

# Detente and Power - Conceptual Determination, Forms and Means of Education at the Preteen Age

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**Abstract**—The scientific perspective, the practice area of physical education and sports activities improve power capacity in all its forms of expression, being a generator of the research topics. Today theories that strength training athletes and slow down development progress will affect the strength and flexibility are discredited. On the other hand there are sectors and / or samples whose results are sports of the way higher manifestation of power as a result of the composition of the force and velocity, being based in this respect on the systematic and continuous development of both bio-motric capacities said.

Training of force for children was and is controversial. Teama de accidentări sau a stopării premature a procesului de creștere a făcut ca în trecut copiii să fie ținuti departe de lucrul cu diferite greutăți. Fear of injury or premature stop the growth process in the past made the children to be kept away from working with different weights. Recent studies have shown that the risk of accidents is relatively small and the strength training can help prevent them. For example, most accidents occur at the level of athletics ligaments and tendons. From this point of view, it can be said that a progressive intervention of force training, optimal design, will help enhancing their process, such as athlete much better prepared to meet training requests and competitions. Preparation of force provides a solid basis for further phases in the highest performance.

**Keywords**—detente, education, effort will, power.

## I. INTRODUCTION

**C**HARACTERISTICS of locomotors triple chains extensions, detente results, observed immediately detach from the body supporting surface either horizontally or vertically. In other words, this attribute must be understood as an effect that can be measured by a dimensionless quantity that expresses how many times greater than the useful energy, the detachment said, compared with that consumed by specific muscle contraction momentum. However success is not assured without understanding and inclusion principles and requirements of biomechanical and physical nature of the specific training and their inclusion in the training program [3]. From this perspective detente is the result of eccentric contractions followed by a concentric, conversion recognized in the literature as the amortization phase, which may be educated or trained to produce in as short a time, training actually changing reaction force in terms of continuing the

muscle contraction (approximate) reaction time, muscle tensioning reflux. Shorter time stretching or elongation of a muscle leads to registration of senior indices show concentric strength expressed by a strong movement should prevail own body weight or inertia of an external object. Document is a template for *Word (doc)* versions. If you are reading a paper version of this document, so you can use it to prepare your manuscript.

Detente is an expression of muscle elasticity. From this perspective, approaches the muscle elasticity can be divided generally into two categories: a) increase the maximum work in a concentric contraction, performed by a previously stretched muscle, b) mechanical efficiency in an effort under - maximum alternating concentric with the eccentric contraction. Elastic deformation a force contrary to its meaning, the action is other than the conversion of chemical energy in a mechanical one.

Power is the ability of the neuromuscular system to produce the greatest force possible in the shortest time possible. Any increase in power is the result of improvements in either speed or strength, or a combination of both. Browse a distance in the shortest possible time is the effect of the event power, the result of rapid and vigorous contraction of skeletal muscle, manifested in the ability to accelerate, gesture and high repetition. On the terminology and experience in the field expressions explosive force, detente and rapid force may be synonymous with the force-velocity, the latter expressing the capacity that has a neuromuscular system to overcome resistance with the highest speed of contraction possible.

A comprehensive point of view, the use of the term of imprisonment and its definition [6], which decrease the duration of analyzing the possibilities of stroke samples athletic jumps argued that „the rate of stroke depends on the state of the central nervous system, the effort of will, strength and elasticity of muscles, the correct execution of movements. Specifically, it is one of the few specialists that since the emergence of new concepts related to sports training, of particular importance psychological factor and the central and peripheral nervous system in movement execution, when made reference to detente.

*Age, detente and power.* Training of force in children was and is controversial. Fear of injury or premature stop the growth process in the past made the children be kept away from working with different weights. Recent studies have shown that the risk of accidents is relatively small and the

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strength training can help prevent them. For example, most accidents occur at the level of athletics ligaments and tendons. From this point of view, it can be said that a progressive intervention of force training, optimal design, will help enhance their process, such as athlete much better prepared to meet requests training and competitions. Preparation of force and provide a solid basis for further phases in the highest performance [2].

## II. DEVELOPING METHODS FOR HOLDER AND POWER

*Training pliometry.* Training is pliometric strictly anaerobic and uses the energy potential of a muscle prior to an act characterized by explosive effort, using a maximum power, the ground support legs are as short as possible.

*Methods based on the principle of muscle tension changes.* They start from the presumption that a contraction pliometric is composed of three phases: the eccentric, isometric a short time, the concentric.

Isometric contractions expressed, by their very nature, that during their event there is no movement. If account is taken of the fact that detente is influenced by passive structures, then isometric contractions, judicious dose may be considered beneficial development detente.

Isotonic contractions relate to muscle tone, which should involve a constant load. This is because, in most cases the changes levers, gravity positions are not essential to the relationship between muscle tension and force resistive.

Izokinetic means a constant speed contractions involving muscle shortening that is contracted. As the speed of implementation increases, the number of fibers which can make such a contraction is reduced, adding to the weight of the contractor, which corresponds to a single motion without izokinetic load. And this kind of means can be taken into account in making development of detente.

Contractions expressed as auxotone contraction speed and muscle tension that varies concomitantly. The means of expression are multiple and used usually moves from or made on inclined plane. They are more efficient with how it performed with a higher speed, the more than auxotonic.

Pseudo-contractions are movements carried out in special cases when resistive force (weight or load) exceeds the driving force of the muscles involved in movement (ability contraction), contraction is eccentric type / failure). Since this kind of contractions that there is no possibility of control of movements of transfer, it must be performed only in the devices and devices capable of limited movement with safety devices.

Over-speed contractions or supra-maximal contractions caused by a synergistic muscle strength in supporting it. In normal cases, when the contraction movement is performed by weight, or weight of the segment involved, we are dealing with a movement full speed.

*Synthetic method.* It simultaneously addresses all pliometric components contraction. The shortcomings are that you can

install custom gesture of driving, with repercussions on the progress, such as when a high jumper in using training as a means of repeated jumping. This method involves two choices: to work with relief and work with adds.

*Analytic method.* It contributes by selective type from the point of view of eccentric isometric and concentric things. Certainly, this does not mean that lifelong training is working in one way. Efficiency is greatly increased if the alternate types of work. Amid natural to obtain high performances have developed different variants of this method.

*Method of effort by contrast or „Bulgarian method”.* In this method the alternation of work with heavy load with an easy, Bulgarians have replaced the last of pliometric exercises so that the series does appear the following form: 2 repetitions - 70 % + 4 jumping fences 4 feet closer than 2 repetitions + 70% + 4 jumping fences over 4 feet closer. This series is repeated for 6-8 times.

## III. ORGANIZING AND CONDUCTING RESEARCH

*Premises.* Jump size through triple extension, without enthusiasm or rapid flexion is considered as a measure of detente anaerobic absolute maximum instantaneous power. Evaluation indices show the detente is necessary to approach the primary or secondary selection and subsequently to establish the level of training even though the two issues are subject to a large extent in terms of genes.

*Hypothesis.* By applying the correct, timely, systematic and continuing during the hours of physical education and / or sports training, the specific means and methods, can be influenced significantly increased indices of expression of detente and maximum anaerobic power in children and athletes preteen.

*Subjects.* The research involved a cross-type educational experiment that was conducted in five urban schools, a total of 489 children, of which 275 girls and 214 boys in classes V-VIII. The School choice was envisaged that their students can conduct physical education activities during the cold season in sports halls specially built for such activities.

In order to achieve the tests were involved teachers from schools and students said the program of physical education and sports are in schools that pedagogical practice. Initial and final testing took place under the same conditions for all subjects at the beginning of the semester I in the terminal that the second half of the school year 2005-2006. A relatively small number of subjects (15%) practice athletics, basketball, football, judo, wrestling in the profile sections at the Sport School of the city environment or recalled. Most of the subjects are engaged in independent practice activity exercise, in various forms, outside school, daily or weekends.

*Methods used.* To achieve the study were applied several established methods of research: scientific-methodical literature review, observation tutorials, tests and measurements, the experiment teaching math and processing of statistical, graphical and tabular representation method.

*Means used.* There were used two types of practice, a predominantly pliometric force development with or without objects, including other education specific speed exercises, for example - Running short of 15-20 m, with departures from different positions (relay games, movement); Running between two landmarks located just 3 m (relay), running with knees up, with legs swinging back and forth, running to climb and descend the stairs, running to change direction, standing starts, with acceleration on 15-20 m; running distances 20-30-40-50 m. To create a correct pliometric program must know that the exercises vary in intensity level and are classified into different groups to ensure better progress:

1. Low impact exercises - including jumping rope, lift, jumping small steps, steps jump and bounce, jumping over low hurdles of 25-30 cm, throwing a medicine ball, exercises with elastic bands;

2. High-impact exercises - including the long jump and multi-jumps place, jumping over obstacles of 35 cm and higher, jumping into deep water and counter-movement.

Basically, there are 5 levels of intensity of pliometric exercises, we will present the following table, along with recommendations on their volume lesson and rest intervals (Table 1):

TABLE 1  
PLIOMETRIC EXERCISES BY THE LEVEL OF INTENSITY

| Level of intensity | Type exercises                                          | Intensity exercises | Nr. repetitions and sets | Nr. repetitions per lesson | Interval of rest between sets |
|--------------------|---------------------------------------------------------|---------------------|--------------------------|----------------------------|-------------------------------|
| 1                  | Counter-jumping high, > 30 cm.                          | Maximum             | 8.5 x 10-20              | 120-150                    | 8-10 min.                     |
| 2                  | Jumping in depth 80-100 cm                              | Very high           | 5-15 x 5-15              | 75-150                     | 5-7 min.                      |
| 3                  | Exercises with jumps:<br>- On both legs<br>- On one leg | Sub-maximal         | 3-25 x 5-15              | 50-250                     | 3-50 min.                     |
| 4                  | Counter-Jumping lower 20-30 cm                          | Moderate            | 10-25 x 10-25            | 150-250                    | 3-50 min.                     |
| 5                  | Jumping low impact / target shooting                    | Minor               | 10-30 x 10-15            | 50-300                     | 2-3 min.                      |

*Results and their interpretation.* Intervention by the means mentioned in physical and sports activities of students during a school year allowed the surprise of changes in performance recorded from a test to another. Starting from the fact that detente is a dimensionless quantity and its measure is given by vertical jump height and maximum instantaneous anaerobic power is work done per unit time following registration times and boost phase of the flight period, students during the two tests, could calculate the indices of these two parameters: height of vertical jump and maximum instantaneous anaerobic power.

Taking into account the large number of pupils and students in each year of study, relatively large percentage of their school population, relative to age and sex, participate in the test samples are representative. Thus, for example in the city where they conducted research there are 13 schools with an average of 2 classes each, from a look at the eighth with an

average of 23 students each. Of the 598 students who attended the fifth grade, the total number of 286 boys, 100 were tested, representing a rate of 34.90% and in girls, the number of 312 were tested 149 (48.06%).

Regarding the average values of vertical height based on results from initial testing situation is as follows: the class V, the reference, the average performance achieved by the subjects is at 23.18 cm, while in the experimental recorded 22.27 cm, grade VI, witness, the average is 23.61 cm and 22.84 cm for the experimental to the VII, 23.98 cm for the reference class and 24, 11 cm for the experimental one, the eighth grade was calculated for an average of 24.16 cm and 23.59 cm reference grades for classes of experiment. As can be seen from data of expression level of detente is one higher in the control classes, but changes the values suffer from the second test (Fig. 1).

Thus, the classes will be progressing from 1.41 cm to reference classes (value recorded 24.57 cm), and the classes of experiment 3.73 cm (25.98 cm recorded value). The sixth grade class' reference values have progressed by 0.76 cm and 2.91 cm class experiment (values recorded 24.35 cm, 25.73 cm respectively).

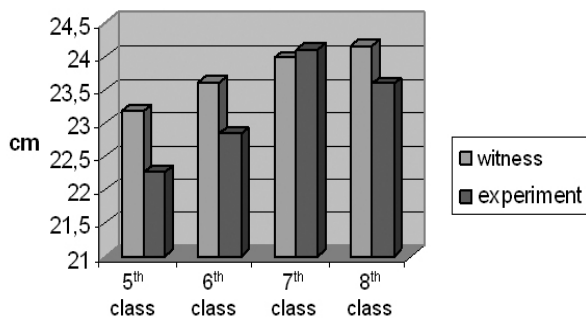


Fig. 1. Comparative values of the initial test

In grade VII rates of progress are increasingly registering values of 1.94 cm, 3.3 cm respectively (data recorded 27.12 cm 25.90 cm) for the two categories of subjects.

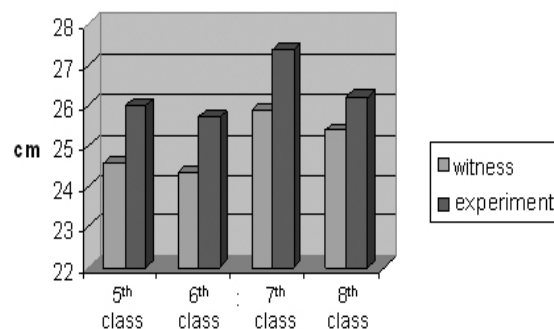


Fig. 2. Rates of progress of his detente at the end of the experiment

Classes VIII again before we make progress decreased 1.25 cm, respectively c 2.65, from 24.14 cm to 25.39 cm in reference classes, and from 23.57 cm to 26.22 cm classes of

experiment. Those values, expressed as a percentage, are given in Figure 2.

Analysis of data presented and their comparison chart shows an initial increase in expression of the vertical height of 6.8%, respectively 16.76% for classes you reference and experiment. In sixth grade, the rate of progress is at 3.22% to reference classes and 12.75% in the experimental classes.

Regarding grade VII, is an increase of 8.09% to reference classes, respectively 12.57% in the experimental classes and in eighth grade of 5.17%, to classes reference, and 8.30% in classes of experiment.

Statistical indices calculated at the beginning and the end of this experiment allow classification control and experimental classes in the category caterers with a mean uniformity and standard deviations calculated us to say that indicates a degree of dispersion rather than from the average (Fig. 3).

The values recorded for reference grades will increase by 14 W shows, from 351 W at testing 1 to 365 W testing 2, and the classes of experiment progress is 59 w, 402 w testing from 1 to 461 W at second.

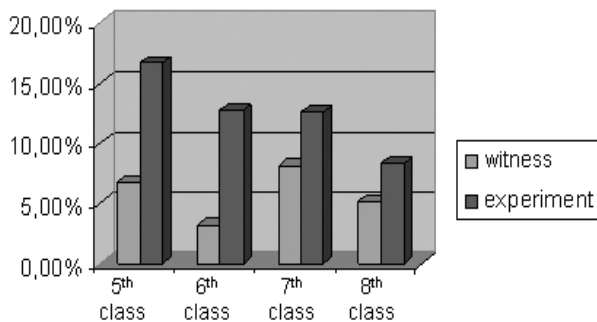


Fig. 3. The rate of increase compared with the initial values of detente

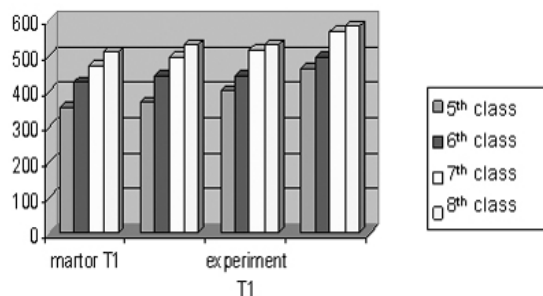


Fig. 4. Evolutionary stage of maximum instantaneous anaerobic power

The sixth grade is increased by 16 W from 429 W to 445 W, the reference classes and the classes of experiment 49 W, from 444 W to 493 W. In class VII of reference biological rate of progress is 22 W from 472 W to 494 W, and the rate of progress experiment classes is 54 W from 516 W to 570 W.

Classes VIII shows that the values of increase of 18 W from 512 W to 530, and the classes of experiment 51 W, from 532 W to 583 W. What must be noted is constantly changing

during class V - VII of the rate of progress in less than eighth grade, relative to the age and development (Fig. 4).

Percentage rates of progress of the experiment to the class reference is as to fifth grade classes from 3.98% to 14.67% from reference and experimental classes and in classes VI to 3.72% from reference classes, ie 11.03% in the experimental classes.

In grades VII, values are at 3.56% to 10.46% reference classes to classes of experiment, and the eighth grade reference, the percentage rate of progress is 3.51%, and the reference to 9.58% in the experimental classes (Fig. 5).

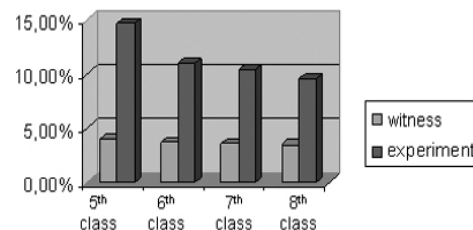


Fig. 5. Rates of progress of maximum anaerobic power expressed in percent

Girls at grades in estimating  $t$  calculated:  $t = 3.85$ , by Student special table, the degrees of freedom for the reference class Săriturii vertical height are  $n - 1 = 20$ . After distribution of values of Table 7 for 20 degrees of freedom to the materiality  $P = 0.05$ ,  $t = 2.086$  and  $P = 0.01$   $T * 2.845$ , yielding the value found indicates a significant difference between the two environments. For the same conditions tabular Student in the instant of maximum anaerobic power, calculated  $t$  ( $t = 7.95$ ) indicates significant differences between the two environments.

In assessing the value of  $t$  calculated:  $t = 18.03$ , for vertical jump height, as special student table, degrees of freedom for the classes of experiment are  $n - 1 = 119$ . After the table of  $t$  distribution values for 119 degrees of freedom at the threshold of significance  $P = 0.05$ ,  $t = 1.979$  and  $P = 0.01$   $t = 2.621$ , that value indicates a significant difference found between the two areas. For the same Student tabular conditions in the power of  $t$  calculated:  $t = 3.294$ , after Stuedent special table, the degrees of freedom for the reference class vertical jump is the  $n - 1 = 21$ .

After the table of  $t$  distribution values for 21 degrees of freedom to the materiality  $P = 0.05$ ,  $t = 2.080$  and  $P = 0.01$   $t = 2.831$ , indicating that the amount found significant value between the two environments. For the same conditions tabular Student in the instant of maximum anaerobic power, calculated  $t$  ( $t = 4.13$ ) indicates significant differences between the two environments.

In assessing the value of  $t$  calculated:  $t = 5.25$ , for vertical jump height as special student table, degrees of freedom for the classes of experiment are  $n - 1 = 91$ . After the table of  $t$  distribution values for 91 degrees of freedom to the materiality  $P = 0.05$ ,  $t = 1.987$  and  $P = 0.01$   $t = 2.633$ , that value indicates a significant difference found between the two environments.

For the grade for boys, the appreciation of the value of  $t$  calculated = 4.005, by Student special table, the degrees of freedom for the reference class Săriturii vertical height are  $n - 1 = 19$ . After the table of  $t$  distribution for 19 degrees of freedom to the materiality  $P = 0.05$ ,  $t = 2.093$  and  $P = 0.01$   $t = 2.861$ , that value indicates a significant difference found between the two environments. For the same conditions tabular Student in the instant of maximum anaerobic power, calculated  $t$  ( $t = 5.69$ ) indicates significant differences between the two environments.

In assessing the value of  $t$  calculated:  $t = 15.70$ , for vertical jump height, as special student table, degrees of freedom for the classes of experiment are  $n - 1 = 94$ . After the table of  $t$  distribution values for 94 degrees of freedom to the materiality  $P = 0.05$ ,  $t = 1.988$  and  $P = 0.01$   $t = 2.633$ , that value indicates a significant difference found between the two areas. For the same Student tabular conditions in the maximum instantaneous anaerobic power, the calculated  $t$  ( $t = 15.81$ ) indicated significant differences between the two environments.

The sixth grade boys, in appreciation of the value of  $t$  calculated:  $t = 4.551$ , by Student special table, the degrees of freedom for the reference class vertical jump height, are the  $n - 1 = 20$ . According to the table of  $t$  distribution values for 20 degrees of freedom to the materiality  $P = 0.05$ ,  $t = 2.086$  and  $P = 0.01$   $t = 2.845$ , that value indicates a significant difference found between the two environments. For the same conditions tabular Student in the instant of maximum anaerobic power, calculated  $t$  ( $t = 6.209$ ) indicate significant differences between the two environments.

In assessing the value of  $t$  calculated:  $t = 10.347$ , to jump vertically as special student table, degrees of freedom for the classes of experiment are  $n - 1 = 77$ . After the table of  $t$  distribution values for 77 degrees of freedom to the materiality  $P = 0.05$ ,  $t = 1.991$  and  $P = 0.01$   $t = 2.641$ , that value indicates a significant difference found between the two environments. For the same conditions tabular Student in the instant of maximum anaerobic power, the calculated  $t$  ( $t = 15.611$ ) indicate significant differences between the two environments.

#### IV. CONCLUSIONS

Regardless of the field in which we operate (in this case, physical education or sports) the rules, the default principles is essential to achieve goals. Principle of gradual adaptation to applications developed in the paper is the foundation training pliometric, and beyond. Taken together, changes in detention light vertical jump height and maximal instantaneous anaerobic power, we can say that there is a favorable trend and largely significant. The highest values of the rate of progress is recorded at the classes of fifth and sixth class. The most spectacular growth in the secondary school boys entered the seventh grade, both grades of reference, and especially in the experiment. As the girls emphasized that progress is observed in sixth grade and seems to be attributed to the installation of puberty in boys is delayed by one year, which entitles us to believe that at this level and high rate of progress can be attributed same case.

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