PREDICTION OF STATE ANXIETY IN ATHLETES BASED ON PERSONALITY TRAITS

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Abstract
The goal of this research was to test whether and to what extent personality traits contribute to the explanation of state anxiety in athletes. This study relied on a multidimensional construct of anxiety which includes somatic and cognitive anxiety and sport self-confidence. Dimensions of anxiety were measured with „Competitive State Anxiety Inventory-2"- CSAI-2, and HEXACO basic personality traits were measured with the instrument HEXACO-60. The research sample consisted of 117 athletes, who were engaged in various competitive sports. Results showed the statistically significant correlations between honesty, emotionality, extraversion, and conscientiousness as personality traits on the one hand and cognitive anxiety, somatic anxiety and self-confidence on the other. Whereas correlations between agreeableness and openness to experience on the one hand and cognitive anxiety, somatic anxiety and self-confidence on the other are not statistically significant. Multiple regression analysis were conducted with the aim of predicting the dimensions of anxiety based on personality traits in athletes. Based on personality traits 37% of variability in cognitive anxiety, 30% of somatic anxiety, and 36% of variability in self-confidence were explained. This study provided a better understanding of the personality traits of athletes that contribute to state of anxiety, coping with challenges and reacting in competitive situations.

Key words: PERSONALITY TRAITS / ANXIETY STATE / ATHLETES

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INTRODUCTION

Personality traits

Personality is an all-encompassing whole, it is the integration of an individual's traits into a relatively stable and unique organization which determines that individual's activity in a changing environment, and which is shaped and changed under the impact of that activity (Petz, 2005). There are many theories which, in different ways, explain the structure and development of personality, but there is a consensus that personality significantly impacts human behavior.

In the course of the last two decades of the twentieth century, the Big Five model developed into a dominant theoretical and research paradigm when it comes to the structure of basic personality traits (Costa & McCrae, 2008; Goldberg, 1990; John, Naumann, & Soto, 2008). According to this model, personality is made up of five basic, mutually orthogonal traits: neuroticism, extraversion, openness, agreeableness, and conscientiousness. These five traits proved themselves to be successful predictors of different kinds of behavior (Soto & Jackson, 2013). However, the studies conducted in the late 1990s indicated that it is necessary to test the six-factor structure of latent dimensions. Probably the best-known operationalization of a thus revised lexical model of personality is the HEXACO structure (Ashton, Lee, & De Vries, 2014; Lee & Ashton, 2012; Lee & Ashton, 2008), whose name is an acronym for the dimensions that are represented in it: H-Honesty/Humility, E-Emotionality, X-eXtraversion, A-Agreeableness, C-Conscientiousness and O-Openness. Honesty is characterized by such traits as sincerity, modesty, and greed avoidance as opposed to arrogance and greed. Persons who are high in this dimension are not likely to cheat and manipulate, and they are not motivated by material gains or social status. As opposed to that, persons who are low in the dimension of honesty are likely to break rules, they are motivated by material gains, and they have a strong sense of self-confidence. The description of the emotionality dimension consists of the following traits: timidity, discomfort, dependence on others, and sentimentality as opposed to fearlessness, independence, and unemotionality. Highly emotional persons are more likely to experience fear and discomfort, so they need to have close relationships and receive emotional support. On the other hand, persons who are low in emotionality have neither worries nor fears, even in stressful or dangerous situations, and they do not share their emotions with others. Traits of the extraversion dimension are sociability, liveliness, social boldness, and self-respect as opposed to shyness and passivity. Persons who are high in extraversion feel positive about themselves, they enjoy being in company and interacting with people, and so they experience positive feelings of enthusiasm and energy. As opposed to them, persons who are at the opposite extreme of this dimension feel uncomfortable in social situations, they are shier and more passive in their relationships with others, they are indifferent to social activities and feel less optimism. The following traits are related to the agreeableness dimension: patience, gentleness, flexibility, and forgivingness. A kind nature and tolerance are specific to individuals who are high in agreeableness, and so is readiness to compromise and cooperate with others, as well as readiness to control one's temperament. At the opposite extreme of this dimension, the following traits are characteristic: an impulsive temperament, irritability, a critical attitude, and an inclination for discussion. The traits that define conscientiousness are industriousness, good organization, prudence, and perfectionism as opposed to disorderliness, negligence, irresponsibility, and laziness. Dedication to work, striving for perfection, and cautiousness when making decisions are traits of the persons who are high in conscientiousness. On the other hand, persons who are low in the conscientiousness dimension avoid difficult and demanding tasks, and they make their decisions impulsively or with little forethought. The dimension of openness to experience consists of curiosity, aesthetic appreciation, creativity, and unconventionality as opposed to unimaginativeness and conventionality. To persons who are high in openness to experience, the following traits are specific: creativity, imagination, originality, intellectual curiosity, and interest in unusual people and ideas. Persons who are low in this dimension are not intellectually curious, so they are not attracted by unconventional ideas.

The study of personality traits has an important place in the field of sport psychology (Naveira Garcia, Ruiz, & Pujals, 2011). The study of personal traits in athletes is significant, and so is the study of their impacts

on other psychological characteristics which are crucial factors of success and achievement. Personality traits in athletes differ from the traits of the people who do not partake in competitive sports. So, compared to those who are not athletes, athletes are characterized by higher extraversion and lower neuroticism (Mckelvie, Lemieux, & Stout, 2003; Wilson, Krueger, & Gu, 2005; DeMoor, Beem, & Stubbe, 2006); by greater emotional stability (Naveira Garcia et al., 2011; Rhodes, Courneya, & Jones, 2005; Wilson et al., 2005). An overview of research results indicates that personality is relevant to sport success (Rees et al., 2016; Allen, Greenlees, & Jones, 2011). In most pieces of research which studied the personality of athletes, their traits were operationalized by means of five-factor models of personality (DeMoor et al., 2006). Given the small number of existing studies and an ever-growing popularity of the six-factor solution for basic personality traits, this study relied on the HEXACO model of personality.

Anxiety

Numerous studies have indicated the importance of psychological factors for success of athletes (Aidman, 2007; Tsopani, Dallas, & Scordilis, 2011). Anxiety is defined as fear, worry, tension, disharmony, and discomfort. In sports, anxiety is associated with the situations of skill performance and it is manifested as a result of the conflict between, on the one hand, desire, striving and the need to achieve a goal, and on the other hand, worry, fear and discomfort that the goal in question cannot be achieved, and the consequences that one's failure to achieve that goal carries with it (Lazarević, 2003). Anxiety as an emotion may appear as a structural personality trait and also as a transitory state associated with a particular sport situation. Anxiety as a personality trait is a structured, relatively permanent and stable, disposition, a tendency to perceive numerous situations as threatening or jeopardizing although, in objective terms, they are not and do not have to be such. Persons with this trait manifest certain reactions which often do not match the intensity of a real threat. This trait, in great measure, sets successful athletes apart from those who are less successful, even though they both have similar physical and technical abilities (Zadkhosh, Zandi, & Hemayattalab, 2018). State anxiety refers to an emotional state which is characterized as a conscious feeling of tension, excitement, worry, and fear. State anxiety changes from one situation to another, from the moments of preparation for a match (slight worriedness), to the moments just before the match (tension, nervousness, elevated heart rate), to the relaxation of tension when the match starts and then also to new changes of state in individual and sudden situations during the match (when a teammate gets injured or when the result is almost tied). Athletes who have a relatively permanent, structured trait anxiety are more strongly predisposed to manifest these types of behavior in stressful situations.

Martens et al. (1990) point out that sport anxiety is a multi-dimensional construct. According to multi-dimensional theory of anxiety, anxiety includes a somatic component, a cognitive component, and self-confidence. It is important to mention that these components are manifested in state anxiety. The said components differ from one another in terms of antecedents and the ways of manifestation. Somatic state anxiety refers to the indicators of autonomous excitement as manifested in the form of elevated heart rate, sweaty hands, discomfort in the stomach, tension and pain in the muscles, rapid breathing, etc. In subjective terms, a athlete experiences this as apprehension, tension, or as tiredness, apathy, and lethargy. These symptoms are usually present in a athlete before and less often during a competition. Cognitive anxiety signifies anxious thoughts, incessant anticipation of unfavorable outcomes of events, too much worry about possible negative consequences, cognitive preoccupation with oneself and with the events that are beyond one's reach and control. Quite often, authors recognize cognitive anxiety as the key dimension of sport anxiety (Bridges & Knight, 2005; Dunn & Dunn, 2001). Cognitive anxiety is most frequently oriented toward the future, and it appears when attention is directed at the expected sources of threat, that is to say, at the possibility of failing (Bridges & Knight, 2005; Dunn & Dunn, 2001; Humara, 1999). When a athlete is in fear of failure and expects it, they are focused on what they cannot do, on their weak points, instead of being focused on their potentials and on what they can do. Therefore, in key and decisive situations for a competition, that athlete is unable to stay calm and focused on

what they can control and on what is important. Lack of sports self-confidence, although not a direct measure of anxiety, results in a higher degree of cognitive anxiety.

Personality traits exert a significant impact on sport anxiety (Dacanay, 2016). Studies using a sample of athletes have established a connection between anxiety and neuroticism (Petito et al., 2016; Patsiaouras Chatzidimitriou, Charitonidis, Giota, & Kokaridas, 2017) and extraversion (Dal, 2018; Amiri, Amiri, Abbasalipour, & Amiri, 2017; Matsumoto, Takeuchi, Nakajima, & Iida, 2000). Conscientiousness has been a predictor of sport anxiety (Matsumoto et al., 2000). In other words, athletes who are high in conscientiousness are more persistent when it comes to training, and therefore have more self-confidence and are less anxious.

The overview of the studies given above points to the significance of personality traits and anxiety for success and mental preparedness for competition in athletes. The goal of this study was to examine whether and to what extent personality traits are predictors of anxiety in athletes. The assumptions of this study were defined based on the results of previous studies. In other words, the following results were expected: positive relations between emotionality on the one hand and state of cognitive and somatic anxiety on the other; a negative relationship between conscientiousness, extraversion and honesty, on the one hand, and state of cognitive anxiety and somatic anxiety on the other; a negative correlation between emotionality and self-confidence; and a positive relation between conscientiousness, extraversion and honesty, on the one hand, and self-confidence on the other.

METHOD

Sample

The research sample consisted of 117 athletes, 67 men and 50 women. The structure of the sample by age was: 64 athletes are from 20 to 25 years old; 19 respondents aged 25-30; 31 athletes aged 30 to 35; and 4 respondents are over 35 years old. The sample consisted of 54 athletes of individual sports (archery, different types of martial arts, tennis) and 64 athletes of collective sports (basketball, football, volleyball). Athletes train for a different number of years (M= 13.31, SD = 6.48).

Research procedure

The research was conducted from February to the end of April of 2021. Athletes from Belgrade, Pirot, Niš and Novi Sad were examined. The respondents were informed about the purpose of research, anonymity and the manner of data usage. It took them 15 minutes on average to fill out the questionnaire. Statistical data processing was conducted by means of the program IBM SPSS Statistics 21. Within data processing, Pearson's correlation coefficient and multiple regression analysis were used.

Instruments

HEXACO basic personality traits were measured with the instrument HEXACO-60 (Ashton, Lee, 2009). This instrument, which represents an operationalization of the HEXACO model of personality structure, measures six broad domains of personality: Honesty/Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, Openness. In total, the questionnaire contains 60 items which measure those 6 domains (10 for each factor). Respondents express how much they agree or disagree with each of the 60 statements on a scale of 1 to 5 (from 'I totally disagree' to 'I totally agree'). Examples of items of measured dimensions are: for the dimension of honesty "I would never accept a bribe, not even if it were a very large one", for emotionality "Sometimes I cannot help worrying about trifles", for the dimension of extraversion "I prefer jobs which involve contact with people to ones where I must work alone", for the agreeableness "Mostly, I do not get angry with people, not even with those who have hurt me a lot", for the dimension of conscientiousness "I plan in advance and organize myself in order to avoid having to finish something at the last moment" and for openness "I like people with unconventional attitudes". The reliability (Cronbach's alpha coefficient) of the

scales of this instrument were high (Honesty α=0.81; Emotionality α=0.81; Extraversion α=0.84; Agreeableness α=0.66; Conscientiousness α=0.85; Openness α=0.79).

Anxiety was measured with Competitive State Anxiety Inventory-2" (CSAI-2) (Martens et al., 1990). This questionnaire is made up of 27 statements with an offered Likert-type four-degree scale for saying how much you agree or disagree with a given statement. The offered degrees of agreement or disagreement range from 1- I totally disagree, ..., to 4 – I totally agree. The questionnaire consists of three subscales: cognitive anxiety as referring to the expectation of a negative outcome, failure; somatic anxiety as referring to bodily reactions just before a competition, and sport self-confidence as referring to belief in oneself and one's own abilities. Each of the subscales has 9 questions. Examples of items of measured dimensions are: for the dimension cognitive anxiety "I am worried because I am afraid that I will not be able to concentrate"; for somatic anxiety "I feel my heart beating" and for sports self-confidence "I know for sure that I can cope with the challenge of participating in the competition". The reliability (Cronbach's alpha coefficient) of the scale of this instrument were high (cognitive anxiety α=0.85; somatic anxiety α=0.87; sport self-confidence α=0.86).

The questionnaire also contained a part which pertained to demographic variables: gender (male, female), age, the sport that the respondent plays (individual or team sport), the number of years that he or she has spent training that sport.

RESULTS

The results in Table 1. showed the statistically significant correlations of medium intensity between honesty, emotionality, extraversion, and conscientiousness as personality traits, on the one hand, and cognitive anxiety, somatic anxiety and self-confidence on the other. Whereas correlations between agreeableness and openness to experience on the one hand and the dimensions and cognitive anxiety, somatic anxiety and self-confidence on the other were not statistically significant.

Table 1. Correlations between athletes' personality traits and cognitive and somatic anxiety and self-confidence

	Cognitive anxiety	Somatic anxiety	Self-confidence
Honesty/Humility	-,472[**]	-,419[**]	,367[**]
Emotionality	,517[**]	,445[**]	-,481[**]
Agreeableness	-,041	-,096	,048
Extraversion	-,540[**]	-,534[**]	,582[**]
Conscientiousness	-,449[**]	-,423[**]	,413[**]
Openness	-,129	-,167	,149

* p < 0.05; ** p < 0.01; *** p < 0.001.

The results of three multiple regression analyzes were presented below. Predictors of these analyzes were personality traits (honesty, emotionality, agreeableness, extraversion, conscientiousness, openness to experiences) and the criteria were cognitive anxiety, somatic anxiety and, finally, self-confidence.

Table 2. Prediction of athlete's cognitive anxiety on the basis of personality traits

	β	t	P
Honesty/Humility	-0.23	-20.05	0.04
Emotionality	0.26	20.42	0.02
Agreeableness	0.13	10.62	0.11
Extraversion	-0.25	-10.94	0.05
Conscientiousness	0.00	-0.01	0.99
Openness	0.04	0.46	0.65

Multiple regression analysis was used to examine whether personality traits were statistically significant predictors of cognitive anxiety (Table 2). The results showed that the predictors explain 37 variances of the

criterion variable ($R^2 = 0.37$, $F (6) = 10.98$, $p = 0.00$). An overview of partial standardized regression coefficients indicated that honesty ($\beta=-0.23$, $p<0.05$), emotionality ($\beta=0.26$, $p<0.05$) and extraversion ($\beta=-0.25$, $p<0.05$) had a statistically significant contribution to the explanation of individual differences in terms of level of cognitive anxiety. The partial contributions of other predictors were not statistically significant.

It was presented regression analysis (Table 3.) in which the criterion variable was somatic anxiety and predictors were personality traits of a athlete.

Table 3. Prediction of athlete's somatic anxiety on the basis of personality traits

	B	t	p
Honesty/Humility	-0.13	-10.16	0.25
Emotionality	0.12	10.06	0.29
Agreeableness	0.06	0.72	0.47
Extraversion	-0.37	-20.74	0.01
Conscientiousness	-0.01	-0.07	0.94
Openness	0.02	0.15	0.87

It was found that 30% of the variability ($R^2= 0.30$, $F (6) =80.20$; $p= 0.00$) of somatic anxiety can be explained on the basis of personality traits. The results showed that a statistically significant predictor of somatic anxiety was extraversion ($\beta = -0.37$, $p <0.05$). Other predictors were not statistically significant.

Table 4. presented the results of regression analysis and prediction of sport self-confidence as a dimension of anxiety based on athlete's personality traits.

Table 4. Prediction of athlete's sport self-confidence on the basis of personality traits

	β	T	p
Honesty/Humility	0.02	0.14	0.88
Emotionality	-0.15	-10.32	0.18
Agreeableness	-0.12	-10.39	0.16
Extraversion	0.51	30.87	0.00
Conscientiousness	-0.01	-0.06	0.94
Openness	-0.02	-0.16	0.86

The results showed that the predictors explain 36% of the variability of the criterion variable ($R^2 = 0.36$, $F (6) =10.43$; $p= 0.00$). Extraversion ($\beta = 0.51$, $p <0.05$) had a statistically significant partial contribution to the explanation of individual differences of self-confidence as a dimension of anxiety. Partial contributions of other predictors were not statistically significant.

DISCUSSION

Given the ever-stronger focus on success and achievements in sports, there is a large interest of researchers in establishing all the factors that contribute to this. The goal of this study was to examine whether and to what extent personality traits are predictors of anxiety in athletes. This study relied on a multidimensional construct of anxiety which includes somatic and cognitive anxiety and sport self-confidence. The findings showed that the level of sport anxiety depends on particular personality traits.

The study consisted of the results of three regression analyzes. Predictors of these analyzes were personality traits (honesty, emotionality, agreeableness, extraversion, conscientiousness, openness to experiences), and the criteria were cognitive anxiety, somatic anxiety and self-confidence. First, multiple regression analysis was conducted with the goal of predicting athletes' cognitive anxiety based on personality traits. Of the total variability in cognitive anxiety, 37% of the variability can be explained based on the personality traits of the athlete. Honesty, emotionality and extraversion had a statistically significant partial

contribution to the explanation of individual differences in the expression of cognitive anxiety. Partial contributions of other personality traits were not statistically significant. In the second regression analysis, the criterion variable was somatic anxiety and the predictors were athlete's personality traits. It was established that 30% of somatic anxiety variability can be explained based on personality traits. The results showed that the only statistically significant predictor of somatic anxiety was extraversion. Finally, a regression analysis was performed in which the criterion variable is self-confidence as a dimension of anxiety and the predictors were athlete's personality traits. It was established that 36% of self-confidence variability can be explained based on personality traits. The results showed that the only statistically significant predictor was extraversion.

The aspects of emotionality are anxiety and timidity, so that a positive correlation between this trait and a athlete's cognitive and somatic anxiety was expected and then also confirmed with results. A correlation was established between emotionality and sport self-confidence. Neuroticism (neuroticism from the Big Five model of personality is the counterpart of emotionality in the HEXACO model) is associated with the excitement of the limbic system and the imbalance of the autonomous nervous system (Eisenck, 1982), which leads to a higher level of anxiety and a lower level of self-confidence in stressful situations (Patsiaouras et al., 2017). Athletes who are higher in the emotionality dimension are more likely to experience fear and discomfort, they worry about making mistakes, they have higher cognitive and somatic anxiety and low self-confidence. Also, they do not believe in their abilities to achieve good sport results. On the other hand, athletes who are fearless are less likely to anticipate negative outcomes of events and they do not have somatic manifestations of anxiety. Less emotional athletes are more self-confident and believe more in themselves and in their technical and tactical preparedness for competitions. The results of other studies using the sample of athletes also confirmed the relation between anxiety and neuroticism (Petito et al., 2016, Patsiaouras et al., 2017).

In contrast to emotionality, negative correlations between extraversion on the one hand and cognitive and somatic anxiety on the other were confirmed. That is to say, extraversion is associated with positive affectivity and the aspects of extraversion refer to positive emotions, activity, striving for positive excitements, optimism, and sociability (Smederevac, Mitrović, & Čolović, 2010). More extraverted athletes, who are more enthusiastic and energetic, have a team spirit and are less likely to experience anxiety states in sports. On the other hand, more introverted athletes, who are more passive, more pessimistic and more withdrawn, develop anxiety states in sports on a more frequent basis. That is to say, the aspect of extraversion is social self-confidence which contributes to the development of sport self-confidence. The correlation of these variables has also been established in other studies on athlete samples (Dal, 2018; Amiri et al., 2017; Matsumoto et al., 2000). Authors (McCrae & Costa, 1991; Watson & Clark, 1992) point out that the link between anxiety on the one hand and extraversion and emotionality/neuroticism on the other is stronger than the link between anxiety on the one hand and conscientiousness, openness to experience and agreeableness on the other, which is in accordance with the results of this study.

The results showed statistically significant negative correlations between conscientiousness on the one hand and cognitive and somatic anxiety on the other. A positive correlation between conscientiousness and sports self-confidence was also established. Athletes who are higher in the conscientiousness dimension are less likely to be worried about potential negative consequences and they are less likely to manifest somatic manifestations of anxiety. Athletes who are high in conscientiousness are characterized by self-control, discipline, and investment of effort in the achievement of goals. It may be assumed that this kind of an athlete invests huge efforts and energy in training, which, as a result, has greater self-confidence about one's own abilities as well as lower anxiety. Whereas athletes who are lower in conscientiousness are more likely to have anxious thoughts and somatic symptoms of anxiety. These athletes are more irresponsible, conscienceless, lazy, and they do not invest continuous efforts in their development, so they do not believe in their competence and do not have high self-confidence, and they are more anxious. Matsumoto et al. (2000) established a correlation between conscientiousness, anxiety, and self-confidence in athletes who trained judo. The authors

explain that an athlete's conscientiousness shows his devotion to training and his investment in his abilities, which reflects on that athlete's self-confidence and anxiety.

The results showed statistically significant correlations between honesty on the one hand and cognitive and somatic anxiety and self-confidence on the other. Athletes who are higher in the honesty dimension are less frequently worried about possible negative outcomes and they are less likely to manifest somatic manifestations of anxiety. Athletes who are fairer believe more in their sport abilities. As opposed to that, athletes who are bound to break the rules, who are greedy and motivated solely by material gains, are also more anxious and do not have high sport self-confidence. The correlations between agreeableness and openness to experiences on the one hand and the dimensions of anxiety on the other were not statistically significant.

CONCLUSION

The goal of this study was to examine whether and to what extent personality traits are predictors of anxiety in athletes. The results showed statistically significant correlations between honesty, emotionality, extraversion, conscientiousness as a personality trait on the one hand and cognitive and somatic anxiety and self-confidence on the other. While the correlations between agreeableness and openness to experiences on the one hand and cognitive and somatic anxiety and self-confidence on the other were not statistically significant. The results of regression analyzes showed that 37% of the variability of cognitive anxiety, 30% of somatic anxiety and 36% of the variability of self-confidence were explained on the basis of personality traits. Results showed that extraversion was a predictor of all dimensions of anxiety, and emotionality and honesty were predictors of cognitive anxiety.

The essential drawback of this study, which one must bear in mind when interpreting the study results, is the number of respondents. The study sample was appropriate because it prevalently consisted of athletes who were attending sport studies or had graduated from a faculty of sports, that is to say, of athletes who were interested in improving their sport performances with the knowledge provided by science. Further limitations stem from the exclusive reliance on self-reporting questionnaires without alternative forms of evaluation or evaluation by third parties.

An analysis of the results of this study makes it possible to suggest the future directions of similar pieces of research. For instance, a future study should include a larger number of respondents and a comparison between respondents at different competition levels (regional, national and international). Each sport has its own specific stressors that precede the athlete's anxiety. Therefore, it would be important to create questionnaires on anxiety that refers to specific stressors that characterize a particular sport. Further research in this field is necessary to fully comprehend the way in which psychological factors affect the achievements of an athlete, or in other words, to help athletes eliminate the factors which obstruct a full realization of their potentials.

The obtained results are significant not only for researchers, for a better understanding of anxiety in a sport context, but also for those practically participating in sports, for coaches and athletes themselves. The study results indicate that personality traits are significant predictors of anxiety in athletes, which points to the fact that it is necessary to take them into consideration when creating interventions for reducing anxiety. It is important for the psychologists, coaches and expert teams who work with athletes to get familiarized with their traits and, based on that, develop the ways and strategies for reducing anxiety, and all of this needs to be done for the sake of better achievements in sports. This study provided a better understanding of the personality traits of athletes that contribute to state of anxiety, coping with challenges and reacting in competitive situation.

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