



GENERAL ASPECTS OF CONDITIONAL MOTRIC CAPACITY- FORCE

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Abstract

The purpose of this paper is to make a complete and systematic presentation of the overall aspects of conditional motric capacity - the force, considering how important is for achieving sports performance of any level. We approached classification and division criteria, determinants, evolution at different ages, and force development methodology.

Keywords: *motric capacity, force, conditional capacities, classification criteria*

JEL classification: *I12, I19, I20*

Introduction

Motric capacity is a complex of predominantly motoric manifestations (skills and abilities), conditioned by the level of motor development, morpho-functional indices, psychological processes (cognitive, affective, motivational) and metabolic biochemical processes, all summed up, correlated and reciprocally conditioned, resulting in efficient actions and actions required by the specific conditions in which motor activities are practiced. (A. Dragnea, 1984).[1]

Structure of motor capacity after M. Ardelean-Roman, 1996: (speed, strength, strength); coordination skills (skill); complementary capacities (flexibility); conditional motor capacity - force. [2]

Force is the motric capacity that allows man to overcome internal or external resistance through muscle contraction. Muscle strength is one of the most important driving capacities frequently required in motor activity. There is no movement that can be done without force. In their absence, the possibilities of acquiring motor skills are virtually non-existent.

A scheme of the different forms of expression of force is as follows:

The classification criteria are:

a) after the muscular mass involved: - general force, specific force. These two forms of force must be developed especially within the physical education lessons. For general strength, physical education lessons in the classroom, and for the specific and sports training lessons, according to the specificity of each sport branch.

b) after the character of muscle contraction: static force dynamic / isotonic force, mixed force;

c) after the effort capacity in relation to the individual human power: the

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maximum or absolute force, the relative force.

d) by mode of combining with the other driving capacities: speed in force, skill in the hand, strength in resistance mode.

R. Thomas and his collaborators in the „Driving Skills" classify the force and according to the different phases of its production:[3]

- the starting force is to increase the intensity of the contraction even in the initial phase of the force and results in a high initial speed;
- explosive force which is characterized by the speed of force increase due in particular to the speed of shrinkage of the fast fibers;
- maximum force expressed by the maximum ability of the athlete to produce a voluntary contraction against unstoppable resistance. It is set statically.

Also R. Thomas and his collaborators in the cited paper classify force according to the types of movement in:

- concentric force that is manifested inside the shrink segment;
- eccentric force that occurs outside the shrinkage segment;
- pliometric force manifested by the activity of cessation of antagonistic muscle groups.

Determinants of force are divided, for didactic purposes, into two categories:

- a) central factors;
- b) peripheral factors.

Central factors include:

- the activity of the nerve courts involved in the elaboration of voluntary or involuntary orders;
- the stimuli, which have reached the sensitiv-sensorial system, are transformed into sensations;
- muscular coordination capacity, intermuscular coordination, muscle tone regulation.

Peripheral factors influence, in particular, the maximum force but in a different proportion to the other forms of force. These factors are: the diameter of the muscle; muscular hypertrophy; the amount of energy resources, the volume of the muscle; muscle structure: length of muscle fibers and angle of action.

In the specialized literature there are too little data found about the body composition and the constitution characteristics of children and non-athlete teens. The one who did studies in this domain was Thorland. He showed that in these activities that require big release of force (weight throwing, jumping, gymnastics and combat), older athletes are defined by a smaller body mass, which is in tandem with the observed tendency of teen performers to show a dominant mezomorphic tendency than their junior colleagues.

Thorland (1984) came to these conclusions following some research done on important groups of athletes and non-athletes. Their girth, weight, muscle mass and fat were studied.[4]



For achieving amazing performances there are a series of specific factors, unique for each sport; those determine some structural and functional profiles; a better knowledge of the way these factors work determine a better efficiency of sportives selection. After getting the elite performers profile, these are compared to the less gifted individuals, only to clarify the requirements and variables necessary to reach the top of the sports pyramid.

Force indexes – the force of the tested subject is examined with dynamometrics with the body mass of the subject. The most used formula is the one which the dynamometric force from the body mass is calculated in percentage.

Force indexes: Dinamometric force X 100/Body mass

The force indexes of the fingers flexor's (the average of both hands) reaches 50-60% on untrained men and 40-50% on untrained women. The scapular force has values of approximately 50% on men and 35% on women. The lombar force is 180% on men and 150% on women. The calculation of the force indexes allows for a better interpretation of the antropometric data and more precise indications for training.

As for the force, the most pronounced hereditary grade is manifested in the force of the hands and the force of the back muscles, and the lowest for the explosive force (based on the throwing disk and ball test). The conclusions of other studies say that the most powerful genetic trait is manifested in the force of hands, in the reaction speed, low distance speed. Hereditary indexes of the dynamometric measurements of the right hand and left hand' force rose from 61.4% and 59.2%, the indexes of the back force were of 64.3%.

The explosive force in the case of jumping with the falce is very dependent of genetics, unlike the explosive force of the members, measured of the distance from the throwing of the ball or the disk show a low degree of hereditary. These results, obtained from the research on twins still need the confirmation of other methods.

To have a visible muscular progress, it needs to be stimulated on an intense scale and enough for all the muscle groups working, but at the same time there must be a rest period for these groups, from alternating the activity of the said muscle groups, with the rest from sets and the number of reps. For this there would be there would be respected following considerations:

a) The minimum time required for each muscle group and the alternating of effort:

- 1-2 times a week for preparing the muscle;
- 2-3 times a week for contraction force improvement and the volume of effort for the sport training;
- the rest time which should be 24 hours for the muscle groups that were affected during the training;



- during the training it is recommended alternation of the effort to different muscle groups belonging to legs, back and other muscular segments which need working.

b) The training must be intense and the volume of work well determined:

- the weights must be configured based on what we want. When the sets are long, the weights should be lighter, and the number of reps to not surpass 10-14 strokes, once surpassed the number of reps the efficiency is decreased and at the same time it is tiring. This type of training helps with the increase in "muscle endurance", pressuring less muscle fibers, risking to lose muscle density, execution speed and even muscle elasticity;

- the amount of effort must be in accordance with the quality of muscle preparation, individual;

- traits and the requirements of the performed activity (muscle preservation, performance sport);

- each muscle group must be stressed for at least 7-14 reps.

c) Progress in muscle force preparation.

A major importance for improving muscle force has a progressive increase of weights, number of reps, according to the level of preparation.

It is also advisable to start with at least 60% of the individual's maximum working capacity with a 5-series algorithm of 7 to 10 repetitions. Here's an example of a typical pattern of progressive increase in load in the training of muscular strength of sports performance. This training, on the progress of muscle strength, requires enough muscle to increase the qualitative and quantitative increase in its function. It is not interesting to increase the number of series and the number of repetitions, because the muscle is already tired, the appearance of contracts and muscle curves are not indicated in this type of training.

Also, restoration and recovery will be done in a time determined by a specific algorithm. Therefore, after an adaptation period of 2 to 4 weeks, it is advisable to gradually increase the number of series and the load between 80 - 95% of the maximum capacity.

Conclusions

Force can be developed /educated at any age, but especially after puberty, because by exaggeration or ignorance it can have negative effects on the growth of the body. Strength development tools (exercises) are chosen according to the type of force to be developed, the possibilities and deficiencies of the performer, the training period and midcycle. The optimal working depth of a muscle is 80-120 (the angle between segments) and the optimum working length is about 80-90% relative to the length of the muscle at rest. It is necessary to know the angles of movements in which the force is lower and to act with the amplitudes corresponding to its development.



Apart from age and gender, we mention endogenous factors such as type of motor experience, constitutional type (athletic type will develop a force greater than a type of asthenia), the way in which biochemical processes are carried out, the type of muscle fibers (type II comprises Fast twitch, fast shrinkage - split into fast white fibers, also called Type II A, weakly vascularized, but with high contraction power, but short-lasting, specific to anaerobic work, as well as fast, white vascularized fibers Type II B, which contracts strongly for a longer period of time, which allows work both in anaerobic and aerobic mode, and intermediate type II C fibers characteristic of working under different regimes are also described.

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