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XI

**PROBLEM OF STRESS  
IN SPORT PSYCHOLOGY  
RESEARCH REVIEW**

**PROBLEM STRESU W PSYCHOLOGII SPORTU  
PRZEGLĄD BADAŃ**

**ABSTRACT**

The main aim of this work is to illustrate the notion of stress in sport as well as to explain how and why stress mechanisms come into being in sport situations. The hitherto report contains both theoretical and empirical issues. The theoretical part is devoted to the explanation of stress and its relation to sport psychology. The practical one comprises of the review of works concerning the sources of stress and the moderators influencing its perception along with coping styles among various sportsmen. Attention has been drawn to the fact that sportspeople are exposed not only to stress connected with trainings and competitions but additionally to the natural stress connected with their lives. In this respect the researchers dealing with the causes that bring about stressful situations have imposed not only measures regarding training loads or trials but also school requirements, interpersonal relations, financial concerns etc. The pleaded research present a number of factors which influence the efficiency of the actions taken up in response to stress. Apart from the demographical variables (age, gender, race, nationality), factors like the impact of the advancement of contestants, their practice and their psychic functioning scheme (e.g. the way of attention directing, the type of the applied causal attribution) are also examined. Generally speaking, the analyzed works indicate the significance of individual

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and cultural differences to the perception of certain situations as stressful and to the undertaken preventive measures.

**Key words:** stress, sport psychology, research review.

## STRESZCZENIE

Zasadniczym celem tej pracy jest przybliżenie problematyki stresu w sporcie oraz wyjaśnienie, jak i dlaczego w sytuacjach sportowych mogą oddziaływać mechanizmy stresu. Prezentowane opracowanie zawiera treści teoretyczne oraz empiryczne. W części teoretycznej omówiono pojęcie stresu oraz odniesiono się do tego zagadnienia w psychologii sportu. W części analitycznej przedstawiono prace dotyczące źródeł stresu oraz moderatorów wpływających na przeżywanie stresu i radzenie sobie z nim przez sportowców różnych dyscyplin. Zwrócono uwagę na to, że sportowcy narażeni są nie tylko na stres związany z treningami i zawodami, ale dodatkowo na ten życiowy, który dotyka każdego człowieka. W związku z tym badacze zajmujący się przyczynami sytuacji stresowych podejmowali pomiary dotyczące nie tylko obciążeń treningowych lub sytuacji startowych, ale także wymagań szkolnych, relacji interpersonalnych, kwestii finansowych itp. Przytoczone prace badawcze pokazują wiele czynników, które wpływają na efektywność aktywności podejmowanych w odpowiedzi na stres. Poza zmiennymi demograficznymi (wiek, płeć, rasa, narodowość), sprawdza się także wpływ poziomu sportowego zawodników, ich stażu czy sposób funkcjonowania psychicznego (np. sposób kierowania uwagi, rodzaj stosowanej atrybucji przyczyn). Uogólniając, przeanalizowane prace wskazują na istotne znaczenie różnic indywidualnych i kulturowych na postrzeganie określonych sytuacji jako stresujących oraz na podejmowane przez nich działań zaradczych.

**Słowa kluczowe:** stres, psychologia sportu, przegląd badań.

## INTRODUCTION

One of the most important questions raised by scientists dealing with stress concerns the individual differences related to the reactions against stress. Directly speaking, why the behaviour of certain people relatively easily undergoes disorganization under the influence of stressors in contrast to those presenting greater resistance and being able to work efficiently in stressful situations.

The experienced stressors vary according to the daily activity of an individual. People involved in sport struggle with a lot of emotional difficulties regarding rivalry, training, time pressure or the life beyond sport which considerably influence the manner of perception and coping with stressful situations.

Physical activity is perceived as one of the most important aspects of lifestyle that has a positive effect on both physical and psychical wellbeing of a person. Indeed, an average person reaps benefits from regular yet moderate sport activity. However, professionals train in order to achieve a high level of mastery and not necessarily to remain in optimal health. A lot of top sportsmen overstep the marks of physical and psychical safety revealing the symptoms of

chronic tiredness, suffering from injuries and illnesses just to reach their goals. In this respect it proves extremely important for competitors to learn how to successfully cope with the number expectations built up against them. What they need is psychic discipline to focus on the realization of training aims and achievements as well as physical strength to deal with inevitable complications. Coping with stress is, therefore, an important skill which enables the increase in sport advancement. Hence the extending interest of researchers about factors that affect better scheme of dealing with everyday and sport expectations among various sportspeople (Martin, 1998).

## DEFINITION OF STRESS

Just like many other psychological terms, the notion of stress is highly ambiguous. Since 1940s it has gained widespread popularity yet the conception still lacks one commonly accepted definition. The colloquial use caused the attribution of mostly negative associations with the term. People often use it to complain about the difficulties of everyday life, describe experiences or explain certain behaviour.

The author of the concept of stress is a Canadian physiologist Hans Selye (1960). He treated stress as a state of human body. His studies on rats have led him to the conclusion that pathological changes in internal organs appearing as a response to physiological and psychological harmful stimuli (stressors) constitute a kind of non-specific defence reaction of the body. He called the identified phenomenon as stress. According to Selye, the indication of stress is the so called General Adaptation Syndrome (GAS). The syndrome consists of three phases: alarm – during which the defence forces are mobilised, resistance i.e. adaptation to work under stressful conditions as well as exhaustion by the long-lasting presence in a extreme situation.

In psychological conceptions stress was understood as an unpleasant emotional reaction mostly of panic character. Such depiction exists in common interpretation of stress as a state of tension, feeling of danger or anxiety. The majority of authors consider it unilateral and insufficient (Heszen-Niejodek, 2000; Borkowski, 2001; Terelak, 2001).

The initial stress theories defined it also as a stimulus, situation or external event of specified properties (Janis, 1958; Holmes, Rahe, 1967). This approach, however, faced critique concerning the negligence of the individual differences among people. In reply to those allegations, stress started to be defined as a human internal reaction.

Further evolution of the concept associated with taking both external and internal factors into account and, in the course of time, addition of a mediative factor which is the individual perception of a situation. Scientists began to describe stress as a result of the evaluation of interaction between the environment (its requirements imposed on a unit) and unit (its coping abilities). Such approach was considered as appropriate by i.a. Lazarus and Folkman and in Polish psychology – Reykowski (Reykowski, 1969; Lazarus, Folkman, 1984).

In Lazarus model there is a dynamic relationship between human and environment in which both sides mutually influence each other. Whenever a relation with the environment in primary appraisal is regarded as stressful it can be perceived in three ways: harm/loss (depreciation of values), danger (connected with the anticipated damages) or challenge (anticipated situations that may bring both damages and profits). The secondary appraisal is connected with the estimation of capabilities of taking up certain actions in order to remove the cause of stress or at least some methods of soothing its ravages or, in case of challenge, leading to the achievement of available profits. Both cognitive processes – primary and secondary appraisal – run simultaneously and are associated.

Hobfoll described stress in slightly different categories (1989). His idea is based on the concept of personal resources of a unit i.e. all that is significant to the survival of man or serves to achieve additional resources. Among them he mentions objects, human properties, conditions (e.g. social status) or energies (i.a. time and money). Basing on the presumption that people tend to preserve and multiply their resources the author defines stress as a human reaction to the actual or percept losing or simply not obtaining of resources.

## THE EFFECTS OF STRESS

Chronic high stress combined with insufficient coping styles may contribute to the emergence of much more serious somatic consequences. First of all they are psychosomatic illnesses such as the ulceration of stomach, duodenum and colon, coronary heart disease or hypertension. Moreover, stress considerably increases the risk of contracting diabetes, asthma, rheumatoid arthritis or various allergic ailments. The research results indicate that excessive stress may decrease the immunity against miscellaneous infections, degenerative or even cancerous diseases (Oniszczenko, 1998). Stress has also a negative impact on sexual functions of men and women (e.g. loss of sex drive), may bring about neuralgia, vertigoes, numerous neurotic ailments or mental diseases.

Generally speaking, negative influence of stress manifests itself in the form of disorders of functioning of body organs and systems as well as damages to their biological structure. Apart from the salubrious effects, stress also causes aftereffects in family and professional spheres. Aside from the individual and social consequences for a unit and its surrounding one may not omit the fact of high expenditure on dealing with the aftermaths of civilization stress of life including sport.

In this connection, it is of utmost importance to take up the notion of stress both empirically and practically. Conducting research regarding particular areas of life will allow to find its proper causes and answer the question which the successful coping methods are.

## STRESS IN SPORTS

The demands of contemporary life make stress inseparable part of human functioning since the earliest years. Specialization in sport is earlier and earlier and rivalry takes the form of organised sport since the earliest steps of young sportspeople's "careers" (Nowicki, 2005). Growing technical progress of the contestants causes such high density of results that the place or win is very often determined by a subtle and accidental mistake. The ground of these mistakes is tracked in the spheres of sportspeople's psyche, the distortions of their psychical regulation processes, concentration or stress resistance (Pałka, Rogoziński, 1987).

Nowadays, competitors obtain results of extreme character owing to which every sport achievement is tantamount to the experience of stress. Sportspeople are exposed not only to the everyday life stress but, additionally, to the one connected with trainings and competitions (Martin, 1998). They go through similar tensions as ordinary people do everyday such like financial, professional or interpersonal problems yet multiplied by the requirements imposed on them by sport. Training takes a lot of contestant's time which effects in the lack of energy and time that can be devoted to work, social activity or taking some rest. Frequent departures to training camps or competitions taking place away from the accommodation of a person may bring about financial problems and hinder the possibility of permanent and steady employment. A lot of sportspeople devote so much time to sport that they neglect their own professional development and do not achieve education which is adequate to their abilities. There also happen individuals who work very hard to simultaneously build up their sport and professional careers. However, through overloading themselves with numerous, ill-scheduled additional tasks falsely believed able to be managed, they cause intense tensions.

Top professional sportsmen and women possess financial support from sponsors. Yet, it is related to increased pressure to obtain high results aiming at effective promotion and successful representing of their benefactors.

During training sessions stress appears as a result of high physical and physiological load continued regularly despite feeling tired. Also in psychical sphere training provides subsequent burdens i.a. through constant overcoming one's pain, tiredness or fear of injury or illness that could prevent from achieving training and competitive aims. It often happens that a competitor is forced to resign from competition for which he has been preparing for the whole season because of health problems.

Stress connected with competitions manifests itself in the behaviour of the sportsmen who very often react emotionally before important events. They are irritated and nervous. There are those who must always have an argument with somebody (it can be an arbiter or trainer etc.) before their contest. Some people claim that they have a feeling of thoughts whirling in their heads with regards to the incoming competition. The most stressful concern the prediction of achieving or not achieving the desired result. For some contestants they can be aid to mobilization of physical and psychical strengths. Among others, they may cause destructive stress and even fear of the contest which can significantly lower the real abilities of a unit.

Owing to training consisting of providing the sportsmen with gradual loads, their resistance to both weak and strong stressors is being created. They start to work out the best way of functioning under extreme conditions that may be obviously carried by professional sport. By the preparation of a competitor it is meant that his resistance to discipline-specific stressors is build up. Moreover, it encompasses the development of techniques allowing control over one's behaviour in the face of stress i.e. learning effective coping styles. Successful training should lead to a situation in which burdens that among ordinary people signify *exhaustion* for sportsmen still remain in the stage of *immunity* (Selye, 1960). It generally leads to weakening the natural defence mechanisms against extreme overloads. In sport jargon such activity is described as "activating organism's reserves" (Doliński, Szmajke, 1991). A well-known cyclist Armstrong (2003) has once written that there is one thing that only sportsmen can do. The thing is to restate the limits of a man.

## SOURCES OF STRESS IN SPORT

Factors that induce stress are called stressors. They can be characterised according to their strength and range of influence (concerning either single or

a group of people), time dimension (single, periodic, cyclic or chronic stressful events) and manageability i.e. the degree to which the appearance, course and effects of stressors depend on the purpose of engaged people (Heszen-Niejodek, 2000). Within the first type stressors can be divided into:

- dramatic events of the size of catastrophes such as wars, elemental disasters that concern whole groups of people;
- serious challenges and threats that concern units or several people like the life events described by Holmes and Rahe (1967);
- minute, everyday nuisances also described as everyday life difficulties (Kanner et al. 1981, Łosiak, 2007) regarded as the weakest stressors but often harmful through their frequency and commonness (Lazarus, Folkman, 1984).

The first type are recognized as universal for causing extreme, traumatic stress regardless of human beings. The research conducted on sportspeople usually refer to the later groups of stressful factors. However, due to the fact that professional sportspeople very often go beyond the bounds of safety putting their own (and sometimes their contestants') health or life at risk with the aim of achieving championship, it is often stated that with regards to sport, stress is on extreme level.

The time of doing sport very often falls on the time of beginning tertiary education among young competitors. In this respect a sportsperson has to face new challenges resulting from sport, educational and social requirements. Passing from secondary to tertiary school is obviously stressful for average students. People engaged in sport experience even greater levels of stress as their requirements are multiplied. Wilson and Pritchard (2005) have noticed that despite the fact that some researchers point to the function of engaging in sport as defence against stress (Hudd et al., 2000, Kimball and Freysinger, 2003; Kudlacek, 1997; Shirka, 1997; Wilson, Pritchard, 2005), other research papers indicate that sport activity may be an additional stressful stimulus which is not experienced by students not engaged in sport (Kimball and Freysinger, 2003; Wilson and Pritchard, 2005; Papanikolaou et al., 2003). Training students are exposed to unique stress stimuli connected with their sport role i.e. the loss of "star" status, which many have come through in high school, injuries, the possibility of being removed from the pitch, conflicts with trainers etc. (Papanikolaou et al., 2003). Wilson and Pritchard (2005) decided to identify the sport-students specific sources of stress that vary from those experienced by students not normally dealing with sport activity. The obtained results proved some considerable differences in a range of aspects. For example, sport students raised more complaints in the areas like conflicts with their partner's (boyfriend/girlfriend) family or having too many duties which implied less time for sleep. On

the other hand, non-sport students informed about greater influence of factors such as financial demands, making important decisions that concern education, being deceived by someone (e.g. paying too much for services), falling in social conflicts regarding smoking cigarettes with roommate or friend, problems with transport, social isolation or dissatisfaction with their appearance.

The results obtained by Wilson and Pritchard (2005) only partially agree with other research concerning the analyzed topic. The earlier research proved that sportsmen reveal higher level of academic stress caused by missed classes and stronger tension connected with financial strain (Humphrey et al., 2000, at: Wilson, Pritchard, 2005; Papanikolaou et al., 2003). Wilson and Pritchard (2005) admit that the fact that their measurements were conducted in an independent school, where most attended thanks to sport subsidies, training students could worry about the financial matters to a smaller degree. In their conclusions the researchers state that a lot of first-year students engaged in sport are unprepared to effectively deal with all the stressful stimuli regarding their double role. That is why the knowledge of particular factors that bring about the increased level of stress is part and parcel of planning effective interventive and preventive programmes.

Anshel and his associates (Anshel, Sutarso, 2007; Anshel et al., 2009; Gan, Anshel, 2009; Gan et al., 2009) during long-lasting studies have been examining various aspects of the experience of stress among young sportspeople. Gan and Anshel (2009) checked what are the sources of intense stress struggled with by young contestants in professional sport. They have also been analyzing to what extent these sources depend on the abilities and gender of competitors. The studies embraced the experiences of Chinese sportspeople who continued education at college. Five general categories of stress sources have been enumerated that can be faced during competition (listed according to the intensity of their influence) i.e. oral abomination from others, misbehaviour of the referee (e.g. unfair treatment), trainer's dissatisfaction, environmental sources (such as weather) and the opponent.

Earlier research conducted on American sportsmen (Gould et al., 1983; Junge, 2000; Anshel, 2001) proved as well that violence connected with sport combined with unpleasant commentaries from the spectators which are the sources comprised by the first mentioned group are the ground of strong stress. Taking the last category of sources into consideration, Anshel and Kaissidis (1997) demonstrated through earlier analysis that American sportsmen also found this factor stressful and were afraid of it more than Australians.

Gan and Anshel (2009) have not found any differences between the answers of men and women concerning the observed sources of stress. The results, however, indicated a significant difference in observed increase in the level of stress among competitors of different advancement level. Elite sportspeople showed lower intensity of stress in comparison to their less qualified peers. The



result agreed with previous studies of Neil et al. (2004), in which highly qualified sportspeople revealed lower intensity of stressors than the weaker ones. Gan and Anshel (2009) explain this diversity as being associated with higher self-confidence and better ability to interpret the symptoms of anxiety.

Anshel et al. (2009) have analyzed race and gender alterations regarding sport-related sources of strong stress that appears during rivalry and is perceived by the competitors as intensive. The research group included Afro-Americans, White race and Latino sportspeople of both genders training in secondary and tertiary schools. Multidimensional analysis of the variations proved that white people experienced stress with higher intensity more often than in Afro-Americans. This concerned both personal and situational factors. Latinos were indifferent in comparison to the remaining group in non of the analyzed categories. Women used to describe as more intensive the sources of stress connected with their trainer.

In the aforementioned works attention has been drawn to the factors unrelated with sport that, through imposition on sport requirements, provide competitors with unique challenges. Scientists dealing with the sources of stress take measurements connected with training and competitive loads as well as school demands, interpersonal relations or even financial matters. The majority of studies involve competitors still attending to schools. It may derive from the accessibility of such people but also from the fact that sportsmen are generally mostly young people who are on the course of receiving education on different levels. The listed works ambiguously point out the influence of individual variables such as sex, the level of advancement or environmental e.g. culture, on the classification of certain situations as more or less stressful.

## COPING WITH STRESS

Contemporary psychological conceptions treat the notions of stress and coping styles inseparably. Since 1970s a growing interest is being observed in activity taken up by a unit and not in the factors causing stress. Such tendency may be explained by the fact that the effects of facing stress are more subject to the coping styles than the actual activity of stressors.

Coping with stress may be considered as a process, strategy or style (Heszen-Niejodek, 2000; Wrześniewski, 2000). The term process concerns the whole complex and dynamic activity that is taken up in face of a stressor, lasts for the time of its operation (often very long e.g. chronic illness) and is changeable under the influence of the stressful situation development. Such approach is represented by Lazarus and Folkman (1984).

Strategy is one element of the process of coping (process is a chain of strategies changing in time). Under this concept various action and reactions are defined that human being takes up in a particular stress situation (Strelau et al., 2005). They are acquired with development on the basis of general learning principles. Very often new strategies become established during the process of coping especially when they prove efficient.

The notion of coping style involves the individual tendency of dealing in a specific way. It describes respectively firm habitual human behaviour in stress situations. Subjective factors are accented here (in the stress coping process situational factors are highlighted). People have the tendency to choose the dominating style and follow it in stressful situations. However, there may happen forced situations in which applying preferable strategies can be hindered or sometimes even impossible (Heszen-Niejodek, 2000).

Over recent years stress coping in sport has become one of the most significant problems dealt with by researchers. Anshel and Si (2008) notice that the process of coping that is based on applying various strategies is dependant to individual differences in the perception of the intensity of stress. Madden, Summers and Brown (1990) studying basketball players discovered that sportspeople declaring high intensity of the experienced stress took up actions and more often searched for information and social support to deal with stressful events, in comparison to those revealing less of the experienced stress. In another research, Rawstorne et al. (2000, at Anshel and Si, 2008) stated that coping style is subject to the type of stressor (in case that a stressor is classified as highly intensive).

The results of the published research conducted on sportsmen related to the strategies of coping allow for the assumption that sportsmen engaged in various disciplines show certain specified types of strategies that steam from experiencing intensive stress during competition (Johnston and McCabe, 1993; Anshel et al., 1998). Krohne and Hindel (1988) have ascertained that the effective top table tennis players after doing a mistake, experienced considerably less anxiety and obtained better performance through the usage of avoidant coping style, and not the approach coping style. In another experiment on table tennis players, Anshel and Anderson (2002) have discovered that applying the approach coping style was connected with negative effects and lower accuracy of trials in contrast to the avoidant coping style. Roth and Cohen (1986, at Anshel and Si, 2008) describe the approach coping style as time-consuming and distractive. Thus, especially in motoric sports, more effective proves the avoidant coping style in which a contestant does not pay attention to stressful stimulus what enables them to concentrate on the action and obtaining a positive result.

On the basis of stress coping styles theory by Endler and Parker, Guskowska (2002) has studied the differences within the spread of coping styles in students

of Physical Education Academy (*Akademia Wychowania Fizycznego – AWF*) in Warsaw, Military Technical Academy (*Wojskowa Akademia Techniczna – WAT*) in Warsaw and Polish Air Force Academy (*Wyższa Szkoła Oficerska Wojsk Powietrznych – WSOWP*). The dominant coping style in students of PEA (*AWF*) was the task-related style. At the same time, considerably less frequent (with similar incidence) behaviours were chosen that are ascribed to the avoidant and emotional styles. As it comes out of earlier research, the obtained hierarchy of styles (i.e. in descending sequence from task related, through avoidant to emotional approach) is characteristic for men (Jelonkiewicz, Kosińska-Dec, 1999).

By comparing students from various types of schools it has been established that, towards, students of MTA (*WAT*) and PEA (*AWF*) much more often apply the emotional style and less frequently seek company of other people (subscale of avoidant style). In turn, comparing to students of PAFA (*WSOWP*) and PEA (*AWF*) declare definitely more frequent use of task-related style and less frequently – the avoidant style, especially in the form of commitment to substitute actions.

The author has also been checking the correlation between dealing with a difficult situation and the sense of coherence measured with SOC-29 questionnaire. Among *AWF* students it was observed that greater frequency of choosing actions aimed at solving a problem and lower concentration on emotions are related to strong sense of comprehensibility and manageability.

The results gathered by Litwic (2008) enable to describe the relationship of stress coping styles with the sense of coherence among juniors and seniors training sport shooting. The contestants declared the use of the biggest number of strategies classified by Endler and Parker as the task related style and the smallest number of those placed within the scale of emotional style by the authors of the CISS Questionnaire. Such hierarchy of coping styles existed regardless of gender. Moreover, women, as compared to men, tend to reveal considerably more behaviours proper to the style concentrated on a problem which is on the contrary to the earlier research on the relationship between gender and coping styles (Jelonkiewicz, Kosińska-Dec, 1999). For all examined competitors the high level of the sense of coherence (SOC) was related to the increased tendency to employ task-related coping style and decreased concentration on emotions. Such tendency was very clear especially among women. There also appeared a negative correlation with the avoidant style. Along with the raise of comprehensibility among women, the tendency to ignore problems dropped whereas men engaged in substitute actions to a lesser degree.

The task-related style is considered to be the most functional i.e. allowing for the most effective dealing with problems. On the other hand the emotional style, which main aim is to release the emotional tension, after long period of application may even deepen the feeling of stress or bring about the increase in

tension or depression (Endler, Parker, 1990; Jelonkiewicz, Kosińska-Dec, 1999). The desadaptative role of this style is highlighted by Szczepaniak et al. (1996) who proved that there is a strong correlation between concentrating on emotions and neuroticism. In a great deal of previous studies, the emotional coping style gave positive correlation with negative health variables such as: depression, fear, slower recuperation. Albeit the task-oriented style gave negative correlation or there was no relationship between these variables (Endler et al., 1993; Flett et al., 1996; Zwoliński, 1999). In this respect it has to be stated that the groups of sportsmen studied by Guszowska (2002) and Litwic (2008) declared the application of efficient methods of dealing with stressful situations.

In the research conducted by Anshel et al. (2009) regarding coping styles used by sportsmen of various races it turned out that white sportsmen showed much stronger tendency to employ approach-behavioural style than Afro-Americans who more often chose avoidance-cognitive style. Women more frequently comparing to men, applied the approach-behavioural and the avoidance-cognitive styles. Furthermore, studies done over Chinese, American and Australian sportsmen (Anshel et al., 1997; Anshel, 2001; Anshel, Si, 2008) indicated cultural differences in the choice of stress coping styles.

Interactions run in order to improve individual techniques of tackling stress may concern both psychological (e.g. changes in the estimation of self-competence or difficulties imposed by the task) and physiological state of body (e.g. relief from tension) aspects. The techniques that are often applied by sportsmen unite both displays of human functioning using the concept of feedback between the estimations and the measured physiological condition. In such areas researchers examine the effectiveness of the undertaken actions and factors that influence their efficacy.

One of the first studies of the effectiveness of those methods has been performed by Orlick and Partington (1988) on sportsmen competing in the Olympic games. It has been proved that the success of the top athletes was connected with particular elements of so called mental training concerning, above all, the development of emotional control skills through relaxation, imagination and simulation trainings. Relaxation exercises make use of the influence of relaxing muscles and decrease of respiratory and cardiac rhythm on the general calm and the feeling of psychic comfort. The relaxation of the muscles and mind is bound to improve the concentration skills and increase the effectiveness of cognitive processes owing to which a relaxation session becomes the basis to further skills' development during mental sport training (Nowicki, 2004). Such training is a long-term process which requires a great doze of regularity as the aim is a full automation of the practiced reactions. The research suggest (Nowicki, 1987; Markowska et al., 1989 at: Nowicki, 2004) that the first

effect may be observed already in the second week of everyday training sessions. However the time necessary to practice the desired psychic characteristics varies according to the types of methods and individual predispositions of competitors.

## **STRESS MODERATORS**

This part is devoted to the presentation of studies regarding some of the factors that can significantly modify the development of stress causing the differentiation of the course and character of stressors, stress itself together with its aftermaths and coping styles.

### **Experience and the level of the competitors**

Epstein in collaboration with Fenz (1963, 1965, 1967; Fenz, Epstein, 1962, 1967, 1968) have conducted long-term observations and examinations on parachutists. They were especially interested in how the fear dynamics of the parachutists presents and in what way do they get resistant to the stress connected with jumping. In this connection they have checked what the relationship is between the experience in jumping and their emotional involvement (Fenz, Epstein, 1967, 1968). They have been comparing the physiological arousal on the trial day and the day after. They discovered that among beginners there was a much bigger leap of GSR measure and the reaction time than among experienced contestants. Different was the dynamics of that arousal. The sooner was the jump the stronger the arousal among beginner parachutists and directly after the jump there was a sudden drop. Among experienced parachutists, however, the maximum level of activation fell on the few to dozen hours before the jump. Then it gradually lowered until it raised again after the jump. The scientists have come to a conclusion that experienced parachutists have a practiced emotional control ability owing to which they are capable of inhibiting fear reaction in the time before the jump.

### **The age**

Considering the differences of the age of competitors, Bäckman and Molander (1986, at: Molander and Bäckman, 1994) have compared Swedish mini golf players of high and average skills during trainings and competitions. The number of shots was registered as well as the pulse, anxiety indicators and

the time of concentration. Among all players, regardless of age an increased pulse was observed during competition with respect to trainings. In the groups of older (50 – 73 years old) and less talented golf players during competitions worsening of motoric performance appeared whereas among younger (15 – 35 years old) players the level of motoric performance improved. The time of remaining concentrated was also shorter among older players. The researchers have drawn a conclusion that age has an indirect influence on the ability to tame the competitive arousal. Older players are less proficient in dealing with strong stress connected with the participation in a contest because aging brings about a decrease in the level of various cognitive skills.

Professional sport may be too stressful for children whenever they feel that their value depends on their attempts. In one of American studies, LeBlanc and Dicson (1997) stated that among 62% of children taking part in competitions the fear of failure and making a mistake appeared. 23% of them announced that the experienced stress discourages them from further professional training.

There is a certain fear that the stress existing in professional sport may hinder emotional development of children. In response to those reproaches one could adduce the results of research carried out by Simon and Martens (1979) on groups of children engaged and not engaged in sport activity. No significant difference has been noticed between the results of both groups. However, some discrepancies have been reported among the participants of team and individual sports. In sports where children compete in teams lower level of anxiety has been observed. On the basis of these results the scientists have stated that despite the fact that sport obviously causes stress, it is no deeper than that experienced by the child while taking an exam or performing in a school music band.

Studies conducted at Canadian Association of Trainers request under the management of Carmichael (LeBlanc and Dickson, 1997) proved that no younger than eleven-year-old children start to effectively adapt to competitive stress. Excessive level of stress in too early age may lead to worse self-perception and may considerably hinder learning processes. Furthermore, the researcher points out that children ought to begin their professional career in specially designed environment i.e. have some, manageable deals of stress provided by the trainer with respect to individual abilities of young people.

## **Strategies sustaining self-esteem**

Stress itself influences the self-assessment of competitors. The presented researches show factors that may additionally affect the contestant's self-esteem which also means to modify their perception of stress.

With regards to Jones and Berglas suggestion (1978, at: Doliński i Szmajke, 1991) that sportspeople very often apply (self-discovered) strategy of anticipatory self-hampering for the purpose of protecting personal value, Rhodewalt and associates (1984) have carried out studies on a group of swimmers from American university teams and professional golf players. They have stated that people that reveal the tendency to anticipatory self-hampering before important events were also much more often subject to injuries, somatic and psychic illnesses than before less important ones. What is more, before important competitions these sportspeople evaluated the conditions as objectively tougher and less favouring the achievement of a good result (e.g. pointing to the difficulties of a golf pitch or the temperature of water). On the other hand among people less inclined in self-hampering such differences have not been observed. It shows that some competitors de facto use this strategy in a stressful situation in order to maintain self-assessment.

Rhodewalt and his associates (1984) have also examined whether undertaking such strategy influences the level of sport achievements. Positions on the rank list of golf players representing strong and weak tendencies towards the discussed behaviours were taken into account for the sake of the analysis. Sportsmen from the first group took slightly higher positions. Such result triggers out a presumption that anticipatory self-hampering strategy may be a successful technique of coping with a difficult situation. Nevertheless, the differentiation made by Leary and Shepperd (1986, at: Doliński and Szmajke, 1991) should not be omitted. They have divided the abovementioned strategy into two variations – behavioural and symbolic. The former is connected with the actual behaviours that cause real decline in the probability of success (e.g. non-sporty lifestyle) the latter deals only with talking about the obstacles connected with a trial (e.g. complaining about the environmental conditions). This strategy may turn out to be successful as it allows to reduce the tension related with predicting possible failure. Yet, as far as the first form is taken into consideration, it can not necessarily compensate the negative consequences of the actions that would have been undertaken. Such differentiation was not done in Rhodewalt's et al. measurements (1984).

Likewise, Karolczak-Biernacka (1986) draws attention to application of this strategy yet not mentioning the self-hampering term directly for research. She considers the perception of failures among competitors before attempts i.e. before they could actually happen as well as the defensive mechanisms that are to be the method of coping before contests. She announced that sportsmen have the feeling of frustration similar to that experienced in face of difficulty simply by imagining it. The author claims that the results of the studies carried out on a group of swimmers which indicate that the perception of personal competitive

anxiety as stronger than that of the opponent (statistically significant difference among men, insignificant among women) suggest the commonness of applying the anticipatory self-hampering strategy.

A great number of research papers confirm the impact of attribution on the experiencing of stress and effectiveness of coping methods (i.a. Scalan and Passer, 1980; Riess and Taylor, 1984; Taylor and Riess, 1989). Gaudreau and Blondin (2004) proved that disposable optimism and pessimism correlate with various coping styles, achieved goals and affective states during sport competitions. The performed analyses point out that task-oriented coping style partly mediates in the relationship between optimism and positive emotional state after the competitions. On the other hand, avoidant style fully mediates in the relationship between pessimism and anxiety mixed with despondency after the competition.

Research aimed at the comparison between people engaged and not engaged in sport reveal that in causal explanations of their results competitors more often refer to the effort devoted by themselves and much less frequently to the aleatory factors like good or bad luck (Scalan and Paser, 1980; Riess and Taylor, 1984; Taylor and Riess, 1989). Such way of thinking is evidence of the tendency to such attributions which enable to maintain a strong feeling of influence on the achievement of a result. This, however, helps in stress coping in case of predicting further attempts. With reference to sport practice it can be stated that sportsperson's complaining on having bad luck may be a signal for the trainer that he stops seeing the impact of his undertakings on the obtained results.

## **Self-focusing of attention**

The hitherto prevailing researches (Pennebaker and Lightner, 1980; Baumeistrer and Showers, 1986; Nideffer, 2001; LaCaille et al., 2004; Baghurst et al., 2004) show that the application of cognitive strategies based on lowering self-concentration of attention and moving it to external factors may improve the results in some sport disciplines. Self-concentration causes the subjective experiencing of tiredness and the passage of time. Refocusing of attention outside can bring about the increase in effectiveness of physical effort expenditure. It is especially important for endurance sportspeople such as: runners, long-distance swimmers. Padget and Hill (1989) displayed that people taking part in a mile run who had been given an instruction to pay special attention to the changing environment (e.g. counting cars or spectators) obtained much better time than people from the control group who hadn't been given the instruction.



They have also carried out an experiment during which the tested people who were riding an exercise were divided into two groups. Those, whose task was to concentrate on their internal states (the movements of muscles, cardiac action and cutaneous impressions) and those who had to fill in a questionnaire about their bodies states. In spite of both groups being induced to think about their bodies, people whose attention was not focused on filling the questionnaire experienced subjectively greater exhaustion and overestimated the time of the trial (Padgett and Hill, 1989).

## SUMMARY AND CONCLUSIONS

The principal aim of the present work has been to approximate the concept of stress in sport as well as to explain by what means and for what reason may various stress mechanisms appear during sporting events. Stress among sportspeople touches various areas of functioning. The competitors are exposed not only to stress connected with trainings and competitions but also the stress of life that ordinary people come across everyday. For this reason the review also contains works not particularly related to participation in sport rivalry.

To recapitulate it may be stated that the analyzed research papers indicate the significance of cultural and individual differences (i.e. gender, the level of a contestant) to the perception of particular situations as stressful and to the undertaken counter-measures. Noticeable is the great diversity of results according to sport discipline on which the studies have been carried out. This would suggest further, more detailed analysis of research concerning particular disciplines individually which could enable a discovery of regularities in the experience and coping with stress. It is, therefore, especially significant with regards to the fact that extensive knowledge of actual factors causing the increased level of stress is necessary for planning effective intervention and preventive programmes.

Another problem concerns the research models used in the abovementioned works. The majority of studies are atheoretical. The analyses are based on the strength of the existing correlations. It is, however, well known that in science the answers should only be obtained through experimental research. The sport activity allows for the examination of the results of "natural experiment" which is every single attempt in competitions. Providing that researches are conducted according to theoretical models and include a satisfactory number of variables the phenomenon of stress in sport may be better understood in the future.

## REFERENCES

- Anshel M. H. (2001). Cognitive appraisals and coping strategies following acute stress among skilled competitive male and female child athletes. *Journal of Sport Behavior*, 24, 128-146.
- Anshel M. H., Anderson D. I. (2002). Coping with acute stress in sport: Linking athletes' coping style, coping strategies, affect, and motor performance. *Anxiety, Stress and Coping: An International Journal*, 15, 193-209.
- Anshel M. H., Kaissidis A. N. (1997). Coping style and situational appraisals as predictors of coping strategies following stressful events in sport as a function of gender and skill level. *British Journal of Psychology*, 88, 263-276.
- Anshel M. H., Porter A., Quek J.J. (1998). Coping with acute stress in sport as a function of gender: An exploratory study. *Journal of Sport Behavior*, 21, 363-376.
- Anshel M. H., Si G. (2008). Coping styles following acute stress in sport among elite Chinese athletes: a test of trait and transactional coping theories. *Journal of Sport Behavior*, 31, 1, 3-21.
- Anshel M. H., Sutarso T. (2007). Relationships between sources of acute stress and athletes' coping style in competitive sport as a function of gender. *Psychology of Sport and Exercise*, 8, 1-24.
- Anshel M. H., Sutarso T., Jubenville C. (2009). Racial and Gender Differences on Sources of Acute Stress and Coping Style Among Competitive Athletes. *The Journal of Social Psychology*, 149, 2, 159-177.
- Armstrong L. (2003). *Mój powrót do życia*. (It's not about the bike: my journey back to life). Warszawa: Studio Emka.
- Bäckman L., Molander B. (1986). Effects of adult age and level of skill on the ability to cope with high-stress conditions in a precision sport. *Psychology and Aging*. 1(4), 334-336.
- Baghurst T., Thierry G., Holder T. (2004). Evidence for a Relationship Between Attentional Styles and Effective Cognitive Strategies During Performance. *Athletic Insight – The Online Journal of Sport Psychology*. 6, 1, 36-51, <http://www.athleticinsight.com/>, data uzyskania: 30.12.2009.
- Baumeister R. F., Showers C.J. (1986). A review of paradoxical performance effects: Choking under pressure in sports and mental tests. *European Journal of Social Psychology*, 16, 361-383.
- Borkowski J. (2001). *Radzenie sobie ze stresem a poczucie tożsamości*. (Coping with stress and identity). Warszawa: Dom Wydawniczy Elipsa.
- Doliński D., Szmajke A. (1991). Psychologiczne reakcje na sytuację startową. (Psychological responses to a situation of start). [w:] T. Tyszka (red.) *Psychologia sportu*. (Sport psychology). (s. 113-152). Warszawa: AWF.
- Endler N. S., Parker J.D.A. (1990). Multidimensional Assessment of Coping: A Critical Evaluation. *Journal of Personality and Social Psychology*, 58 (5), 844-854.

- Endler N. S., Parker J. D., Butcher J. N. (1993). A factor analytic study of coping styles and the MMPI-2 content scales. *Journal of Clinical Psychology*, 49, 523-527.
- Epstein S., Fenz W. D. (1963). Steepness of approach and avoidance gradients in humans as a function of experience. *Journal of Experimental Psychology*, 70, 1-12.
- Epstein S., Fenz W. D. (1965). Theory and experiment on the measurement of approach-avoidance conflict. *Journal of Abnormal and Social Psychology*, 64, 97-112.
- Epstein S., Fenz W. (1967). The detection of areas of stress through variations in perceptual threshold and physiological arousal. *Journal of Experimental Research in Personality*, 2, 191-199.
- Fenz W. D., Epstein S. (1962). The measurement of approach-avoidance conflict by a stimulus dimension in a test of thematic apperception. *Journal of Personality*, 30, 613-632.
- Fenz W., Epstein S. (1967). Gradients of physiological arousal of experienced and novice parachutists as a function of an approaching jump. *Psychosomatic Medicine*, 29, 33-51.
- Fenz W., Epstein S. (1968). Specific and General Inhibitory Reactions Associated with Mastery of Stress. *Journal of Experimental Psychology*, 77(1), 52-56.
- Flett G. L., Blankstein K. R., Obertynskic M. (1996). Affect intensity, coping styles, mood regulation expectancies and depressive symptoms. *Personality and Individual Differences*, 20, 2, 221-228
- Gan Q., Anshel M. H. (2009). Sources of Acute Stress Among Chinese College Athletes as a Function of Gender and Skill Level. *Journal of Sport Behavior*, 32, 1-16
- Gan Q., Anshel M. H., Kim J. (2009). Sources and cognitive appraisals of acute stress as predictors of coping style among male and female Chinese athletes. *International Journal of Sport and Exercise Psychology*, 40, 110-130.
- Gaudreau P., Blondin J. P. (2004). Differential Associations of Dispositional Optimism and Pessimism With Coping, Goal Attainment, and Emotional Adjustment During Sport Competition. *International Journal of Stress Management*. 11, 3, 245-269.
- Gould D., Hom T., Spreeman J. (1983). Sources of stress in junior elite wrestlers. *Journal of Sport Psychology*, 5, 159-171.
- Heszen-Niejodek I. (2000). Teoria stresu psychologicznego i radzenia sobie. (Psychological theory of stress and coping). [w:] J. Strelau (red.) *Psychologia. Podręcznik akademicki*, (Psychology. Academic handbook). Tom 3. (s. 465-492). Gdańsk: GWP.
- Hobfoll S. (1989). Conservation of resources: A new attempt of conceptualizing stress. *American Psychologist*, 44, 187-197.
- Holmes T. H., Rahe R. H. (1967). The Social Readjustment Scale. *Journal of Psychosomatic Research*, 14, 121-132.
- Guszkowska M. (2002). Style radzenia sobie ze stresem i poczucie koherencji jako czynniki warunkujące odporność na stres studentów. (Styles of coping with stress and sense of coherence as factors determining stress resiliency in students). *Roczniki Naukowe*. Warszawa: AWF, 41, 65-74.

- Janis I. L. (1958). *Psychological stress: Psychoanalytic and behavioral studies of surgical patients*. New York: Wiley.
- Jelonkiewicz I., Kosińska-Dec K. (1999). On relation between the sense of coherence (SOC) and doping styles in senior adolescents. *Polish Psychological Bulletin*, 30, 4, 281-290.
- Johnston B., McCabe M.P. (1993). Cognitive strategies for coping with stress in a simulated golfing task. *International Journal of Sport Psychology*, 24, 30-48.
- Junge A. (2000). The influence of psychological factors on sports injuries. *The American Journal of Sports Medicine*, 28, 10-15.
- Karolczak-Biernacka B. (1986). *Studia nad zachowaniem się sportowca w sytuacji trudnej*. (Studies on athlete's behaviour in a difficult situation). Warszawa: Wydawnictwo Sport i Turystyka.
- Krohne H. W., Hindel C. (1988). Trait anxiety, state anxiety, and coping behavior as predictors of athletic performance. *Anxiety Research*, 1, 225-234.
- LaCaille R. A., Masters K.S., Heath E.M. (2004). Effects of cognitive strategy and exercise setting on running performance, perceived exertion, affect, and satisfaction. *Psychology of Sport and Exercise*, 5, 4, 461-476.
- Lazarus R. S., Folkman S. (1984). *Stress, appraisal, and coping*. New York: Springer Verlag.
- LeBlanc J., Dickson L. (1997). *Straight Talk about Children and Sport*. Ottawa: Coaching Association of Canada.
- Litwic K. (2008). *Poczucie koherencji a style radzenia sobie ze stresem u strzelców sportowych*. (Sense of coherence and styles of coping with stress in sport shooters). Bydgoszcz: niepublikowana praca magisterska.
- Łosiak W. (2007). *Natura stresu. Spojrzenie z perspektywy ewolucyjnej*. (The nature of stress. A look from evolutionary perspective). Kraków: UJ.
- Madden C. C., Summers J. J., Brown D. F. (1990). The influence of perceived stress on coping with competitive basketball. *International Journal of Sport Psychology*, 21, 21-35.
- Martin C. (1998). Radzenie sobie ze stresem. (Coping with stress). [w:] T. Morris, J. Summers (red.) *Psychologia sportu. Strategie i techniki*. (Sport psychology. Strategies and techniques). (s. 77-94). Warszawa: COS.
- Molander, B. i Bäckman, L. (1994). Attention and performance in miniature golf across the life span. *Journal of Gerontology: Psychological Sciences*, 49, 35-41.
- Neil R., Mellalieu S. D., Hanton S. (2004). Competitive anxiety and coping responses as a function of competitive status and experience. *Journal of Sports Sciences*, 22, 309-310.
- Nideffer R.M. (2001). Theory of Attentional and Personal Style vs. Test of. Attentional and Interpersonal Style (TAIS). <http://www.taisdata.com/articles/tais.pdf>, data uzyskania: 30.12.2009.
- Nowicki D. (1987). Efekty technik relaksacyjnych stosowanych w treningu zawodników taekwondo. (Effects of relaxation techniques used in a training of taekwondo competitors). *Sport Wyczynowy*, 1, 33-37.

- Nowicki D. (2004). Poprzez psychologiczny trening do mistrzostwa. (Thanks psychological training to mastery). [w:] M. Krawczyński, D. Nowicki (red.) *Psychologia sportu dzieci i młodzieży*. (Sport psychology of children and youth). (s. 117-144). Warszawa: COS.
- Nowicki D. (2005). Praktyka ćwiczeń psychologicznych w rutynie treningu strzeleckiego. (The practice of psychological exercises in a routine of shooters' training). [w:] K. Kurzawski, (red.) *Strzelectwo sportowe. Nowoczesne rozwiązania szkoleniowe. Zeszyt 2* (Sport shooting. Modern training solutions). (s. 7-20). Wrocław: AWF.
- Oniszczenko W. (1998). *Stres to brzmi groźnie*. (Stress sounds dangerously). Warszawa: Wydawnictwo „Żak”.
- Orlick T., Partington J. (1988). Mental links to excellence. *The Sport Psychologist*, 2, 2, 105-130.
- Padgett V. R., Hill A. K. (1989). Maximizing Athletic Performance in Endurance Events: A Comparison of Cognitive Strategies. *Journal of Applied Social Psychology*, 19 (4), 331-340.
- Pałka M. i Rogoziński A. (1987). Czynności oddechowe podczas strzelania z pistoletu dowolnego. (Breathing activities during shooting with the use of a sport pistol handgun). *Sport Wyczynowy*, 1, 12-14.
- Papanikolaou Z., Nikolaidis D., Patsiaouras A. i Alexopoulos P. (2003). The freshman experience: High stress-low grades. *Athletic Insight: The On-line Journal of Sport Psychology*, 5, 4, <http://www.athleticinsight.com/>, data uzyskania: 20.12.2009.
- Pennebaker J. W., Lightner J. M. (1980). Competition of internal and external information in an exercise setting. *Journal of Personality and Social Psychology*, 39, 165-174.
- Reykowski J. (1966). *Funkcjonowanie osobowości w warunkach stresu psychologicznego*. (Functioning of personality in conditions of psychological stress). Warszawa: PWN.
- Rhodewalt F., Saltzman A. T., Wittmer J. (1984). Self-handicapping among competitive athletes: The role of practice in self-esteem protection. *Basic and Applied Social Psychology*, 5, 197-209.
- Riess M., Taylor J. (1984). Ego-involvement and attributions for success and failure in a field setting. *Personality and Social Psychology Bulletin*, 10, 536-543.
- Scanlan T. K., Passer M. W. (1980) Attributional responses of young female athletes after winning, tying, and losing. *Research Quarterly for Exercise and Sport (RQES)*, 51, 4, 675-684.
- Selye H. (1960). *Stres życia*. (Stress without distress), Warszawa: PWN.
- Simon J., Martens R. (1979). Children's Anxiety in Sport and Nonsport Evaluative Activities. *Journal of Sport and Exercise Psychology*, 1(2), 160-169.
- Strelau J., Jaworowska A., Wrześniewski K. i Szczepaniak P. (2005). *Kwestionariusz Radzenia Sobie w Sytuacjach Stresowych CISS. Podręcznik*. (Questionnaire of coping in stress situations. CISS. A manual). Warszawa: Pracownia Testów Psychologicznych Polskiego Towarzystwa Psychologicznego.

- Szczepaniak P., Strelau J., Wrześniewski K. (1996). Diagnoza stylów radzenia sobie ze stresem za pomocą polskiej wersji kwestionariusza CISS Endlera i Parkera. (Diagnosis of styles of coping with stress with the use of Polish version of Enderler Parker questionnaire CISS). *Przegląd Psychologiczny*, 39, 1, 187-210.
- Taylor J., Riess M. (1989). A field experiment of "self-serving" attributions to valenced causal factors. *Personality and Social Psychology Bulletin*, 15, 337-348.
- Terelak J. (2001). *Psychologia stresu*. (Psychology of stress). Bydgoszcz: Oficyna Wydawnicza Branta.
- Wilson G., Pritchard M. (2005). Comparing Sources of Stress in College Student Athletes and Non-Athletes. *Athletic Insight: The Online Journal of Sport Psychology*. 7, 1, 1-8, <http://www.athleticinsight.com/>, data uzyskania: 20.12.2009.
- Wrześniewski K. (2000). Style a strategie radzenia sobie ze stresem. Problemy pomiaru. (Styles and strategies of coping with stress. Problems of measurement). [w:] I. Heszen-Niejodek, Z. Ratajczak (red.) *Człowiek w sytuacji stresu. Problemy teoretyczne i metodologiczne*. (A man in a stress situation. Theoretical and methodological problems). (s. 44-64). Katowice: Wyd. Uniwersytetu Śląskiego.
- Zwoliński M. (1999). Sense of coherence (SOC) and coping styles as predictors of subjective health. *Polish Psychological Bulletin*. 30, 4, 291-302.