PERSONALITY OF GYMNASTS AND COPING STRATEGIES TO MANAGE STRESS

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Abstract

The reason why some gymnasts give an excellent performance and others are barely able to give average performance in competition may be embedded in the sphere of personality structure. Stress is the body's response to the imbalance between the demands of the external environment and the body's ability to meet those requirements. Therefore, the aim of our study is to investigate the relationship between personality structure of gymnasts and coping strategies to manage stress. The study sample consisted of 56 elite Slovak gymnasts (16 men and 40 women) aged from 15 to 26, with an average age of 19.34 ± 3.15 years. The personality structure of gymnasts was investigated by the NEO-FFI inventory (Ruisel & Halama, 2007). Coping strategies to manage stress were investigated by the Athletic Coping Skills Inventory ACSI-28 (Smith et al., 1995). The correlational research design was used. The results of our study showed that 6 of the 7 subscales of coping strategies to manage stress are in relation to personality structure of the gymnasts, namely emotional lability/stability, extroversion/introversion and openness to experience. We also found that none of subscales of coping strategies to manage stress is in relationship to an agreeableness and conscientiousness of gymnasts. A better understanding of the personality traits and coping strategies to manage stress may help coaches and sports psychologists to develop effective interventions and assist gymnasts to attain optimal performances in competition.

Keywords: *coping strategies, personality traits, stress, gymnasts, sports psychology.*

INTRODUCTION

Competition is associated with a multitude of various feelings, athletes feel excitement or enthusiasm and believe in achieving valued goals which bring them coveted happiness and satisfaction with performance (Skinner & Brewer, 2004). Sometimes athletes feel also scared due to which they become nervous, their muscles get tense, their stomach pains, body becomes tight, hands become clammy, and negative thoughts predominate them and hence they start believing that they will never win a big competition (Bhambri, Dhillon & Sahni, 2005). These feelings can be accompanied by a stress response. The stress is defined as a physical and mental demand, which tends to disturb the homeostasis of the human body (Bali, 2015).

There are only few studies investigating stress and coping strategies to manage stress that monitors seven of subscales of psychological skills in sports (Bebetsos, 2015; Bebetsos & Antoniou, 2003; Daroglou, 2011; Christensen & Smith, 2016; Jooste, Steyn & Van den Berg, 2014; Skourtanioti & Bebetsos, 2008; Young & Knight, 2014). Whether

athletes are able to remain calm, even when things are going badly, monitors subscale of coping with adversity. Good sports performance in competition is also dependent on concentration, confidence and achievement motivation which evaluates subscale of concentration and subscale of confidence and achievement motivation. Athletes should be mentally prepared for performance and have stress under control during the competition. The level of these skills monitors subscale of goal setting and mental preparation and subscale of peaking under pressure. Sometimes it happens that athletes worry about what others will think if they perform poorly. These worries assess subscale called freedom from worry. The last subscale is coachability which evaluates openness and ability to listen to the coach's instructions what to improve the physical and mental skills of athletes (Smith, Schutz, Smoll & Ptacek,1995).

In high-risk sports (rock climbing, parachuting, bungee-jumping) athletes achieved the highest scores in subscale of confident and motivation achievement, as well as subscale of concentration. It seems that stay calm and know to focus on the tasks even when adverse or unexpected situations occur, is necessary for these high-risk sports (Young & Knight, 2014). In other sports, such as golf, athletes achieved the highest scores in subscales of coachability, confidence, and peaking under pressure. It seems that golfers used to accept constructive criticism without taking it personally and becoming upset what predispose them to be positively motivated and give maximum during competition (Christensen & Smith, 2016). The results indicated that psychological skills change depending on requirements in sport what also confirmed previous studies in basketball (Skourtanioti & Bebetsos, 2008), badminton (Bebetsos & Antoniou, 2003) or archery (Young & Knight, 2014).

Using the closed-skill sport of gymnastics, they found different cognitive patterns for U.S. Olympic qualifiers and nonqualifiers. The successful gymnasts were more self-confident, had a higher frequency of gymnastic dreams, and were more open to talking with coaches compared to unsuccessful gymnasts (Mahoney & Avener, 1977). Similar findings were found in case of archery where experienced athletes achieved a higher score in subscale of confidence and concentration, as well as subscale of freedom from worry compared to inexperienced athletes (Bebetsos, 2015). It seems that coping strategies to manage stress are not the same and vary according to athletic experiences in sport (Bebetsos, 2015; Bebetsos & Antoniou, 2003; Mahoney & Avener, 1977; Skourtanioti & Bebetsos, 2008).

Sports performance is often greatly influenced by the intensity of the athletes' emotions as well as their entry and stay in optimal zones. If emotions are in optimal zones, athletes are capable of good or excellent sports performance. If emotions get into dysfunctional zones, athletes feel negative emotions that weaken their performance (Hanin, 2000; Robazza, 2006; Robazza, Pellizzari, Bertollo & Hanin, 2008). It was found that psychological skill help athletes maximize their physical skills (Smith et al., 1995). Using coping strategies to manage stress in competition, it is possible to increase sports performance, which declared studies investigating the relationship between coping strategies and sports performance in various sports, such as golf (Christensen & Smith, 2016), baseball (Kimbrough, Debolt & Balkin, 2007), basketball (Karamousalidis, Bebetsos & Laparidis, 2006; Vidic, Martin & Oxhandler, 2017), cricket (Jooste, Van Wyk & Steyn, 2013), football (Jooste et al., 2014) or volleyball (Schellenberg, Gaudreau & Crocker, 2013).

There are inventories that help sports psychologists categorize athletes into groups according to a level of personality traits. One of them is Five-factor Personal Inventory NEO-FFI which evaluates 5

dimensions of athlete´s personality (Costa & McCray, 1992). The conscientiousness factor describes individual's task orientation and goal-orientation behaviors as well as their level of impulse control (Trninic, Barancic & Nazor, 2008). An individual's level of adventurous and self-seeking qualities assesses openness to experience factor (McCrae & Sutin, 2007). The agreeableness factor accounts for the quality of relationships with others and explains how individual acts towards others (Trninic et al., 2008). This inventory evaluates two ambivalent items of introversion and extroversion, as well as emotional lability and emotional stability. In case that athletes achieve a high score in these items it means that they are extroverted and emotionally labile. Otherwise, when athletes score low means they are introverted and emotionally stable (Costa & McCray, 1992; Ruisel & Halama, 2007). This inventory has been used in various sports, such as tennis (Kaplánová, 2018), rhythmic gymnastics (Lazarević, Petrović & Damnjanović, 2012), football (Mirzaei, Nikbakhsh & Sharififar, 2013) or ice hockey (Conway, 2016).

In general, sports such as gymnastics puts high demands on gymnasts already at an early age. It was found that elite gymnasts who spent long hours exercising and developing physical skills scored higher in personality inventory in comparison to amateur gymnasts, specifically in items of openness, agreeableness and consciousness (Lazarević et al., 2012). It seems that gymnasts who were more organized, responsible, imaginative and artistically based achieved better results in comparison to gymnasts who were irresponsible, careless and narrow interests. It was also found that young gymnasts achieved a low score in item monitoring extroversion and introversion. It means that gymnasts are more introverted, quiet, reserved (Lazarević et al., 2012) compared to other sports, such as ice hockey, where hockey players achieved a higher score in the same item. It seems that hockey players are more active, energetic, enthusiastic, talkative what may be due to the nature of team sport (Conway, 2016). These findings provide valuable knowledge which may help coaches develop psychological skills athletes which declared many studies in sports (Kaplánová, 2018; Lazarević et al., 2012; Mirzaei et al., 2013).

Although there is study investigating personality traits of children from perspective five-factor model of personality in rhythmic gymnastics (Lazarević et al., 2012), as well as study monitoring psychological skills of gymnasts (Daroglou, 2011). Our study is an exploratory study because there is no study investigating personality traits of adolescents and adults of gymnasts from perspective five-factor model of personality, as well as there is no study investigating the tightness of relationship between personality traits and coping strategies to manage stress in gymnastics. The aim of our study is to investigate the relationship between personality structure of gymnasts, namely emotional lability/stability, extroversion/introversion, conscientiousness, agreeableness and openness to experience and coping strategies to manage stress. Based on previous findings, we have formulated a research question. Are there any relationships between five-factors personality traits of gymnasts, namely emotional lability/stability, extroversion/introversion, conscientiousness, agreeableness and openness to experience, and all subscales of psychological skills, namely coping with adversity, coachability, concentration, confidence and achievement motivation, goal setting and mental preparation, peaking under pressure, as well as subscale of freedom from worry?

METHODS

The study sample consisted of 56 elite Slovak gymnasts (16 men and 40 women) aged from 15 to 26, with an average age of 19.34 ± 3.15 years. All gymnasts were registered in the Slovak Gymnastics Federation (SGF) and had experiences with national or international competitions in categories: sport aerobics (n = 12), rhythmic gymnastics (n = 10), women artistic gymnastics (n = 10), men artistic gymnastics (n = 6) and gymnastics for all (n=18). The gymnasts trained in average for 25 hours a month (SD = 5.24).

Athletic Coping Skills Inventory (ACSI-28) is a validated tool that commonly used to discover the level of coping skills among athletes. It is composed of 28 items and 7 sport specific sub-scales, which are used to reflect a multidimensional construct of psychological skills. Each statement in the inventory describes experiences of other athletes, which prompts the participant to indicate the frequency of similar experiences. The response format for each item consists of a linear 4-point scale ranging from 0 (almost never) to 3 (almost always). Scores range from a low of 0 to a high of 12 on each subscale, with higher scores indicating greater strengths on that subscale. The score for the total scale ranges from a low of 0 to a high of 84, with higher scores signifying greater strength. Description of sub-scales of Athletic Coping Skills Inventory ACSI-28 (Smith et al., 1995) we present in table 1.

Table 1
Description of sub-scales of Athletic Coping Skills Inventory ACSI-28 (Smith et al., 1995).

Sub-scales	Athletic Coping Skills Inventory ACSI-28
1 Coping with Adversity	This subscale assesses if an athlete remains positive and enthusiastic even when things are going badly, remains calm and controlled, and can quickly bounce back from mistakes and setbacks.
2 Coachability	Assesses if an athlete is open to and learns from instruction and accepts constructive criticism without taking it personally and becoming upset.
3 Concentration	This subscale reflects whether an athlete becomes easily distracted or is able to focus on the task, even when adverse or unexpected situations occur.
4 Confidence and Achievement Motivation	Measures if an athlete is confident and positively motivated, consistently gives 100% during practices and competition, and works hard to improve his/her skills.
5 Goal Setting and Mental Preparation	Assesses whether an athlete sets and works toward specific performance goals, plans and mentally prepares for competition, and clearly has a future plan for performing well.
6 Peaking under Pressure	Measures if an athlete is challenged rather than threatened by pressure situations and performs well under pressure.
7 Freedom from Worry	Assesses whether an athlete puts pressure on him- or herself by worrying about performing poorly or making mistakes; worry about what others will think if he or she performs poorly.

Table 2
Description of dimensions of Five-factor personal inventory NEO-FFI(Ruisel & Halama, 2007).

Five-factor personal inventory NEO-FFI		
People with high scores	*Dimensions*	*People with low scores*
Anxious, Touchy, Unstable, Worrying	Emotional Lability vs. Stability	Stable, Calm, Contented, Unemotional
Active, Energetic, Enthusiastic, Talkative	Extroversion vs. Introversion	Quiet, Reserved, Silent, Withdrawn
Artistic, Original, Imaginative, Insightful	Openness to Experience	Narrow Interests, Commonplace, Simple, Shallow
Appreciative, Forgiving, Generous, Kind	Agreeableness	Cold, Thankless, Stingy, Unkind
Organized, Responsible, Reliable, Planful	Conscientiousness	Disorderly, Irresponsible, Forgetful, Careless

The personality structure of gymnasts was investigated by Slovak version of Five-factor Personal Inventory NEO-FFI (Costa & McCray, 1992) revised by Ruisel and Halama (2007). The inventory was translated into more than 30 languages across the world, what ensures wider comparability of results even in different areas of sport. It is composed of 60 items and 5 dimensions which are used to describes the structure of personality. The inventory monitors personality dimensions: (1) emotional lability/stability, (2) extroversion/introversion, (3) openness to experience, (4) agreeableness and (5) conscientiousness. Each statement in the inventory describes experiences of other people, which prompts the participant to indicate the frequency of similar experiences. The gymnasts recorded the answer on a linear 5-point scale (0 – strongly disagree, 1 – disagree, 2 – neutral, 3 – agree, 4 – strongly agree). Scores range from a low of 0 to a high of 48 on each dimension, the score for the total scale ranges from a low of 0 to a high of 240. Descriptive characteristics of people with high/low scores in Five-factor Personal Inventory NEO-FFI (Ruisel & Halama, 2007) we present in table 2.

Out of respect for research ethics data were collected anonymously with informed consent of the respondents or their legal representatives. Slovak Gymnastic Federation (SGF) and gymnasts involved in the research, were informed about the goals and objectives of data collection and their use for research purposes. Data were collected and administered by sports psychologist. The study used the correlational research design in order to assess the closeness of relationships between the personality structure of gymnasts and coping strategies to manage stress. We used a correlation analysis with Spearman correlation coefficient, which is used in the non-parametric distribution of data (Daniel, 1990). The tightness of relationship was assessed for 5% and 1% of the level of statistical significance. Cronbach's alpha indices were calculated for both measures employed in the study to ensure the reliability of these inventories for the particular data-set (Cronbach, 1951). The data were analyzed using the SPSS statistical program (Version 23 for Windows, IBM, Armonk, NY, USA).

RESULTS

The internal consistency of Five-factor personal inventory NEO-FFI reached the following values: emotional lability/stability $\alpha = .87$; extroversion/introversion $\alpha = .76$; agreeableness $\alpha = .74$, conscientiousness $\alpha = .82$ and openness to experience $\alpha = .67$. Although item of openness to experiences

reached internal consistency below .70, we consider this value of reliability as acceptable because is 0.1 higher than the average for the Slovak sample in the standard version of Five-factor personal inventory NEO-FFI (Ruisel & Halama, 2007). The internal consistency of Athletic coping skills inventoryACSI-28 reached the following values: coping with adversity α = .78, coachability α = .77, concentration α = .70, confidence and achievement motivation α = .72, goal settings and mental preparation α = .72, peaking under pressure α = .75 and freedom from worry α = .78.

Descriptive statistics were used to give an indication of mean scores on subscales of psychological skills, as well as five-factor of personality structure of gymnasts. The descriptive statistics also included a range of both scales and standard deviations. The results of descriptive statistic suggested that it is impossible to determine exactly whether the adolescent and adult gymnasts are more emotionally labile or stable because they on average scored exactly at the border of emotional lability and stability what we presented in table 3.

Table 3
Descriptive statistics of gymnasts.

	Range of the scale	M	SD
Five-factor Personal Inventory NEO-FFI			
1 Emotional Lability/Stability	0-48	23.96	9.94
2 Extroversion/Introversion	0-48	16.79	7.03
3 Openness To Experience	0-48	19.89	6.82
4 Agreeableness	0-48	19.66	7.23
5 Conscientiousness	0-48	13.73	7.48
Total Score	0-240	94.04	17.84
Athletic Coping Skills Inventory ACSI-28			
1 Coping With Adversity	0-12	7.14	2.28
2 Coachability	0-12	8.70	2.56
3 Concentration	0-12	7.32	2.05
4 Confidence and Achievement Motivation	0-12	7.54	1.98
5 Goal Setting and Mental Preparation	0-12	7.52	2.31
6 Peaking Under Preassure	0-12	5.93	2.59
7 Freedom From Worry	0-12	5.82	3.21
Total Score	0-84	49.96	9.12

Table 4
Results of correlation analysis between Five-factor personal inventory NEO-FFI and Athletic Coping Skills Inventory ACSI-28.

Athletic Coping Skills Inventory ACSI-28	Five-factor personal inventory NEO-FFI				
	Emotional Lability/Stability	Extroversion/ Introversion	Openness to Experiences	Agree-ableness	Conscien-tiousness
1 Coping with Adversity	.41**	**-.32***	.22	-.19	-.26
2 Coachability	.10	**-.37****	.02	-.03	-.25
3 Concentration	.26	-.18	**.39****	-.08	-.04
4 Confidence and Achievement Motivation	.20	**-.32***	**.33***	.05	-.16
5 Goal Setting and Mental Preparation	-.08	-.15	.14	-.05	-.04
6 Peaking under Pressure	.23	-.25	**.29***	.08	-.12
7 Freedom from Worry	.46**	.15	.10	-.01	-.20

Note: *p<.05, **p<.01

In table 3 also we can see that in other items they achieved low scores which indicate a preference for introversion, less openness to experiences, as well as less agreeableness and conscientiousness. In second inventory gymnasts achieved the highest score in subscale of coachability. They also have higher scores also in items coping with adversity, concentration, confidence and achievement motivation, as well as goal setting and mental preparation. In last items called peaking under pressure and freedom from worry gymnasts achieved low scores. In table 3 are also presented mean of total scores which adolescent and adult gymnasts achieved in both inventories. The results of correlation analysis between the personality structure of gymnasts and their coping strategies to manage stress are presented in table 4.

The results of our study showed that there is the closeness of relationships between the personality structure of gymnasts and coping strategies to manage stress. We found a positive significant correlation between coping with adversity and emotional lability/stability (r_s = .41; p = .002) and negative significant correlation between coping with adversity and extroversion/introversion (r_s = -.32; p = .018). We also found a negative significant correlation between coachability and extroversion/introversion (r_s = -.37; p = .005). Other negative statistically significant correlations were found between concentration and openness to experience (r_s = -.39; p = .003), as well as between peaking under pressure and openness to experience (r_s = -.29; p = .032). Positive statistically significant correlations were also found between freedom from worry and emotional lability/stability (r_s = .46; p = .000). Negative statistically significant correlations were also found between confidence and achievement motivation and extroversion/introversion (r_s = -.32; p = .016) and positive significant correlation between confident and achievement motivation and openness to experience (r_s = .33; p = .014). We found that 6 of the 7 subscales of coping strategies to manage stress are in relationship to personality structure of the gymnasts, namely emotional lability/stability, extroversion/introversion and openness to experience. We also found that none of subscales of coping strategies to manage stress is in relationship to an agreeableness and conscientiousness of gymnasts.

DISCUSSION

In present, there are only few studies investigating personality traits of elite athletes from perspective five-factor model of personality (Kaplánová, 2018, Mirzaei et al., 2013). Although there is a study of personality traits of children in rhythmic gymnastics (Lazarević et al., 2012) until now there is no study monitoring personality traits of elderly gymnasts in adolescence or adulthood. Our study is one of the first which monitor a level of personality traits of elderly gymnasts from perspective five-factor model of personality. Analysis of this model showed that gymnasts achieved very low scores in items of extroversion/introversion and agreeableness what means that adolescent and adult gymnasts are more introverted, quieter and reserved compared to athletes of team sports. The preference of extroversion and agreeableness in team sports, such as football or ice hockey, may also be caused by the nature of this type of sport where there is a need for player cooperation (Mirzaei et al., 2013; Conway, 2016). Low level of conscientiousness and openness to experience suggests the needs for developing self-seeking qualities, as well as self-disciplined and ambitious of gymnasts (McCrae & Sutin, 2007). The results of our study also showed that still is not possible to interpret clearly that adolescent and adult gymnasts are more emotionally labile or stable because they on average scored exactly at the border of this item which is consistent with findings in tennis (Kaplánová, 2018). This is mainly due to a wide range of responses monitoring emotional lability/stability which in the case of football players is more uniform (Mirzaei et al., 2013).

Previous research showed that psychological skills change according to requirements in sport what confirmed studies in basketball (Skourtanioti & Bebetsos, 2008), badminton (Bebetsos & Antoniou, 2003) or archery (Young & Knight, 2014). Therefore, it is necessary to monitor coping strategies to manage stress not only for children´s gymnasts (Daroglou, 2011) but also for elderly elite gymnasts. The results of our study showed that adolescent and adult gymnasts scored higher in items of coachability, coping with adversity, concentration, confident and achievement motivation, goal setting and mental preparation, peaking under pressure, as well as freedom from worry compared to young elite gymnasts competed at the Hellenic Championship of Rhythmic Gymnastics (Daroglou, 2011). The highest differences between young gymnasts and elderly gymnasts were recorded in subscale of coachability. On the contrary, the smallest difference was recorded in subscale of freedom from worry. It seems that adolescent and adult gymnasts are more openness and ability to listen to coach´s instructions than young gymnasts, but they still worry about others will think if they perform poorly. On the basis of previous findings, there is a well-founded need for a better understanding to develop of the psychological skills which can reduce stress in competition and increase sports performance of gymnasts (Smith et al., 1995).

Our study is one of the first which found out a relationship between personality traits of adolescent and adult gymnasts and coping strategies to manage stress. It seems that there are some personality traits who predispose athletes to achieve better results in competition (Christensen & Smith, 2016; Jooste et al., 2014; Kaplánová, 2018). Analysis of a five-factor model of personality showed that is very important to focus on three personality traits of gymnasts, mainly emotional lability/stability, extroversion/introversion and openness to experience. Ability to remain calm in stressful situations and also know to quickly bounce back from mistakes or setbacks is one of the important factor successful performance in competition (Smith et al., 1995). We found out that a high level of this psychological skill is in

relation to a high level of emotional lability, as well as a high level of introversion of gymnasts. It seems that gymnasts who are more reserved, silent, focus on subjective experiences and trusting their intuition can be more resistant against mistakes or failures. High level of introversion also predisposes adolescent and adult gymnasts to listen to coach and accepts constructive criticism without taking it personally and becoming upset. The results of our study also showed that gymnasts with a high level of openness to experience are probably able to focus on the task better, even when adverse or unexpected situations occur. This may be due to the fact that adolescent and adult gymnasts are more artistically gifted, their life is full of experiences that survive more markedly. Good sports performance in competition is also depending on confidence and achievement motivation (Smith et al., 1995). We found out that gymnasts who have a high level of introversion and a high level of openness to experiences are probably able to be positively motivated and works hard to improve their skills. High level of openness to experience also predispose adolescent and adult gymnasts a good stress management and they are able to give better performance compared to athletes with a low level of openness to experience. We also found that gymnasts with a high level of emotional lability are probably less worried about the bad things that could happen to them.

Based on previous research findings, we can formulate the following recommendations for practice. The results of our study showed that adolescent and adult gymnasts are more introverted, quieter and more reserved what is probably necessary given the requirements of this type of sport. Introverted people are more inclined to keep their feelings to themselves and deal with issues alone compared to extroverted people (Leary & Buckley, 2000). Introverted people also prefer a few close relationships compared to extroverted people who spend a lot of time interacting with people in social situations (McCrae & Sutin, 2007). It seems gymnasts are capable to create a close relationship with another person but it takes them for a while. The introverted people may give off the impression that they do not want to receive attention from others (Leary & Buckley, 2000). Therefore, the coach should be patient in building a relationship with the gymnast. A close confidential relationship between a coach and a gymnast based on honesty, openness and understanding can be one of the ways how to create the emotional comfort of a gymnast not only during the training but also in competition. Furthermore, we also found that a higher level of openness to experience correlate with concentration, confidence and achievement motivation. Thus, it is necessary to work on an individual's level of adventurous and self-seeking qualities of gymnasts which can improve sports performance of gymnasts under pressure. The results suggest that a higher level of openness to experience can help the gymnast easier to cope with the pressure in the competition.

The results of Spearman correlation also showed a tightness relationship between emotional lability and subscales coping with adversity and freedom from worry. It seems that the dose of emotion and impulsivity inserted into performances helps to quickly bounce back from mistakes or setbacks. Gymnasts probably are able to remember emotional performances longer and thus avoid repeated mistakes.

Limits

Although our study sample of elite gymnasts considered as representative for the conditions of Slovakia. In the future, we recommend exploring a wider research sample and compare results with findings in other countries.

CONCLUSIONS

The results of our study showed that coping strategies to manage stress vary according to levels of emotional lability/stability, extroversion/introversion and openness to experience of gymnasts. A better understanding of the personality traits and coping strategies to manage stress to extend knowledge of sports psychology and may help coaches and sports psychologists to develop effective interventions and assist athletes to attain optimal performances in competitions.

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