THE IMPORTANCE OF COORDINATIVE ABILITIES IN ACHIEVING ATHLETIC PERFORMANCE

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Abstract

During the training process, the development of coordinative abilities represents a priority from the first stage of training. Coordinative abilities, as well as speed, are genetically determined; therefore the possibility of improving them is lower for athletes who do not have these innate abilities. Training coordinative abilities at the proper time is crucial in what concerns future development capacity. Developing coordinative abilities to a higher level influences learning and perfecting new motor acts and their stability over time, promotes an efficient execution of motor acts and actions, in various conditions, supports better use of the other conditional abilities, encourages restructuring movements in high performance training phases and improving basic and applied motor skills.

Keywords: coordinative abilities, methods, means, performance

The approached problematic

Coordinative abilities also known as: skill, dexterity and deftness are determined by the guidance and control processes of gestures. (Frey, 1977).

After A. Dragnea and A. Bota, the term „skill”, used by many authors in the literature, seems restrictive compared to the richness (complexity) that characterizes the manifestation of these abilities. The same authors define coordinative abilities as following: „a complex of mainly psychometric qualities which implies the ability to quickly learn new moves, to rapidly and efficiently adapt to different conditions, specific to various types of activities, by restructuring the existing physical fundament”.

Coordination capacity can be defined as a psychometric quality, which is based on the correlation between the central nervous system and skeletal muscles while performing the movement.

Coordinative abilities are presented in the following forms:

General coordination – a complex form of expressing performance capacity by rapidly learning new movements and by quickly adapting to different situations according to the specificity of each branch of sport. It has several components:
- spatial orientation ability
- balance ability
- ability to make a static-dynamic, visual and acoustic analysis

Segmental coordination (special) has the following components:
- speed of execution – coordinated in the game;
- repetition speed – coordinated in the game;
- speed of anticipation – coordinated in the game;
- ambidexterity.

The relationship between coordinative abilities and other conditional abilities is unquestionable because for any action that is intended to be prompt, adequate and efficient, what you need first is speed, strength, in order to impose it and defeat the opposed resistance, especially in the critical moments of the contest which usually occur at the end of it. And viceversa, these are not effective in athletic performance unless they are used together with
conditional abilities. But of all abilities, the coordinative ones are indestructibly related to technical and tactical training, the source of perfecting these abilities being represented by the multitude of skills achieved.

Sports competitions (volleyball) are characterized by an increased speed of execution and reaction as well, which requires faster training effort of the requested segments and of the entirely body, and the increase of explosive force as well. The complexity and the variety of technical and tactical actions increases, leading to: shorter pauses between phases of the game, increased effort intensity and reduced recovery time. The metabolic substrate of the effort is particularly the anaerobic one, alternated for short periods of time with the aerobic one.

The nervous system and the analyzers (visual, kinesthetic, auditory) are highly stressed. Mental tension is also increased, which leads to the emergence of nervous tiredness, in addition to the physical one, accompanied by disturbances in the mechanisms that regulate the automatism and the accuracy of movements, as well as the decrease of the power of concentration.

The musculoskeletal system is permanently requested both at the level of the lower body and at the level of the upper one. The level of cardiovascular system stress is medium, except the phases with effort characterized by submaximal intensity. The respiratory system is very stressed throughout the game; during the played phases of the game, the body can contract a very high oxygen debt.

The factors which condition coordinative abilities can be: biological, motor and mental.

a) biological factors:
- the speed of transmitting nerve impulses along the efferent and afferent pathways and the mobility of the fundamental cortical processes (excitation and inhibition). These characteristics allow the cortex to integrate the activity of motor analyzers by selecting the multiple information received through the sense of sight, hearing, muscular sense, sense of balance etc., in order to retain those that are significant so that they can develop appropriate responses, contraction and relaxation impulses, limited in time and space.
- the value of energy sources existing in the organism.

The biological substantiation of the coordinative abilities is still insufficient compared to the other conditional abilities. The plasticity and the mobility of fundamental nervous processes together with higher nervous activity have an important role in highlighting coordinative abilities due to their power of processing information (auditory, optical, kinesthetic, tactile and vestibular signals). Cortico-subcortical relationships together with the coordination level of muscle contractions and the use of mental schemes represent the psychophysiological synoptic picture that highlights the mechanism of coordinative ability.

There are few data that allow us to know how the so-called sense of movement is forming through trainings, being specific to coordinative ability in so varied conditions: sense of the ball, basket, balance etc.

b) motor factors:
- the level of conditional and intermediate abilities development (speed, strength, endurance, mobility and combinations of them); each of these abilities involving issues of coordination, smooth adjustments of the fundamental nervous processes, integration of functions and activities of the body, depending on the requirements of motor activity carried
- the number and the complexity of motor skills mastered by the athlete.
c) psychological factors:
- ability to anticipate of deployment motion;
- ability to anticipate the future evolution of conditions in which the movement is executed (form of reflex or response stereotyped learned or automated movements);
- quality of cognitive processes (perceptions, representations) memory (short and long), thinking, convergent and divergent, especially creative thinking.

Selection of information, analysis and comparison of situations, developing situations, develop possible solutions and assumptions in connection with the issuance of the solution to be adopted, are processes engaged in activity of thinking.

**Practical applications**

When developing coordinative capacity development methodology must be taken into account the stages of growth and development of the body.

At one point some components of coordinative presents an optimum capacity development, while others are virtually undeveloped. Periods most favorable for the development of these capabilities are childhood, puberty and adolescence, when the body has a greater adaptability than adults.

Between 3-6 years will insist on the appropriation of a large number of simple motor skills.

The first school age (6/7 to 10 years) may be considered as the age of intensive development. At this age it improves the ability to react, high frequency capability gesture, the spatial differentiation and coordination under time pressure. Processes of motor learning and simple gesture skill acquisition will be conducted all at this age. Should be avoided excitations simultaneously coordinating sequences, those that require more effort, the illogical or peripherals. Emphasis will be on improving segmental coordination capacity, accuracy and spatial-temporal orientation.

In his book, „Coordinative capabilities in professional sports”, Gagea A. (2002) considers that development coordination training topics must be specifically designed for this purpose. „By repeating controlled movement approaches as increasingly more of that which, conventionally called motion well controlled. In fact it is continuing phenomenon of learning by stereotype”. The improvement of coordination is very limited and while individual because the same volume progresses individuals differently and does not increase the volume increases of coordination.

Reaching cerebral maturity that occurs at the second school age allows a cooperation of involuntary and voluntary motor function. This phase represents the largest motor learning capacity due to an improvement in the ability to combine driving directions and responsiveness and rhythm. In the field of sports training practice these skills must be first.

During puberty occurs second morphological transformation process is accompanied by an increase in height of 8-10 cm per year. The increase will harm the extremities, more or less, the training of coordinative capacity (depending on individual characteristics). At this age there is a decrease in segmental coordination capacity, especially for complex movements.

Adolescence is a period in which motor learning ability is better (higher in boys than in girls). At this stage there is a general stabilization of gestural behavior, capacity improvement driving directions, adapting and combining rehabilitation. It allowed coordinative training capacity without restriction in any discipline.
Training timely coordinative capabilities that which is decisive for the later development capacity.

In the training process, acquired coordinative capacity increased weight with the expansion of the early training of young people in all branches of sport, and is still in the first stage of training a priority.

All A. Gagea deemed binding sets used methods and coordinative capacity following attributes:
- adequate, accurate diagnosis assuming this coordinative capacity level over which is to act. It is recommended that training in which one approaches the speed issue to be addressed that issue and coordinative abilities;
- to be strictly dose, taking into account the capacity coordinative achieved, the age, the driving experience, etc.;
- work associated in the process of sports training;
- to ensure a proper sequence using these means in the training program to be appropriate to the objective and the pace of progress of the athlete.

Conclusions
Based on the detailed study of literature in the field, to experts is that the main method is coordinative capacity building exercise.

In the coordinative capacity development must take into account the following requirements:
- high degree of difficulty, requiring a high level athlete overall and segmental coordination, balance, spontaneity and creativity as the subject is common and easily executed with one exercise, will increase its difficulty, increasing accuracy requirements to motion to full coordination of movement and spontaneity of its components and to change the situation;
- should avoid exercises that cause twitching subjects;
- exercises used for coordinative capacity to apply and better use of other motor skills;
- recommended for Development of these capabilities using applicative paths, pieces of advice and competitions;
- coordinative capacity at the beginning of the lesson must be scheduled workout after a good heat, the body is prepared for peccary efforts associated with this objective;
- the workload for each training session will be small, however it will schedule a number of lessons including development objectives of the various components of coordinative capacities;
- ensuring pauses long enough to allow full recovery of exercise capacity (optimal intervals).

Proposals
In the training, coaches should know the most favorable periods when the body has an adaptability or Large coordinative development of these skills.

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