seem to be related to sports performance, for example self-control and aspiration level may be important for achievements in all kinds of sports. It was established that during a continuous performance task skilled athletes controlled their attention and motor responses (Sanchez-Lopez, Fernandez, Silva-Pereyra, Martinez Mesa & Di Russo, 2014), so self-control is important for successful practicing of sport. Succeeding sportsmen use more self-controlling self-talk (Hardy, Oliver & Tod, 2009, p.42) that is why communicative self-control seems to be related to successful performance in sport. The results from different studies have revealed that sportsmen have more self-control (Coetsee, 2009; Velichovska, Naumovski, Strezovski, Markovski & Meshkovska, 2012), self-control seems typical for them.

Athletes are more self-controlling and realistic than non-athletes partly due to sportsmen's participation in competitions and achievements (Kanniyan, George & Valiyakath, 2015). Being realistic is related to self-setting attainable goals. Realistic, achievable goals should lead to effective performance

(in Kingston & Wilson, 2009, p.103). Failure or a lack of progress in current performance together with high aspirations could worsen further performance (in Kingston & Wilson, 2009, p.82). High initial aspirations exceeding individual performance capacity after some efforts and persistence could be adjusted to more realistic goals (in Kingston & Wilson, 2009, pp.79-80).

Risk-taking is related to aspiration level and could play an important role for performance in different sports. Risk-taking in sport may be inspired by increased physiological arousal of win or loss, and striving to achieve an important objective (Makarowski, 2008). Sportsmen with high levels of conscientiousness take fewer reckless risks before and during athletic competitions (in Allen & Laborde, 2014). Some studies specify differences in personality traits depending on the sports position and the type of the practiced sport – it has been found that risk-taking characterizes sportsmen practicing swimming (Stoyanova & Georgieva, 2006) and some sports positions like bowlers are related to greater risk-taking than other playing positions like wicketkeepers (Coetzee, 2009).

Interceptive sports that dominantly require coordination between the whole body, its parts and an object in the environment - e.g. tennis, fencing, boxing, etc. (Voss, Kramer, Basak, Prakash & Roberts, 2010) suppose higher readiness for risk-taking - for example in boxing (Lefterov, Dimitrov & Georgiev, 2014) and low neuroticism.

Successful athletes have lower levels of neuroticism and anxiety (in Allen & Laborde, 2014). Athletes' anxiety is related to worse performance (Knapová, 2016), partly because neuroticism correlates with anxiety and depression in athletes (Petito et al., 2016). Higher levels of neuroticism and anxiety predicted performance in both fine motor anaerobic sports (alpine skiing, basketball, tennis, and the sprint running and field events) and gross motor, aerobic sports (cross country running, nordic skiing, and track running events over 400 meters) (Taylor, 1987). Neuroticism diminishes athletes' organizational citizenship behaviour related to the effective and efficient functioning of the team (Mosalaei, Nikbakhsh & Tojari, 2014).

According to some authors, both athletes in individual and team sports are characterized mainly with emotional stability (Dhesi & Bal, 2012, p.10), but other studies indicate that athletes in team sports are more neurotic than athletes who participate in individual sports and who tend to be more emotionally stable (Dobersek & Bartling, 2008). Some studies of concrete individual sports do not consider emotional stability as a personality trait characterizing the athletes practicing such sports – for example in tennis (Lopez & Santelices, 2011). Other studies consider emotional stability as characterizing all sportsmen, resulting from sports practice that facilitates development of emotional stability (in Mackreth, van Wely, Ireland, Carnell & Powell, 2010, p.202; Velichovska, Naumovski, Strezovski, Markovski & Meshkovska, 2012).

Neuroticism is related to aggression in sportsmen (Brinkman, 2013) and vice versa - aggressiveness is a predictor of anxiety (Velikić, Knežević & Rodić, 2014). Athletes are more aggressive than non-athletes (Kannian, George & Valiyakath, 2015). Aggression is accompanied with anger and immoderation that are negatively related to compatibility, and cooperation is positively related to compatibility as a dimension of coachability expressed as working with teammates, trust and respect for coaches (Favor, 2010). Athletes are characterized by willingness for cooperation (Velichovska, Naumovski, Strezovski, Markovski & Meshkovska, 2012). Sportsmen with high levels of agreeableness and conscientiousness get on well with their teammates and coaches (in Allen & Laborde, 2014). Athletes' compatibility, emotional stability and self-control probably oppose their aggressiveness.

Static sports involve consistent, self-paced situations - e.g. long distance running, swimming, etc. (Voss, Kramer, Basak, Prakash & Roberts, 2010). They require high self-control and frustration tolerance.

Strategic sports involve simultaneously processing a substantial amount of information regarding teammates, opponents, field position and ball in varied situations - e.g. volleyball, basketball, soccer, etc. (Voss, Kramer, Basak, Prakash & Roberts, 2010). They could be related to such personality traits as aggression, neuroticism, compatibility for team work, frustration tolerance, and readiness for risk-taking.

Different studies have described a lot of personality traits in sportsmen. Any gender differences have not been found in athletes' personality variables (Lopez & Santelices, 2011). This study aimed to verify the interconnections between some personality traits, not searching for any gender differences in them.

It is not possible to be studied all aspects related to the manifestation of one personality trait, neither all personality traits in athletes. The aim of this study was to be differentiated the interactions between some personality traits in athletes – such as aggression, neuroticism, compatibility for team work, frustration tolerance, aspiration level, readiness for risk-taking, and communicative self-control in relation to the period of sports experience and training. The enumerated personality traits were chosen because they could influence on athletes' performance and they have been reported as typical for sportsmen in some of the studies presented in the literature review.

One hypothesis of the study was that some personality traits would be related to other personality

traits in sportsmen – for example communicative self-control and neuroticism would be related. Higher emotional stability could be maintained by means of higher self-control.

Another hypothesis of the study was that sportsmen would have high level of communication skills for self-control, emotional stability, and team-work, but medium levels of aggression. It has already been found that athletes typically are self-controlling (Coetzee, 2009; Hardy, Oliver & Tod, 2009; Kannian, George & Valiyakath, 2015; Velichovska, Naumovski, Strezovski, Markovski & Meshkovska, 2012), and emotionally stable (Allen & Laborde, 2014; Dhesi & Bal, 2012; Mackreth, van Wely, Ireland, Carnell & Powell, 2010, p.202; Velichovska, Naumovski, Strezovski, Markovski & Meshkovska, 2012) – findings that suppose lower manifested aggression. Athletes' capabilities of team-work seem obvious, because of the nature of team sports.

A third hypothesis was that the period of sports experience and age would be related to some personality traits like compatibility, because the skills for team work could increase with age and longer period of sports experience. It has already been found that emotional stability is related to more time of sports practice and less withdrawal, whilst agreeableness – to less time of sports practice (Costa & Oliva, 2003). Longer sports experience may be related to more sports achievements.

## Methodology of Research

Several psychological studies were conducted from 2012 to 2015 among the athletes from the different sports clubs in Blagoevgrad and Sofia, Bulgaria.

These studies were a part of the project “Models for psycho-functional studies in sport” approved by the project committee of South-West University “Neofit Rilski” and funded by Bulgarian Ministry of Education and Science on Decree 9 / SRP-B12/12.

All subjects participated voluntarily and agreed to be studied. The results are presented anonymously.

### *Participants*

The participants in the study were 69 athletes in total. Table 1 presents a description of the sample.

**Table 1. Number of the studied sportsmen in different social categories.**

Social category	Subgroup	N
Gender	Male	43
	Female	26
Level of sports mastership	Elite (national) athletes	12
	Regional athletes in sports clubs	57
Type of sport	Aerobics and fitness	8
	Badminton	1
	Biathlon	5
	Combat sports (judo, sambo, Muai Thai, and taekwondo)	19
	Dancing	1
	Football	10
	Handball	7
	Snowboard	1
	Swimming	2
	Tennis	7
	Track and field athletics	6
	Volleyball	2

They practiced sport from 3 to 20 years ( $M=10$  years;  $SD=3.8$  years). Their mean age was 25.3 years old ( $SD=9.6$ ).

**44 Instruments**

Three computerized test methods from Vienna test system and three paper-pencil (questionnaire) methods were used. Each computerized method had a training phase and a testing phase. The computerized test methods were:

- 4DPI - Scale (In) compatibility

The respondent answered regarding several traits (pretentious, miserly, spiteful, scheming, deceitful, avaricious, cynical, negative, nasty, envious, opinionated, egocentric, obstinate, egoistic) by moving a marker to the right (applies more) and to the left (applies less) of a line.

The high score means incompatibility, lack of co-operation. The low score means compatibility, and shows team spirit (Menghin, Kubinger & Prieler, 2003).

- RISIKO

A green ball moved about the screen, undergoing unpredictable changes in direction. The respondent was instructed to use the control lever on the response panel to keep the ball "trapped" inside a circle. The maximum obtainable score depends on the radius of the circle that is selected by the respondent before each run. The test is made up of several test phases, with each phase consisting of several runs. The estimated variable was Readiness to take risks – the higher the score, the more ready the individual is to take risks (Guttmann, Bauer & Herle, 2005).

- AHA

Its subtest "Coding symbols" assessed frustration tolerance (if the subject was influenced by repeated negative feedback), and the aspiration level (whether the subject had a tendency towards realistic or unrealistic objectives – average results mean realistic objectives, low and high results mean setting unrealistic objectives). The subject corresponded four different figures following an indicated model and after each minute of work s/he was informed on the screen that the previous participants performed better and s/he was required to make a prognosis regarding his/her next performance (Kubinger, Ebenhö, Karner & Sommer, 2003).

The Bulgarian versions of three paper-pencil questionnaires were used:

The short form of Snyder's self-monitoring scale (Angelova & Krastev, 1997; Snyder, 1980) assessed the degree of self-control in communication by answering "yes" or "no" to 10 items. Higher score indicates more self-monitoring and communicative self-control in order to be manipulated the other people's impressions of oneself.

Physical aggression and Indirect aggression scales from Buss-Durkee Hostility Inventory were used (Angelova & Krastev, 1997; Buss & Durkee, 1957). High scores on the scales indicated Physical aggression and Indirect aggression, respectively. Physical aggression includes participation in clashes, and Indirect aggression indicates the tendency to break the belongings of the target of aggression.

The scale Neuroticism from Eysenck Personality Questionnaire measuring emotional stability/instability was used (Angelova & Krastev, 1997; Paspalanov, Shtetinski & Eysenck, 1984). High scores on the scale indicated high neuroticism, emotional instability.

### *Data Processing*

Data were statistically processed by means of SPSS 16. Descriptive statistics (percentage distribution) were reported for the studied variables. Correlation analysis (Pearson correlation coefficient) was applied to establish connectivity between the studied personality traits. Linear regression analysis was applied to establish dependency of the studied personality traits on the athletes' age and the period of sports experience. Data were visualized in Figure 1 by means of Agna software.

## Results of Research

The most of the studied sportsmen had medium level of the studied personality characteristics except for physical aggression and indirect aggression that were expressed mainly in their low levels (see Table 2).

**Table 2. Percentage of the levels of some personality traits in athletes.**

Variable	Low level	Medium level	High level
Frustration tolerance	21.9	40.7	37.4
Indirect aggression	43.8	18.8	37.4
Physical aggression	40.6	28.1	31.3
Communicative self-control	15.6	56.2	28.2
Neuroticism	28.1	50	21.9
Readiness for risk-taking	32.3	55.2	12.5
Aspiration level	28.1	59.5	12.4
Compatibility	12.4	78.2	9.4

The low levels of neuroticism, readiness for risk-taking, compatibility, physical aggression, and indirect aggression were more frequent than their high levels. The high levels of frustration tolerance and communicative self-control were more frequent than their low levels. More than a half of the studied athletes set realistic goals for themselves.

Only the significant Pearson correlations between some personally traits in sportsmen are presented in the Results section.

Higher physical aggression ( $r_{(30)} = 0.453$ ;  $p < .001$ ), higher communicative self-control ( $r_{(30)} = 0.473$ ;  $p = .006$ ), and higher aspiration level, i.e. setting more unrealistic goals ( $r_{(30)} = 0.396$ ;  $p = .025$ ) were related to higher indirect aggression. Higher readiness for risk taking was related to lower indirect aggression ( $r_{(29)} = -0.371$ ;  $p = .04$ ).

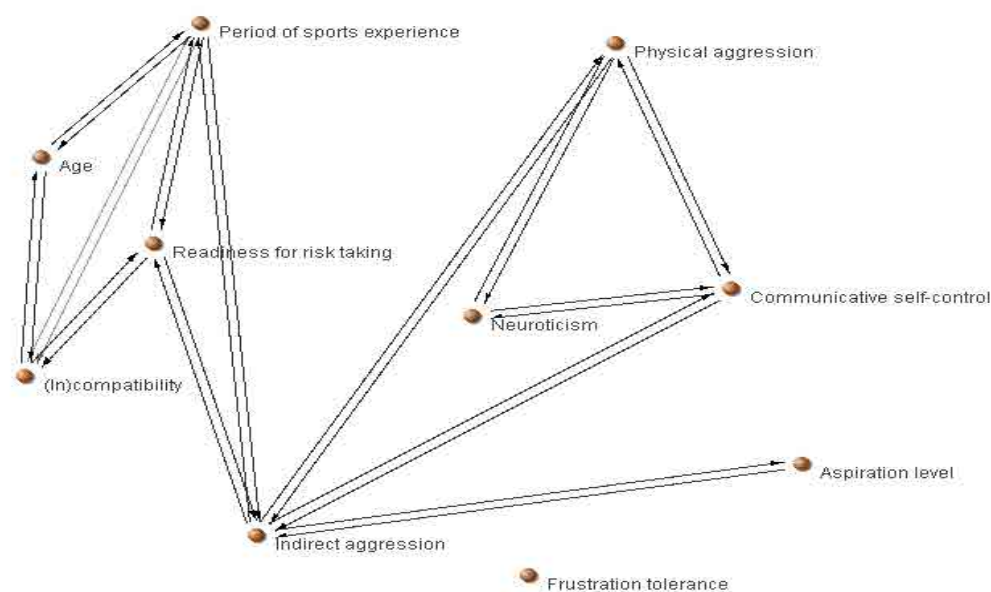
Higher neuroticism was related to higher sportsmen's physical aggression ( $r_{(30)} = 0.461$ ;  $p = .008$ ) and higher communicative self-control ( $r_{(30)} = 0.534$ ;  $p = .002$ ).

Higher physical aggression ( $r_{(30)} = 0.356$ ;  $p = .045$ ) was related to higher sportsmen's communicative self-control.

Higher readiness for risk-taking was related to higher athletes' incompatibility ( $r_{(54)} = 0.527$ ;  $p < .001$ ) – better working alone than in team. Athletes' age did not predict any of the studied personality variables ( $p > .05$ ) except for athletes' compatibility. Advance in age was related to slightly increased sportsmen's incompatibility ( $r = 0.323$ ;  $r^2 = .104$ ;  $F_{(1,57)} = 6.617$ ;  $p = .013$ ;  $t = 2.572$ ;  $p = .013$ ;  $b = 0.334$ ). Longer period of sports experience was related to diminished sportsmen's incompatibility and increased sportsmen's compatibility ( $r = .597$ ;  $r^2 = .356$ ;  $F_{(1,52)} = 28.77$ ;  $p < .001$ ;  $t = -5.364$ ;  $p < .001$ ;  $b = -0.885$ ) – they acquired more skills for team work with longer sports practice. Longer period of sports experience was also related to diminished athletes' readiness for risk taking ( $r = .328$ ;  $r^2 = .107$ ;  $F_{(1,52)} = 6.253$ ;  $p = .016$ ;  $t = -2.501$ ;  $p = .016$ ;  $b = -1.346$ ). Longer period of sports experience was also related to diminished athletes' indirect aggression ( $r = .379$ ;  $r^2 = .143$ ;  $F_{(1,29)} = 4.854$ ;  $p = .036$ ;  $t = -2.203$ ;  $p = .036$ ;  $b = -1.932$ ).

Longer period of sports experience meant more advance in sportsmen's age ( $r_{(87)} = 0.846$ ;  $p < .001$ ). Advance in age was related to longer period of sports experience.





**Figure 1: Model of interactions between some personality traits in sportsmen, the period of sports experience and age.**

Figure 1 presents a model of the interactions between the studied personality traits in the athletes. Frustration tolerance did not correlate significantly to any of the studied personality traits in sportsmen ( $p > .05$ ).

## Discussion

The first and the third hypotheses of the study were confirmed, whilst the second hypothesis was supported partly. Some personality traits were related to other personality traits in sportsmen. The personality traits such as neuroticism, communicative self-control, and physical aggression were interrelated. Some other studies have also established the relationship between neuroticism and aggression in sportsmen (Brinkman, 2013) and in other social categories (Zografova, 2001). This relationship between neuroticism and aggression in sportsmen could be moderated by some other psychological variables such as the use of different defense mechanisms (Ivantchev & Yordanov, 2014). This study indicated a direct connection between neuroticism and aggression.

Indirect aggression was related to the most of the studied personality variables - physical aggression, communicative self-control, aspiration level and readiness for risk taking. Compatibility for team work and readiness for risk-taking were also interconnected. Personality traits are related in a system indicated by many relationships between them. Only frustration tolerance was not connected to the other studied personality traits in the athletes. A sample bigger in number could reveal more relations between sportsmen's personality traits.

The period of sports experience predicted compatibility, as well as age did, but the relationships between the period of sports experience and age with compatibility were the opposite – longer period of sports experience developed compatibility, advance in age diminished compatibility that illustrates the importance of the period of sports career and sports training for developing compatibility.

Longer period of sports experience was also related to diminished athletes' readiness for risk taking that could be related to improvement of compatibility because of the shared responsibility for the results of the team, so diminished indirect aggression could be related to higher team cohesion developed with the longer period of the sports practice. Sports practice developed some skills for team-work – in 87.6% of the studied sportsmen. This is valid especially for team sports, but individual sports do not exclude team-work, because of their training phase or because of the practice in relay-race and in couple competitions. Medium, not high level of compatibility for team work prevailed among the studied sportsmen, as well as mainly high and medium levels of communication skills for self-control, and emotional stability; medium and low levels of physical and indirect aggression.

Motor expertise enhances flexibility and better cognitive control to the requested task (Sanchez-Lopez et al., 2014). Prevalence of medium and high level of communicative self-control among sportsmen could be related to their good motor expertise.

Sport develops emotional stability and low anxiety – only 1/5 of the studied sportsmen were emotionally unstable. Composure and self-control are advantages for sportsmen, because Grossbard, Smith, Smoll & Cumming (2009) found that worry and concentration disruption were related to poor performance in competitive sport situations.

Sport is not related obligatory to high aggressive behaviour. About 1/3 of the studied sportsmen had a high degree of aggression, because of the inevitable physical contacts between the sportsmen.

These results concerning sportsmen's aggression and neuroticism revealed the role of all kinds of sports for mental relaxation and catharsis of negative feelings and attitudes. Risk-taking could increase anxiety and experiencing other negative emotions. As Uphill, McCarthy & Jones (2009, p.172) state seeking risk is related to diminished levels of fear, but higher emotional excitement. Prevalence of low and medium levels of readiness for risk-taking among the studied athletes could be related to their medium and high level of communicative self-control, setting more realistic goals (a small number of sportsmen had high aspiration levels), and taking responsibility for the results in team sports. About 60% of sportsmen seemed to be aiming at achievement of realistic goals. Thomas, Mellalieu & Hanton (2009, p.142) found that unrealistic goals may create anxiety for the performer. Mental toughness is important for athletes' successful performance. The personality traits characterizing mentally tough sportsmen are: being self-motivated and self-directed, highly energetic and ready for action, determined; positive but realistic; self-controlling, in control of emotions, calm and relaxed under tension; mentally alert and focused; self-confident, responsible, self-disciplined, compatible for team work (Connaughton & Hanton, 2009, pp.322, 324). The results from this study revealed at least 1/3 of the studied sportsmen as mental tough – at the same time possessing good self-control, being emotionally stable, realistic (setting realistic goals for themselves), and compatible for team work.

Fitness and computer-based cognitive training are a means to enhance cognition and brain function (Voss et al., 2010). Computerized testing could have the effect of computer-based cognitive training because of its training phase preceding the testing phase. Each studied athlete was interested in his/her own results and s/he was informed about them that could enhance self-understanding and assist in developing some personal qualities. Personal typology of athletes, their age peculiarities, and their level of preparedness influence the results from the studies. The low level of the athlete's mental preparedness is related to level down in his/her functional and motor indicators. Grounding on the results from psychological studies, the coach could estimate his/her tactical decisions in the process of competition or before it. It is important to be studied the sportsmen's personality traits. For example, it has been established that Aggressiveness as a personality trait should be considered in order to reduce the incidence of injuries in athletes (Keller, Braga & Coelho, 2013). The findings from this study reveal that increasing emotional stability and diminishing communicative self-control (acting in a different way from one's real wishes to be manipulated the impressions created in other people) could decrease the levels of aggression. The forms of aggression are interrelated and diminishing one of them could also decrease the others. All these findings could indirectly contribute to reducing traumatic events in athletes.

## Conclusion

This research points out the connectivity between athletes' personality traits and the importance of sports experiences, training and practice for development of some personality traits. Further studies should include more participating athletes, and they could compare personality qualities among athletes in different types of sports. For example, one could expect more physical aggression among athletes in combat sports than in individual sports. The period of sports experience could predict more strongly personal traits in some types of sports than in others that is why it is important equal and representative number of sportsmen to be compared for every type of sport. It has been established that the period of sports experience predicted athletes' compatibility, and one can suppose that such relationship between these variables could be more strongly expressed in team sports than in individual sports. Longitudinal studies of personality traits could reveal in more details their development and their dependence on the period of sports practice.

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