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TEMPERAMENT STRUCTURE AND WAYS OF COPING WITH STRESS AMONG PROFESSIONAL SOCCER AND BASKETBALL PLAYERS

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Abstract. The temperamental traits play a crucial role in the process of the adjustment of an individual to the requirements of the environment: at school, at work and, of course, in sport activity [3,19]. In the research on stress, temperament has the status of a moderator (i.e. a condition preceding a given phenomenon in time) that modifies stressors, the state of stress, the ways of coping with stress, and the consequences of the state of stress [21]. The purpose of this study was to investigate and describe relations between temperament structure and ways of coping in stressful situations. The subjects - 104 top level athletes (54 soccer players and 50 basketball players) - completed "The Formal Characteristics of Behaviour – Temperament Inventory" (FCB – TI) by B. Zawadzki and J. Strelau and "The Coping Inventory for Stressful Situations" (CISS) by N. S. Endler and J .D. A. Parker. Results indicate that there is significant relationship between the temperamental traits and the ways of coping especially in case of Emotion–Oriented Coping that correlates with Briskness (r=-0.41, p=0.01), Perseverance (r=0.47, p=0.01), Sensory Sensitivity (r=-0.24, p=0.05), Emotional Reactivity (r=0.64, p=0.01) and Endurance (r=-0.47, p=0.01). Avoidance–Oriented Coping correlates with Activity (r=0.28, p=0.01). Task–Oriented Coping correlates with Briskness (r=0.25, p<0.05), Emotional Reactivity (r=-0.23, p<0.05) and Endurance (r=0.20, p=0.05). The results indicate that the temperamental traits can be important predictors of the style of coping with stress.

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Key words: Temperament - Coping with stress - Soccer players - Basketball players

Introduction

Coping well, not only in sport, but also in various challenging situations, both related to one's work and social life is generally connected with a high level of aspiration as well as with a large demand of stimulation [2,7,16]. Professional sport players quite frequently deal with stressful situations which require from them a lot of involvement and large capacity of their nervous system (e.g. social presentation,

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permanent evaluation, exposure to criticism, pressure for results and achievements, necessity of competition, etc.).

In team games athletes are exposed to further difficulties and challenges [10]. Besides external competition (competing against another team) they also cope with internal competition – fighting for a place in a team. The contact character of team games, such as basketball or football, causes additional emotions and makes athletes more susceptible to injuries. It so happens that athletes from the same team differ as far as age and experience are concerned, which may hinder communication and cooperation among them. Athletes must be ready to take on various social roles, e.g. task leader or emotional leader who is able to stimulate the team or to moderate their spirits. They also play a range of sports roles, e.g. a first team or reserve player. The specificity of team sports is the fact that athletes are required to subordinate their personal goals to team goals. Inconstancy of situation in the field results in emotion changes. Therefore, to act with efficacy athletes need the ability to 'cut off' emotions and focus on the task.

From the research carried out in the field of psychology it stems that temperament traits play a crucial role in the process of the adjustment of an individual to the requirements of the environment [3,9,19]. They determine the choice of the forms of activity, both of professional and sport character whose stimulation value is varied [32]. This concerns, in particular, the forms of activity which are connected with significant situational tension, referring both to the time and energy. Temperament is also related to another dimension, which defines resistance to stress, or, the other way round – large emotional sensitivity or emotional reactivity [26]. In accordance with the regulative theory of temperament [18,23,24,32] emotional reactivity is one of the so-called energy-defined traits of temperament.

The questions related to participation in sport events and natural selection concern one of the four main trends in the research of the role of temperament in sport activity. The other trends concentrate on the problems of training and teaching the sport players, reaction to start-related stress and sport achievements (so-called result-dependent selection) as well as on the issues related to sport specialisation [30].

From the analysis of the research into the role of temperament in sport activity it stems that Pavlov's thesis of the existence of so-called "crippled type" and deterministic model assuming the existence of a strong natural selection in sport have not been confirmed either in research or in practice [30]. It turns out that there are many extra-temperamental factors which may compensate the impact of temperament. The results of the research suggest that in mass and recreational sport

activities, most probably there is no temperament selection, whilst in professional sport it has a limited significance and does not concern all sport disciplines [30].

The examination of temperament with the FCB-TI scale (Formal Characteristics of Behaviour – Temperament Inventory), worked out by Zawadzki and Strelau, carried out among 203 players (juniors and seniors) representing 11 sport disciplines (individual and team ones), has shown that athletes, as compared with the population of people not practising record-seeking sport, obtained much higher results with regard to briskness, endurance and activity and significantly lower in emotional reactivity [32]. The data in the scale of sensory sensitivity did not differ from those obtained in general population. On the one hand, the results obtained confirm the existence of the phenomenon of natural selection in sport, however, this phenomenon is not as strong as it was previously expected, and it is stronger in the case of women. On the other hand, the results of the research prove the necessity of further empiric verification which, among others, should take into consideration the specifics of particular sport disciplines.

The researchers dealing with analysis of the relation between temperament and stress point to the following issues: the influence of temperament on the intensity of the sensors, the role of temperament as the factor determining the state of stress, moderating effect of temperament in coping with stress and the participation of temperament traits in psycho- physiological and/or psychological costs of the state of stress [20,21].

In the field of sport psychology, the interest in the problems of coping with stress concentrates first of all on the issues concerning particular techniques and strategies of coping [1,12] and on the reactions to stress situations [4,11].

The present article concentrates on the issues concerning temperament and on the problems of the styles of coping with stress. The authors are interested whether there exists – and if so – what character it has – a relationship between the structure of temperament and the styles of coping with stress in a group of sport players practicing professional soccer or basketball. In other words, whether the choice of a certain style of coping with stress is related to a specific type of temperament.

The term "temperament" is understood as "a set of relatively stable traits having a biological background. These traits are present since early childhood; they may be present in men and animals and they are expressed mainly in the formal characteristics of behaviour" [17].

In accordance with The Regulative Theory of Temperament [18,19,23,31], which forms a starting point for our research, temperament consists of six traits. Briskness and perseverance are time-defined dimensions. Sensory sensitivity, emotional reactivity, endurance and activity are energy-defined dimensions.

Particular dimensions will be described during the presentation of the tools applied in the research.

The term "stress" is understood as a state in which an individual experiences strong negative emotions, such as fear, anger or hostility. These emotions are accompanied by physiological and biochemical changes which significantly exceed the stationary level of activation [19,20]. The condition of stress is caused by the lack of balance (the existence of discrepancies) between the requirements and individual possibilities concerning coping with them [20]. These possibilities may be of objective or subjective character [14,22,23].

The notion of stress is also related to such terms as coping and the style of coping with stress. Coping plays a regulatory function. Effective coping decreases the state of stress and consists in balance between requirements and possibilities. Ineffective coping leads to the increase of stress [6,22].

The style of coping with stress means the way of behaviour in various difficult situations characteristic of a given individual [28]. This is relatively a permanent tendency whose aim is to remove or reduce stress [22]. The term "style" must be differentiated from such terms as "strategy" and "process". Strategy means some defined, concrete activity or reactions, whilst the process of coping – is a sequence of strategies which can change over time [8,19,22,28,29].

On the basis of the available state of knowledge and the results of the research carried out so far concerning the relation between the temperament traits and styles of coping with stress [13,19,21,22,27,30] we suppose that in the examined group of sport people there will be a positive relation between the structure of temperament indicating high possibilities of processing stimulations and task-oriented style of coping with stress. In the light of the Regulative Theory of Temperament, this means a positive relation with such temperament traits as: briskness, endurance, activity and a negative relation with perseverance and emotional reactivity.

We also expect to observe a positive relation between the structure of temperament indicating limited possibilities of stimulations processing and the style of coping with stress concentrated on emotions. In accordance with the Regulative Theory of Temperament this means a negative relation with briskness, endurance, activity and a positive one with perseverance and emotional reactivity. As far as sensory sensitivity is concerned, it is fairly difficult to formulate opinions concerning the relationship of this dimension with coping styles. Perhaps the examined groups which differ regarding the sport discipline which they practise will also differ with regards to the strength and dimension of the relation between sensory sensitivity and stress coping styles.

We suppose that the stress coping style concentrated on avoidance, manifested in the involvement in substitute activity and/or search for social contacts will prove to have strongest relationship with temperament activity.

The proposed research will allow us to collect information not only of theoretical, but also of practical significance. It may be helpful in the work with players while working out optimal ways of coping in stressful situations connected with sport activity.

Materials and Methods

Participants: The subjects of the research were 104 professional players representing such sport games as soccer and basketball. The group was homogenous with respect to the sex and consisted of 54 extra-class soccer players and 50 basketball players from extra-league. The average age was M=27.04; with SD=5.21.

Measures: The research was conducted with the tools with proven psychometric parameters which meet the requirements for scientific research. These tools are generally applied in psychological diagnostics. The independent variable - temperament – was measured by FCB-TI scale (Formal Characteristics of Behaviour – Temperament Inventory). The styles of coping with stress, which were the dependent variable, were assessed using CISS scale (The Coping Inventory for Stressful Situations).

The Formal Characteristics of Behaviour–Temperament Inventory (FCB – TI) by B. Zawadzki and J. Strelau [32].

FCB – TI allows measuring temperamental traits that refer to the formal characteristics of behaviour and includes 6 scales, such as: briskness (BR), perseverance (PE), sensory sensitivity (SS), emotional reactivity (ER), endurance (EN) and activity (AC). Two first traits i.e. briskness and perseverance, refer to time parameters, whilst the remaining four refer to energy parameters. Below we present a short description of particular temperament traits [23]:

Briskness – tendency to react quickly, to keep a high tempo of performing activities, and to shift easily in response to changes in the surroundings from one behaviour (reaction) to another.

Perseverance – tendency to continue and to repeat behaviour after cessation of stimuli (situations) evoking this behaviour.

Sensory sensitivity – ability to react to sensory stimuli of low stimulative value.

Emotional reactivity – tendency to react intensively to emotion-generating stimuli, expressed in high emotional sensitivity and in low emotional endurance.

Endurance – ability to react adequately in situations demanding long-lasting or high stimulative activity and under intensive external stimulation.

Activity – tendency to undertake behaviour of high stimulative value or to supply of behaviour strong stimulation from the surroundings.

The Coping Inventory for Stressful Situations (CISS) by N.S. Endler and J.D.A. Parker.

CISS consists of 3 scales: task – oriented coping (TOC), emotion – oriented coping (EOC) and avoidance – oriented coping (AOC) composed of 2 subscales: involving in substitute activity (ISA) and social contacts seeking (SCS) [22,25,28]. The scales presented refer to the three styles of coping with stress. They are as follows:

- Task-oriented style means the tendency to undertake efforts aiming at solving problems by means of their cognitive processing or attempts to change the situation. The main focus is laid on the task or planning to solve the problem;
- Emotions-oriented style means a tendency in a stressful situation to concentrate on oneself, on own emotional experiences, tendencies to wishful thinking and fantasising. These actions aim at the decrease of emotional tension connected with stressful situation;
- Avoidance oriented style means a tendency in stressful situations to avoid thinking of, going through or experiencing such situations. This may take two forms: involving in substitute activity (ISA) or social contacts seeking (SCS).

The subjects of the research are described from the point of view of all the three styles having the statutes of a dimension as each person occupies a characteristic place against these three dimensions. The authors of the questionnaire refer to the concept of Lazarus and Folkman and they assume that the style of coping, as opposed to defence mechanisms, is a conscious action.

Procedures: The research was carried out in Poland. The results were unified. The players filled in questionnaires in groups of a few persons. Each time the subjects were informed about the aim of the research. Filling in questionnaires took about 20 min.

Results

In order to establish correlation between the structure of temperament and the stress coping style a correlation ratio according to the R Pearson correlation coefficient was applied. The obtained results are presented in three tables: for the entire group (Table 1), for soccer players' subgroup (Table 2) and for basketball players' subgroup (Table 3).

Temperament structure and ways of coping among soccer and basketball players: Table 1 contains the results of the correlation between the temperament dimensions measured with the FCB-TI questionnaire and stress coping styles measured with the CISS questionnaire. The results concern the entire group of the players examined.

Table 1
Correlations between temperamental scales and ways of coping with stress in all research group (soccer players and basketball players; n=104). SP: soccer players; BR: briskness; PE: perseverance; SS: sensory sensitivity; ER: emotional reactivity; EN: endurance; AC: activity; WOC – Ways of Coping; TOC: task-oriented coping; EOC: emotion-oriented coping; AOC: avoidance-oriented coping; ISA: involving in substitute activity; SCS: social contacts seeking

WOC	Structure of Temperament					
	BR	PE	SS	ER	EN	AC
T-OC	0.25*	-0.13	0.18	-0.23*	0.20*	0.18
E-OC	-0.41**	0.47**	-0.24*	0.64**	-0.47**	-0.18
A-OC	-0.11	0.16	-0.12	0.09	-0.02	0.28**
ISA	-0.15	0.14	-0.21*	0.17	-0.09	0.16
SCS	0.03	0.02	0.02	-0.13	0.19	0.37**

**correlation is significant on the level 0.01 bilaterally
*correlation is significant on the level 0.05 bilaterally

From among thirty correlation co-efficients, eleven proved to be statistically significant. The strongest relationship was found in the case of emotional reactivity (ER) and emotions- emotion-oriented coping (r 0.64). This coping style correlates also with four other temperament scales: positively with perseverance (PE) (r 0.47) and negatively with briskness (BR); (r-0.41), sensory sensitivity (SS) (r-0.24) and endurance (EN) (r-0.47).

Three temperament scales correlate with task-oriented coping. These are: briskness (r 0.25) and endurance (r 0.20) as well as emotional reactivity (r-0.23).

In the case of avoidance oriented coping, the correlation with activity proved to be significant (r 0.28), and activity scale correlates also with the social contacts

seeking subscale. A negative correlation was also found between the subscale of involving in substitute activity and sensory sensitivity (r-0.21).

Temperament structure and ways of coping among soccer players: From the comparison of correlation coefficients calculated for soccer players (Table 2), it stems that the strongest correlations exist between temperament scales and emotion-oriented coping (E-OC). They have the same direction and – in the case of perseverance (PE) – similar values (r 0.46) as the correlation coefficients for the whole group (Table 1). Perseverance correlates also with avoidance-oriented coping (A-OC) (r 0.28) and involving in substitute activity (ISA) (r 0.30). The strongest connection proved to be between emotional reactivity (ER) and emotion-oriented coping (E-OC) (r 0.73).

Table 2
Correlations between temperamental scales and ways of coping with stress in soccer players group (n=54).SP: soccer players; BR: briskness; PE: perseverance; SS: sensory sensitivity; ER: emotional reactivity; EN: endurance; AC: activity; WOC – Ways of Coping; T-OC: task-oriented coping; E-OC: emotion-oriented coping; A-OC: avoidance-oriented coping; ISA: involving in substitute activity; SCS: social contacts seeking

Group	WOC	Structure of Temperament					
		BR	PE	SS	ER	EN	AC
SP	T-OC	0.27	-0.11	0.24	-0.23	0.18	0.07
	E-OC	-.47**	.46**	-.31*	.73**	-.55**	-0.24
	A-OC	-0.19	.28*	-0.15	0.21	-0.08	0.27
	ISA	-.28*	.30*	-0.26	.31*	-0.25	0.09
	SCS	0.13	-0.03	0.08	-0.15	.41**	.48**

**correlation is significant on the level 0.01 bilaterally
*correlation is significant on the level 0.05 bilaterally

From the data obtained (Table 2) it stems that in the group of soccer players, none of the calculated correlations for temperament scales and task-oriented coping proved to be significant. Interesting results were obtained in the case of avoidance oriented coping (A-OC) scale and its sub-scales: involving in substitute activity (ISA) and social contacts seeking (SCS). The first two (A-OC and ISA) correlate

significantly with time-defined dimension of temperament whilst the third one – SCS – correlates with endurance (EN) and activity (AC), both of which belong to energy-defined dimensions of temperament, both related to actions.

Temperament structure and ways of coping among basketball players: In Table 3, correlation coefficients calculated for the basketball players were presented. Only seven from amongst thirty coefficients are statistically significant on the level 0.05 or higher.

Table 3
Correlations between temperamental scales and ways of coping with stress in basketball players group (n=50). BP: basketball players; BR: briskness; PE: perseverance; SS: sensory sensitivity; ER: emotional reactivity; EN: endurance; AC: activity; WOC – Ways of Coping; T-OC: task-oriented coping; E-OC: emotion-oriented coping; A-OC: avoidance-oriented coping; ISA: involving in substitute activity; SCS: social contacts seeking

Group	WOC	Structure of Temperament					
		BR	PE	SS	ER	EN	AC
BP	T-OC	0.24	-0.14	0.14	-0.23	0.21	0.29*
	E-OC	-0.36**	0.48**	-0.18	0.53**	-0.37**	-0.08
	A-OC	-0.02	0.01	-0.11	-0.06	0.06	0.32*
	ISA	-0.01	-0.05	-0.15	-0.02	0012	0,27
	SCS	-0.06	-0.01	-0.06	-0.13	0.03	0.31*

**correlation is significant on the level 0.01 bilaterally
*correlation is significant on the level 0.05 bilaterally

As it stems from the data presented in Table 3, activity scale (AC) correlates with task-oriented coping (T-OC) (r 0.29), avoidance-oriented coping (A-OC) (r 0.32) and social contacts seeking (SCS) (r 0.31). The four remaining correlations significantly refer to emotion-oriented coping (E-OC) and briskness (BR) (r-0.36), perseverance (PE)(r 0.48), emotional reactivity (ER) (r 0.53) as well as endurance (EN) (r-0.37).

Discussion

The research carried out provides a lot of information on the basis of which it was possible to verify the hypotheses which were formulated. The results may only suggest that there is some correlation between temperament structure indicating large possibilities of processing stimulation and task-oriented stress coping style. The direction of the correlation both in the entire group of the subjects and also in each of the sub-groups was confirmed, however only in the case of briskness, emotional reactivity and endurance – the correlation coefficients calculated for the whole group (Table 1) proved to be significant – as well as the correlation coefficient concerning activity – referring to the group of basketball players (Table 3). The results were also compared with the results of the research carried out by Turosz [27] and Strelau *et al.* [22]. Turosz carried out research amongst 22 players representing individual disciplines and 22 players representing team disciplines (basketball, handball and volleyball). The results which she obtained (i.e. the strength and direction of the relations) do not allow to state that there is a relation between the temperament traits indicating high possibilities of stimulation processing and task-oriented coping style. The only significant correlation was found in the case of activity. The research carried out by Strelau *et al.* [22], which comprised more than 1000 subjects at the age of 13-85 years, divided into three groups (one and two-egg twins, victims of flood examined 24 months after the occurrence and flood victims examined 15 months after the occurrence) the relation between the temperament traits and task-oriented coping style proved to be significant. It should however be stressed that – in comparison with Strelau's research – in our study, the correlation with perseverance has a negative direction, and correlation coefficients referring to emotional reactivity and endurance have higher values (Table 1). Most probably the fact that the sport people whom we examined were a homogenous group with regard to sex, age and the discipline (which means a dominating activity) as well as sport level, significantly affected the obtained results. The second hypothesis referring to the existence of a positive correlation between the temperament structure indicating small possibilities of processing stimulation and emotions-oriented coping style was confirmed. In the whole group, and in each of the subgroups, a significant correlation with time-defined characteristics of temperament was obtained – (a negative one with briskness and a positive one with perseverance) and with at least two energy-defined characteristics (a negative one with endurance and a positive one with emotional reactivity). In the whole group as well as in the soccer players'

subgroup, there was also a negative correlation with sensory sensitivity – similarly as in the case of the studies of Strelau *et al.* [22].

The results of the research carried out indicate clearly that the relation between temperament and coping styles is the strongest in the case of emotions-oriented coping style. This means that the players who do not have a large tolerance to physical stimuli and do not manifest a tendency of fast and adequate reaction and an easy change of behaviour (reaction) comforting to the requirements posed by a situation and at the same time have a tendency to repeat a particular behaviour and to react with a strong emotional upheaval, in stressful situations they tend to concentrate on themselves and their own emotional experiences. They undertake first of all such actions which aim at decreasing emotional tension. The studies carried out by Turosz [27] showed that about 70% players, irrespectively of the discipline which they practiced, prefer task-oriented coping style which means readiness to undertake efforts aiming at a solution of the problem, attempt to change the situation and plan to solve the problem. This style matches the image of a resourceful person who is well adapted to a situation and who can remain effective in stressful situations. On the other hand it is also known that the phenomenon of temperamental selection in sport has a much smaller range that it was originally expected and that among sport players of high record-seeking sport activity there are people with various temperament and personality types [5,30]. This may signify that a player, wanting to meet the expectations of his environment and be perceived as a person who can cope very well with stress, chooses the way of coping with stress which contradicts his possibilities of processing stimulations. Once he is externally forced (environment pressure) or internally motivated to adapt to the external conditions and to choose ineffective coping style, he may de facto decrease his tolerance to stress and decrease the effectiveness of acting [31].

The research proved that temperamental activity understood as a tendency to initiate actions with a large stimulation value, remains related to the avoidance-oriented coping style, and in particular, one of its forms defined as social contacts seeking. It is worthwhile to add that no similar tendencies were observed in other research among sportsmen [27], however, they were found in the studies of twin and flood victims [22]. In the case of sport activity, apart from correlations with avoidance-oriented coping, the only significant correlation was obtained in a group of basketball players. This correlation concerned task-oriented coping (Table 3). This could indicate that in the group of soccer players task-oriented style is preferred by the players with large possibilities of processing stimulations (low emotional reactivity, high endurance) irrespectively of the degree of adjustment of activity level to other temperament dimensions.

Conclusion and Application

The studies allowed for formulating the following conclusions:
- preferring a particular stress coping style is related to the temperament type. This correlation is the strongest in the case of temperament structure indicating limited possibilities of stimulations processing and emotions-oriented stress coping style.
- In the work with sportsmen, while working out methods of coping with stress related to sport activity, it must be remembered that:
- Effective coping depends not only on a particular type of temperament but also a preferred coping style and the choice of particular strategies and psycho-regulating techniques.
- In sport, emphasis is laid on effective coping with stress which consists in reaching particular goal, effective actions and task resolving. In such an approach, a work with a player would consist first of all on teaching sport people techniques and strategies and training particular abilities. The research proves that it is especially significant to take into consideration some individual possibilities and predispositions of a player (among others concerning their temperament). Therefore optimal coping with stress would consist not only in achieving specific effects, but also in appropriate management of the resources and appropriate selection of the resources which are renewed.
- Optimal forms of coping with stress are the ones which not only protect one's own resources against excessive exploitation, but also lead to the increase of coping potential.
- The result of an effective coping, an increase of experience is gained and the increase of coping competence.
- Activity belongs to the temperament traits which may change under the influence of extra- temperamental personality characteristics. A special role is played by motivation of achievements [31], which belongs to characteristic features of record-seeking sport players. Increased activity makes it possible to realise various standards personality, but also this is done at the cost of ineffective self-regulation. It seems therefore significant that in the work with sport players, special attention should be paid to adjustment of activity level to other temperament dimensions.

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