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## PROMOTING THE WINNER CULT IN INDIVIDUAL SPORTS

***Motto:** “The only thing that stands between a man and what he wants from life is often merely the will to try it and the faith to believe that it is possible.”*

*(Richard M. DeVos-owner of the Orlando Magic NBA)*

The human being is threefold determined: biologically, psychologically and socially. Paul Popescu-Neveanu was talking about “taking possession of oneself”, emphasizing the empowerment human psychological factor in building their personalities.

Human personality as a system, presents a certain degree of constancy of events, ranging from individual to individual. In sports, the manifestation psychobehavioral is an efficiency skill, ensuring reliability of technical - tactical activities.

Athlete in the increasingly fierce competition in recent decades to achieve and exceed performance is a being who- usually - knows what he wants and how he wants, he is a product of socio-cultural ambience, but considers that the views, philosophy, knowledge, feelings and ambitions are of his own and justify his actions. We speak thus of the need for awareness of the activities and their own ideas and feelings of the athlete, a “self-awareness raising” real picture of himself, the possibility of accurate assessment of their capabilities and limitations. An optimal level of this awareness of consciousness is the ground of self-development ability - how athletes carry out their work - and self - control of their own mental states and overt behavior, qualities so admired by us in great athletes.

Sport state is considered as a state of maximum workout possible, it is reflected in a particularly good exercise capacity, fatigue resistance, indices with maximum values obtained in the preparation of physical, mental, technical, tactical and outstand-

ing results in competition and a very good capacity of global recovery after exercise, recovery only in recent years has gained great importance in the overall training of athletes, its efficacy being found in both sports results and the preservation of health and sporting longevity.

But we can not talk about the performance or performers without highlighting some concepts regarding sports intelligence (M. Niculescu, 2000)

The author believes that success or failure in sport are the consequences not only of general intelligence, but especially of sports intelligence. Sports intelligence manifests and develops in relation to sports activity, demonstrating adaptation of athlete to the training demands, contributing to changes that occur in the sample or practiced sport in terms of technique, tactics, material conditions, etc.

Psychological preparation of athletes in general and the performance in particular is a mixture of: psychomotor, cognitive, affective and volitional features. But we must emphasize the need for strict correlation between sides of preparation - physical, technical, tactical, mental and theoretical capacity: if the listed sides are not corresponding, neither mental capacity can rise to the level of desired requirement.

In 1963, discussing the aspects of mental preparation for competition Epuran made the “states of preparation” system: arrangement, anticipation, engagement, modeling, implementation / adaptation of the analysis; they have, in terms of functional-mentally, a complex emotionally- cognitive — conative character .

Psychiatric manifestations of athletes were named (M. Epuran - 1963; Spielberger C.D. — 1971; Nideffer - 1992) mental states, divided into the following categories:

- cognitive, of thinking (clarity, confusion, lucidity); of attention (concentration, distraction, vigilance); of perception (perceptual-looking sets or indicative); of memory (blockage); of the imagination (reverie, daydream) ;

- affective: home state, state of readiness for the competition, competitive and pre-competitive anxiety; reactions in situations

of frustration, failure or success (disappointment, enthusiasm, overrating); feelings (joy, pride, attachment, etc.);

- conative (volitional); determination, judgment, risk decision, militancy, aggression, abandonment and so on;

- of consciousness (referring to the whole psychic system): limit states - positive or negative, altered states — trance, hiperlucidity, perceptual distortions, self-hypnosis, hypnotic sleep, sofrologic consciousness and so on, all of which are conditions commonly encountered in sports.

One of the basic principles in psychology is that “external factors act through internal factors”; in sports, the same situation will be experienced differently from sportman to sportman, depending on skills system constitution and especially, the attitude.

The most important cases in sports are the training and competition. Training is a pedagogical situation<sup>6</sup> characterized by prolonged duration, maximal effort level, contradiction between aspirations and results, etc.. The competition is a situation of conflict, fighting for supremacy, is a generator of emotions and limit states, which can not be modeled identically in training; victory or defeat, success and failure produce current positive or negative mental states, of adjustment, inadequacy or conflict.

To become a champion, an athlete, regardless of sport he practices, needs much time and effort to gain the necessary mental skills of a winner, thereby gaining winner cult consisting of: mental energy control, sensory control, external perception, negative thinking control, anticipation / mental programming of actions, assertiveness development and combativity, control of emotions and motivation, programming of operator behavior, stress control.

The athlete’s awareness as a human being is the secret of his personality development, his own identity, his development capacity; therefore achieving self-awareness, for an athlete, is the basis for any intentional processes of preparation and performance aspiration.

Self-regulation with biofeedback provides sensory awareness and can be accomplished through self training and using electronic devices.

Analytical, progressive relaxation - Jacobson, developed by

Dr. Edmund Jacobson, is the most used technique to obtain control of anxiety in sport.

Sofrologic training is done through several techniques to harmonize the mind and body and it is based on sofrologic doctrine developed by A. Caycedo in 1960. Sofrology (sophrosyne = self-control, temperance) was defined (B. Santerre, 1989) as “the science of human consciousness, its amendments and the means to change it for therapeutic, prophylactic, pedagogical aims, to enable man to harmonize with himself and his environment. “

Mental training has become in recent decades as part of the “total training”; arguments have been made both from researchers and from the athletes who practice it. Ideomotor or mental training results in activating the neuromuscular formations and consists of repetitions in representation, based on acquired ability - through training and more exercise - to acknowledge their actions and to refresh through thinking and verbalization. Currently, mental training is used in the preparation of athletes focused on performance, to strengthen and improve the basic technique that has already been acquired.

Positive thinking exercises are based on the techniques of auto-suggestion and subvocal speech (internal language) of thoughts in positive form, which is very important to note in these exercises is that positive thoughts, subvocal speech or on paper, must be well anchored in reality, having the probability of actually leading to further education and performance - in short, the purpose to be real. Positive thinking, as shown by Irina Holdevici, not just about the optimism, but also constructive guidance in finding solutions.

Yoga techniques - most commonly used in sports training is Hatha Yoga - aim at disciplining psychological and physiological functions of the individual, putting them under voluntary control; once achieved this goal, the athlete achieves better health and increased efficiency / work performance, increasing resistance to stress factors and exercise capacity of the body.

Hypnosis, as altered state of consciousness, is used as a method of self-regulation of mental states in athletes, through various changes as needed: changes in the field of sensory, motor

area or sphere of thought; using hypnosis, an athlete can obtain negative emotions and competition anxiety attenuation, increasing resistance to stress and ego strengthening, mental barriers elimination.

Unestahl considered the thinking changing in high performance, noting that in the champions' mind are carried information processes characteristic to the hypnotic state. Thus he found that the ideal state conducive to restraint performance requirements are for the moment forgotten, the performer thus being able to live moments - decisive for victory - the overtaking of his possibilities.

Zen attitude (Orlické, 1980) is a practical application of the doctrine of Lao-tzuan "doing by not doing" or, in other words, the suspension of critical thinking. It was found (Gallaway and Krieger) that the best way to deal with a summit situation is to clean up the field of consciousness of useless thoughts and program the system to operate on "autopilot" - his own subconscious.

Zen attitude applies only to athletes who have practiced and mastered the technique well. Moreover, the maximum underlying this technique of psychological preparation is as follows: "You have reached perfection when your body, your legs will carry, by themselves, what they have learned, without the intervention of the mind."

Intensity, volume, complexity, duration of work, emotions, stress, race partners adversity, the public and monotony, hardness, cyclicity, training extension, requirements of training programs, diet and the rigorous regime of training camp, all or part of them may induce mental fatigue, besides the motor and biological ones. Mental fatigue is manifested by multiple neuropsychological signs: unsteadiness, fatigue, decreased alertness and mental responsiveness, resistance to stress. Such condition directly influences mental preparation and competition potential; it requires qualitative and quantitative changes of the effort regime. Mental fatigue, unnoticed or ignored and become chronic, can partially or permanently affect an athlete's career.

It is therefore very important that training, even or especially

of the performance athlete, stimulate the body to adapt to the demands of sport, in achieving step by step performance. By the combination of natural and driven recovery it is performed, in addition to the return of the body to the values it had before exercise, an increase in the possibilities of over-compensation.

Elite athletes recognize the importance of lifelong psychological training from junior up to obtain absolute records. Lanny Robert Bassham, winner of gold medal in shooting test of the Olympic Games in 1976, is a good example to illustrate the vital importance of psychological preparation. In 1972, Bassham participated in the Olympic Games in Munich, gun shooting test, targeting winning the gold medal, but he only won the silver medal, which caused him great frustration.

Therefore, he heard up several seminars on mind control in stressful situations, but was not satisfied. After the experience of 1976, when he became world champion in shooting test of the Olympics, interviewed several gold medalists to discover what they did or thought otherwise, to become winners.

Following these experiences, Bassham created a system of mental control that he called Mental Management (Mind Control). Over the next six years, Lanny Bassham dominated his sport, sport shooting gun, winning 22 world individual and team titles and setting 4 world records. In the past 31 years, Lanny Bassham initiated and trained in mind control world and Olympic champions and employees of the United States Secret Service, U.S. Navy SEALs, U.S. Marine Corps Marksmanship Unit, FBI.

Athletes are never afraid of loss (or should not be). For them, every desire, every dream and everything they think or do is an existential tool in practice, a short way firstly to the lower targets (learning techniques), and a broad road toward a major goal - achieving record performance. For an athlete, competition is more with himself than with others, psychological training techniques supporting him in the competitive maturing process.

Romanian explanatory dictionary gives, as the first definition of performance, a “result (particularly good) obtained by a person in a sports competition. “



But we will go in the closing of the work, little more in the depth of the term, performance means absolute, perfect - at least when it is achieved, performance means a huge accumulation of own resources, physiological and psychological, but also the result of countless hours , days, months and years of specific effort. Performance means team work, even if a sport is individual (the coach participates actively in the preparation of the athlete, also the psychologist, the doctor, etc.). Performance is synonymous with success, having identical dimensions: knowledge, skills, consistency, convergence and faith. All this is contained in the mystery and the winner cult, defining quality of high class performers.

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## THE RELATIONSHIP BETWEEN LATERAL MOVEMENT AND POWER IN FEMALE ADOLESCENT BASKETBALL PLAY

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### **Abstract:**

**Purpose.** *Lateral movement is an important quality to performance in basketball. The relationship between lateral movement as measured by a side-step test and power as measured by a lateral hop and vertical jump is largely unstudied.* **Methods.** *Female adolescent basketball players ( $n = 51$ ) participated in this study. The study used a Pearson's product-moment correlation to measure the relationship between the lateral side-step test (LST), countermovement vertical jump (CMVJ, and lateral hop (LH). Results. There was a moderate relationship between LST and LH ( $r = .487$  to  $.626$ ,  $p < .001$ ), and a small relationship between the LST and CMVJ ( $r = .279$ ,  $p = .048$  to  $.309$ ,  $p = .028$ ). There was a moderate significant relationship between CMVJ and LH ( $r = .370$ ,  $p = .008$  and  $r = .441$ ,  $p = .001$ ). Conclusions. These results suggest that the plane of movement affects the relationship of power and lateral movement in adolescent female basketball players.*

**Keywords:** *agility, change of direction speed, vertical jump, lateral shuffle*

The relationship between vertical jump (VJ) height and change-of-direction speed (CODS) has been well-studied, and a significant negative relationship between VJ height and CODS time has been established<sup>1,2,3</sup>. An athlete who jumps higher will tend to be faster on a test of CODS. The relationship should be expected, as a negative relationship between VJ and linear speed has been established<sup>4,5</sup>, and most tests of CODS have incorporated linear sprinting<sup>6</sup>. Different tests of CODS have been grouped together as one quality regardless of the number or angle of directional changes. However, the percent change between an 8m sprint and an 8m sprint with a 20-degree cut was only 1.8%, whereas the percent change between an 8m sprint with a 40-degree cut and an 8m sprint with a 60-degree cut was 11.3%<sup>7</sup>. Similarly, significant differences were reported between angles of 30, 60, and 90 degrees<sup>8</sup>. These differences suggested that the angle of the cut used in a CODS test changes the movement, and the relationships between these tests and other qualities like speed and power may differ based on the angle of the cut.

Sagittal-plane training has dominated training programs for multi-directional sports performance<sup>9,10,11</sup>, and the VJ test has been the primary measure of leg power<sup>12</sup>. Plyometric training (PT) has been a popular training modality<sup>9,10,11</sup>, and has been shown to improve VJ and CODS<sup>3,6,9,13,14,15,16,17</sup>. However, the improvements of PT alone on tests of CODS have been small. Multi-direction PT programs have found better practical improvements on CODS performance<sup>13,15,16</sup> compared to studies that trained only in the sagittal plane. Therefore, the relationship between VJ and CODS may be affected by the test and by the specific training stimulus.

Further complicating the relationship between power and CODS, some tests of CODS have incorporated movements other than sprinting and small directional changes. The Edgren Side-Step Test (ESST), T-test of agility, and Lane

Agility Test (LAT) have incorporated lateral shuffling, and the T-test and LAT have incorporated backpedaling. Lateral shuffling and backpedaling are important movements in basketball, and have been found to account for as much as 41% of the movement time in a game of adolescent males<sup>18</sup>. In the T-test, participants sprint forward, shuffle laterally, and sprint backward in the pattern of a T<sup>19</sup>, whereas in the LAT, participants sprint forward, shuffle laterally, sprint backward, and shuffle laterally in the shape of a box<sup>20</sup>. In the ESST, participants shuffle side to side<sup>21,22</sup>. Whereas these have been considered tests of CODS, the T-test was found to have a stronger relationship with leg speed than with the Hexagon Agility Test, an established measure of CODS<sup>23</sup>, and the T-test was used to establish the reliability and validity of the LAT<sup>20</sup>. Furthermore, no reliability or validity information for the ESST has been established<sup>20</sup>.

The number of different procedures for tests of CODS, and the significant differences between different angles of directional changes, has suggested a lack of specificity with CODS<sup>24</sup>. This lack of specificity has complicated the study of the relationship between power and CODS. Since tests such as the ESST, T-test, and LAT differ in execution from tests such as a 20-degree directional change, the relationship with power may differ as well. The purpose of this study was to determine the relationship between sagittal-plane power and frontal-plane power, and between the two measures of power and CODS performance in the frontal plane. A lateral hop (LH) for distance was used as the measure of power in the frontal plane. A countermovement vertical jump (CMVJ) was used as the measure of power in the sagittal plane. A lateral shuffle test (LST) was used as the measure of frontal-plane CODS. The hypothesis were that the LST would be independent of CMVJ, but related to LH, and that there would be a positive relationship between CMVJ and LH.

### **Methods. Participants**

The participants were 51 female high-school varsity basketball players from the western United States. The participant characteristics were: age 15.86 +/- 1.15, height 171.47 +/- 7.34 cm, mass 61.29 +/- 7.93 kg. The participants were recruited by contacting their high school and club coaches. The participants had varied training histories, but all were involved in an off-season strength training program with their team. None of the participants had sustained a significant ankle, knee, hip, or back injury in the prior 6 months. The study was approved by the University Institutional Review Board, and written parental and participant consent was completed prior to the data collection.

### **Study Design**

The study used a within-groups repeated measures design. Each participant completed 5 tests: CMVJ, LST (dominant and non-dominant), and LH (dominant and non-dominant). The participants were given a demonstration of each test and completed several sub-maximal and one maximal practice trial to familiarize themselves with the different tests. After the familiarization period, the participants completed three test trials of the CMVJ and LH, and one test trial of the LST. Participants were given 60-90 seconds to recover between trials<sup>25</sup>. The tests were completed in a randomized order in a single session, and the best performance of each test was used for analysis.

### **Procedures**

Participants reported to their high-school gymnasium for testing during a normally scheduled basketball practice in the off-season, approximately one month after the final game of their season. Upon arrival, the participants presented

signed permission forms, and were asked for their height, weight, and age. After a 10-minute, standardized warm-up (Table 1), the tests were explained and demonstrated to the participants, and the participants had time to familiarize themselves with the testing procedures. The testing took place on a wood floor in the high school gymnasium.

**Table 1.** Standardized warm-up exercises

<p><i>Unless otherwise noted, do the exercise from one sideline to the other.</i></p> <p>Jog                  Backpedal                  Quick skip                  Quick skip (thigh parallel to the ground)                  Skip (knee above hip)                  High skip (reach as high as possible)                  Monkey shuffle (lateral shuffle with arm swing)                  Carioca                  Sumo squat x10 (stationary)                  Hip turn and walkover                  High knees                  Butt kicks                  Walking lunge (elbow to instep)                  3/4 speed sprint                  Backpedal                  Stork stretch                  Knee hug                  3/4 speed sprint                  Backpedal</p>
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**Countermovement vertical jump (CMVJ).** A Vertec device (Jumpusa, Sunnyvale, CA) was used to measure the height of the jumps to the nearest half inch (1.27 cm). To prepare the Vertec, the participants stood under the Vertec and reached with one arm in order to measure their standing reach. The participants were instructed to use a no-step, countermovement jump. The participants were allowed to swing their arms, and were instructed to jump as high as possible and reach for the vanes. To begin the test, the

participants stood in an upright standing position. When ready, the participants flexed at the ankles, knees, and hips to make a preliminary downward movement, then extended their ankles, knees, and hips to jump vertically. At the top of their jump, the participants hit the vanes. Their vertical jump was measured as the difference between the highest vane hit on their jump and their standing reach. Participants completed 3 jumps, and the best jump was used for analysis.

**Lateral hop (LH).** The participants started in a standing position with the medial border of their shoe behind a line taped on the gym floor. When ready, they raised their other leg off of the ground and flexed at the ankles, knees, and hips on their stance leg to make a preliminary downward movement. They extended their ankles, knees, and hips to hop medially in the frontal plane. Participants landed on the same leg to reduce the effects of leg length on the distance measurements. The distance of the LH was measured with a tape measure to the nearest millimeter from the starting line at take-off to the point nearest the starting line at landing. The participants completed 3 trials on their right foot and 3 trials on their left foot. The best performance for each foot was used for analysis. The trials were recorded for the right and left leg, and transformed to dominant (LH-D) and non-dominant (LH-ND) legs. Previous studies have identified a dominant and non-dominant leg for power exertion and for functional exertion<sup>26</sup>. The dominant leg was determined to be the leg that produced the greatest distance on the LH, which represented the dominant leg for power exertion.

**Lateral shuffle test (LST).** The LST was chosen as the test of CODS because other tests of CODS have been shown to have a stronger relationship with straight-ahead speed than another test of CODS<sup>23</sup>. The LST was devised because there is no single ESST<sup>21,22</sup>. Pilot testing found an 8-foot distance to be superior to a 12-foot distance as a measure of



CODS, and no difference was found between a 6-second and a 10-second time frame. Therefore, this study used the 8-foot distance and 6-second time frame.

The test was marked with white athletic tape on the hardwood floor. A distance of 8 feet was marked with lines marked every 2 feet. The participant's score was the number of lines crossed during the duration of the test. A video camera (Flip Mino HD, Cisco Systems, Irvine, CA) was used to capture the trials, and the scores were counted and confirmed via video analysis. The time started on the participants' first visible movement. The participants started in an upright standing position straddling the center line. On the researcher's verbal signal, participants side-stepped from side to side continuously for 6 seconds. Participants were instructed not to cross their feet during the duration of the test, and a trial was discarded if a participant crossed her feet. The outside leg had to cross the outside line before changing directions. Each participant completed one test trial starting with her dominant foot (LST-D) as her push-off or trail foot and one with her non-dominant foot (LST-ND) as her push-off or trail foot.

### **Statistical Analysis**

SPSS (version 20.0, Chicago, IL) was used to analyze the data. A Pearson's product-moment correlation was used to determine if any of the personal characteristics had a significant relationship with the five tests. A Pearson's product moment correlation was used to determine the relationship between the five tests. Statistical significance was set at  $p < 0.05$ .

### **Results**

The means and standard deviations for the five tests are shown in Table 2. The LST is reported as the number of lines

crossed within the 6-second period. The LH and CMVJ are reported in cm.

**Table 2** Means and standard deviations for the tests of CODS and power (n = 51)

	Mean	Std. Deviation
CMVJ (cm)	45.82	5.93
LH-D (cm)	140.31	13.37
LH-ND (cm)	133.40	12.67
LST-D	22.71	2.14
LST-ND	22.65	2.23

**Note:** CMVJ = countermovement jump; LH = lateral hop; LST = lateral shuffle test; D = dominant; ND = non-dominant. LST is measured as the number of lines crossed.

Height and weight had a strong positive relationship,  $r = .521$ ,  $p < .001$ , but there were no significant relationships between the personal characteristics and the tests. The inter-correlations for the 5 tests are shown in Table 3.

**Table 3.** Correlations for the tests of CODS and power (n = 51)

	LH-D	LH-ND	LST-D	LST-ND
CMVJ	.441** 0.001	.370** 0.008	.309* 0.028	.279* 0.048
LH-D		.904*** 0.000	.626*** 0.000	.487*** 0.000
LH-ND			.609*** 0.000	.488*** 0.000
LST-D				.853*** 0.000

\*\*\* Statistical significance ( $p < .01$ ), \*\* Statistical significance ( $p < .05$ )

**Note:** CMVJ = countermovement vertical jump; LH = lateral hop; LST = lateral shuffle test; D = dominant leg; ND = non-dominant leg

## Discussion

Power and CODS have been shown to be different, but related physical qualities in tests incorporating primarily sagittal-plane movements. This study incorporated movements in the frontal plane. The results did not confirm the first hypothesis, as there was a small, but statistically significant relationship between the CMVJ and LST. The results confirmed the second hypothesis, as there was a moderate relationship between the CMVJ and LH.

The results suggest that the plane of movement has a small effect on the relationship of power and CODS in female adolescent basketball players. There was a strong relationship between the LST and LH compared to the small relationship between CMVJ and LST. Vertical ground reaction force (VGRF) has been found to account for much of the total force in a COD task<sup>1</sup>, and greater VGRF has been found to correlate with better performance in a lateral movement test similar to the LST<sup>27</sup>. Regardless of the direction, movement requires VGRF, as shown by the relationship between the CMVJ and LST. Despite the importance of VGRF to CODS tasks, this study found a stronger relationship between the LST and LH than the relationship between the CMVJ and LST, attesting to the specificity of movement. This movement specificity suggests a need to diversify common sagittal-plane dominated training programs for multi-direction sports<sup>9,10,11</sup>.

The specificity of the LST and LH movements may have been the angles created by the leg to initiate the movements. Young et al.<sup>7</sup> identified foot placement, body lean, and posture as factors that affected COD technique, and Wilson et al.<sup>11</sup> has found the posture of movements to affect the transference of strength. The foot placement, body lean, and posture between the LH and LST may have been similar and strengthened the relationship between the two tests com-

pared to the CMVJ, which utilized a different foot placement, body lean, and posture. The specificity between the LST and LH also may have been the unilateral nature of the tests compared to the bilateral CMVJ. A unilateral squat compared to a bilateral squat was found to have a greater relationship with CODS<sup>28</sup>. The author speculated that an unilateral squat compared to a bilateral squat demands greater balance, stability, and coordination similar to CODS tasks<sup>28</sup>, which have been considered relatively complex<sup>14</sup>. This complexity may weaken the relationship between CMVJ and CODS<sup>14,29</sup>. However, the LH compared to the CMVJ may have been similarly complex and demanding in terms of balance, stability, and coordination, and therefore shared a stronger relationship with the LST.

The asymmetries between the dominant and non-dominant legs in this study fall within the differences reported elsewhere. An asymmetry between 10 and 15% has been described as typical and acceptable in non-injured populations<sup>30,31,32</sup>, and significant differences between dominant and non-dominant legs have been identified in unilateral vertical jumps<sup>30</sup> and a horizontal hopping test<sup>33</sup>. However, this is the first known study to identify asymmetries in a lateral-hop test.

The primary limitation to this study is a lack of validity information available for the LST and other similar shuffling tests. Also, whereas the study used high-school athletes, this population of female high-school basketball players may have lacked the strength and power to generalize these results beyond female high-school basketball players. College women's basketball players and male high-school basketball players would be expected, on average, to have a higher VJ<sup>34</sup>, which could affect the relationship to the CODS test.

To maintain consistency, and exclude a potential confounding variable, the VJ test could be performed as a unilateral test to match the LH and LST. Similarly, a CODS test

with a greater sagittal-plane element, a cut with a smaller degree, could be used to compare the relationships and exclude the choice of test as another factor.

This study examined the relationship between power and CODS specific to a CODS test in the frontal plane. Based on the results from this study and a study that found approximately 41% of a basketball game to be spent in movements similar to those used in the LST<sup>18</sup>, adolescent female basketball players should train to improve frontal-plane performance in order to improve CODS in basketball-specific tasks.

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## STUDY ON THE EFFICIENCY OF THE CURRENT SELECTION FOR FIRST STAGE IN ATHLETICS IN ROMANIA

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### **Abstract.**

*The aim of the research is to demonstrate the efficiency and make relevant conclusions on the current selection system for the first formative stage in Romania, in athletics. **Methods:** For this, we made a bibliographic study on the volumes “Technical Results” of the Romanian Athletics Federation, whose objective was to know the efficiency of the selection system for the first stage formative in athletics, system that was promoted in the 80s, and still available. The study was conducted by researching the evolution of three generations of athletes, who began their sportive activity at the Children category I, in 1988, 1989 and 1990. **Results:** Following this general analysis of the three generations, we can say that athletes selected on the basis of current criteria fail to cover the necessary talent, a claim supported by the fact that only a small percentage of the athletes had a representative and longevive career in sports and valorous results. **Conclusions:** We found that the current selection from Romania, to the many samples that are selected for future athletic performers, has a limited number of tests, physical only, which does not offer the possibility to select young professionals with high predisposition favoring practicing athletics performance and recovery performance potential in various athletic events.*

**Key words:** selection system, real data, evaluation

**Introduction.** For appreciate the efficiency of the current selection system in Romania and for demonstrate that the tests of which is composed this system highlights the complexity of the skills of the future athletes, we achieved a research on three generations of athletes who have evolved from Children under Senior career category, selected according to the tests and standards in force.

**Methods.** The target group of this research were the athletes that I found in the volumes „Technical Results” developed by the Romanian Athletics Federation. Thus, we inventoried athletes of the 1988, 1989 and 1990 generations of children, who participated in the indoor and outdoor national championships, by name, and studied their evolution in his sports career.

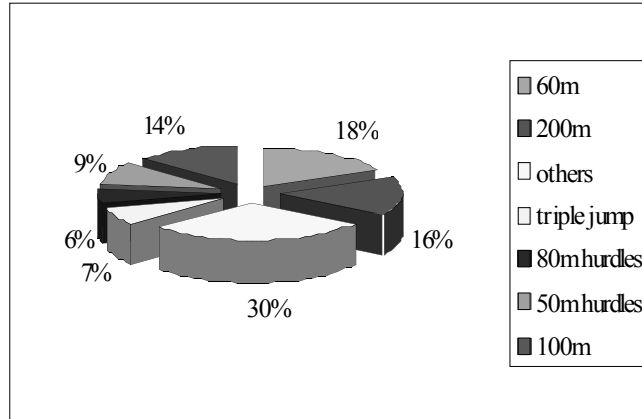
We studied every indoor and outdoor national championship, each athletic event from the competition, each performance and each place occupied by the subjects for highlight stagnations, backwards, performances and abandonment of the sport career by the subjects.

Since 1989 more results are centralized in the national championships, so it was possible both to identify athletes who continued their sportive career and new entrants in competitive activity.

The study aimed to research the following issues: evolution in performance, stagnation, regression, longevity, dropping in both sexes and, therefore, the analysis will be conducted separately on female and male.

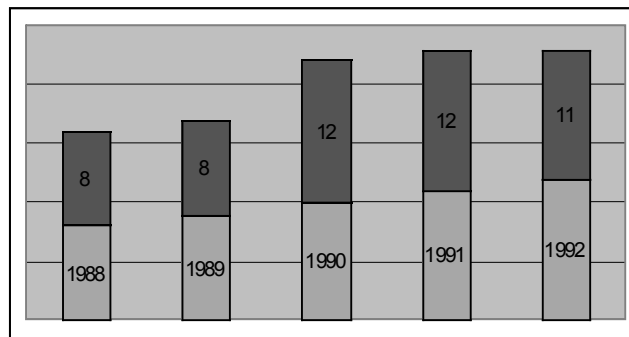
### **Results and discussions**

**1988 Generation.** 88' Female Generation was characterized by a concentration of athletes participation in speed events: 60m -18 % of the total participations, 200m -16% and 100m-14 %. It is also remarkable evidence of hurdles events, 50m and 80m at a rate of 9% respectively 6% and triple jump event at a rate of 7%. (fig.1)



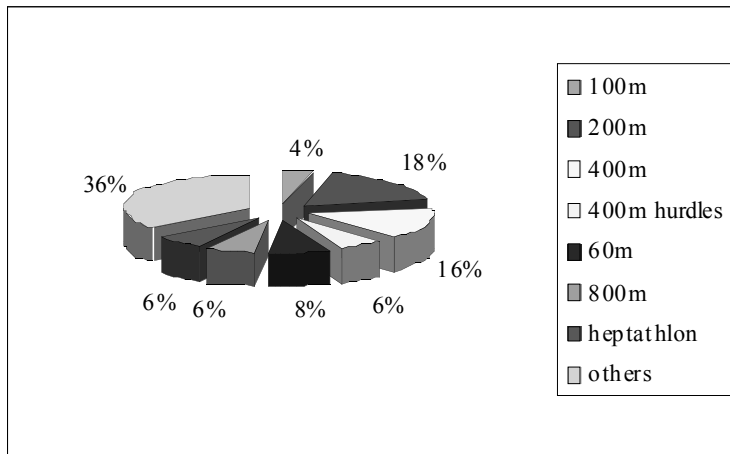
**Figure 1.** Graphical representation of the athletic events expressed as a percentage of 1988 female generation

For generation 1988 competition years 1990 and 1991 represented a peak of participation in National Championships with 12 participations of athletes of this generation; in the following year, the number of participations decreased slightly to 11, after which, since 1993, the junior I athletes have withdrawn from athletic competitions, their results were no longer found in any National Championship.(fig. 2)

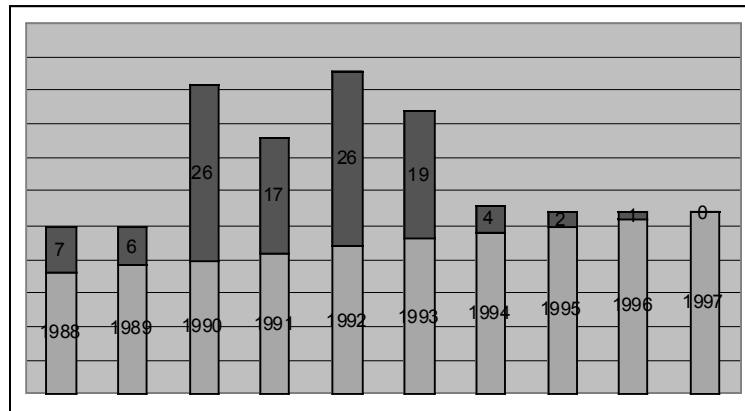


**Figure 2.** Total number of participations of 1988 female generation in competitive activity

Compared to the female generation, the male generation showed a higher participation rate in events of running longer distances, the predominant event being 200m running, with a percentage of 18 %, and 400m running -16%, while events like 400m hurdles and 800m had a participation rate of 6%. (fig. 3)



**Figure 3.** Graphical representation of the athletic events expressed as a percentage of 1988 male generation



**Figure 4.** Total number of participations of 1988 male generation in competitive activity

**1989 Generation.** Compared with the generation 1988 predominating running events, in the case of female generation 1989,

participation in jumping events was predominant. So, long jump event received 25% of total participations to the national championships, and the triple jump 15%. This participation rate is due to highlight in this generation of some valuable athletes.(fig.5)

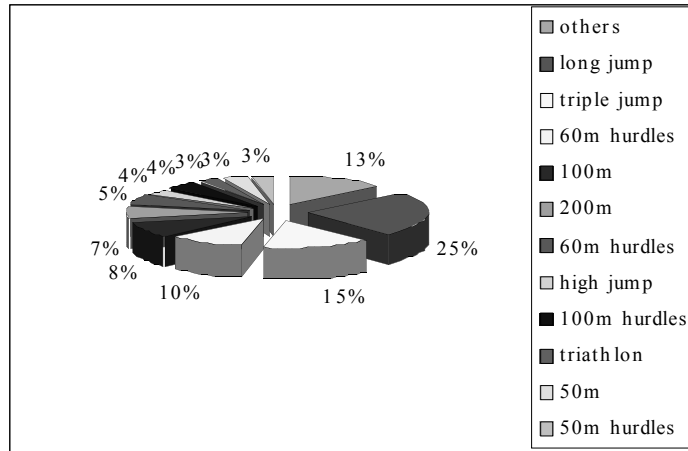


Figure 5. Graphical representation of the athletic events expressed as a percentage of 1989 female generation

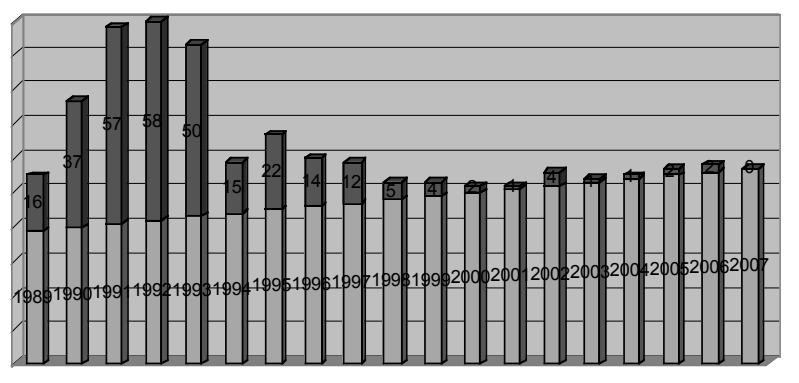
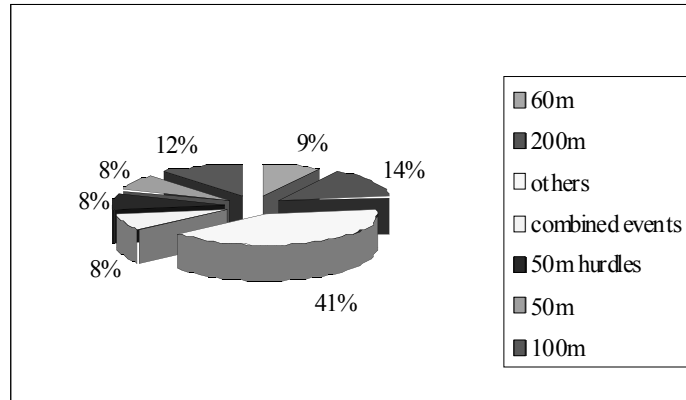


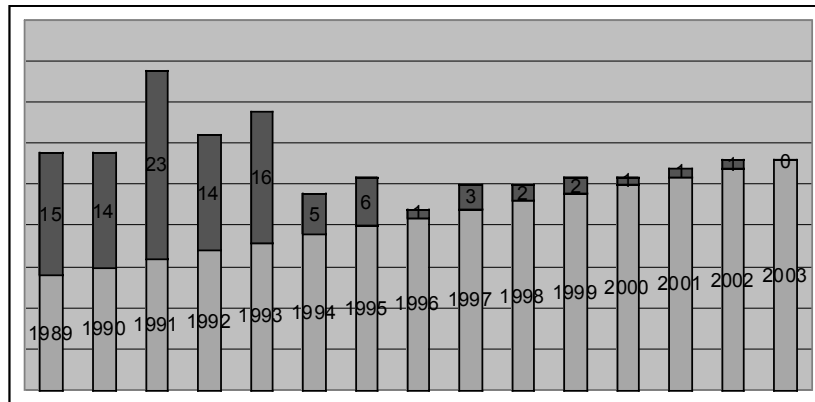
Figure 6. Total number of participations of 1989 female generation in competitive activity

1989 male generation is characterized by the predominance of run events like 200m -13%, 100m-11% and 400m-10% of total participations to the National Championships.(fig.7)



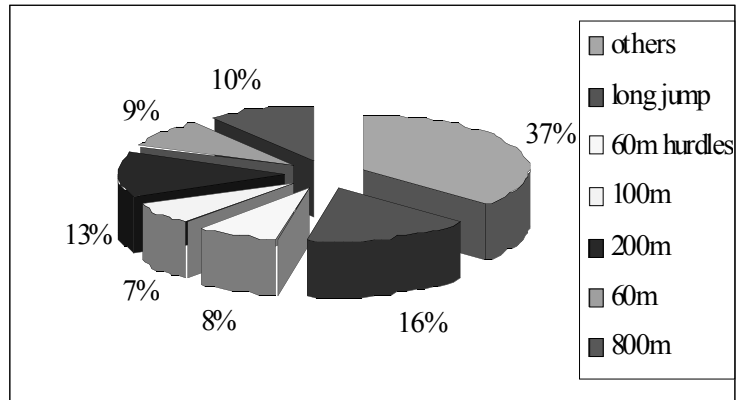
**Figure 7.** Graphical representation of the athletic events expressed as a percentage of 1989 male generation

Career longevity for 1989 male generation is relatively short (about 15 years), some athletes progressing to the Senior category. The year 2003 is the one when any athlete in this generation was not registered in the database of FRA. (fig. 8)

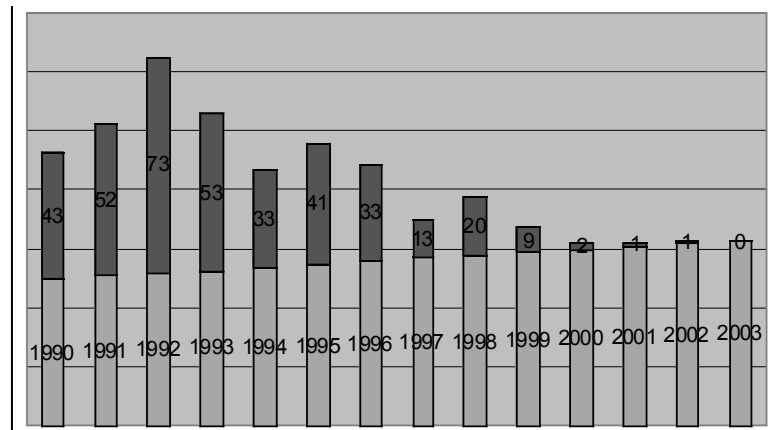


**Figure 8.** Total number of participations of 1989 male generation in competitive activity

**1990 Generation.** Regarding the 1990 female generation we notice a diversified athletic events evidence, the long jump event, with a participation of 16%, followed by the top holdings by run event 200m -13 %, 60m - 9% and 60mg - 8%.(fig.9)

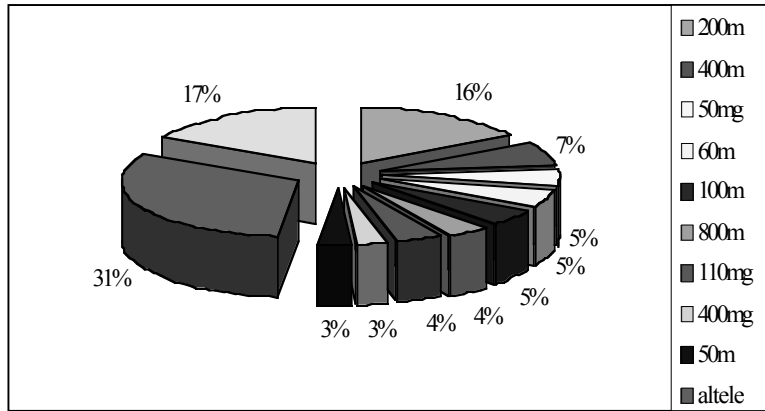


**Figure 9.** Graphical representation of the athletic events expressed as a percentage of 1990 female generation



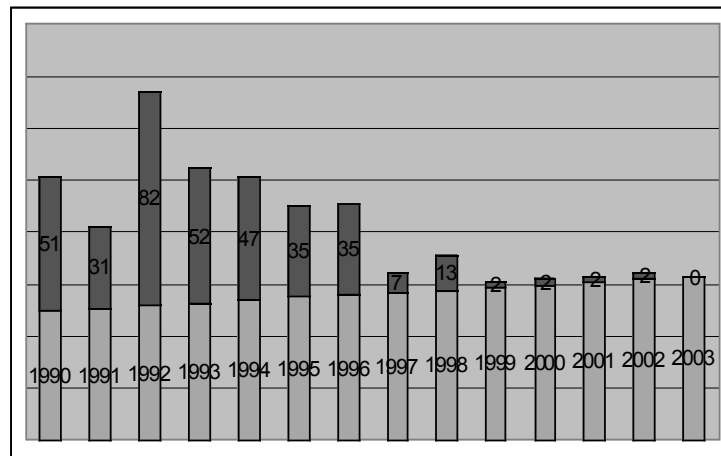
**Figure 10.** Total number of attendings of 1990 female generation to the athletic events

Similar to the 1990 generation of sports women, the athletes of this generation recorded the highest number of participations in both long jump events — 17% and 200m running — 16% (fig. 11)



**Figure 11.** Graphical representation of the athletic events expressed as a percentage of 1990 male generation

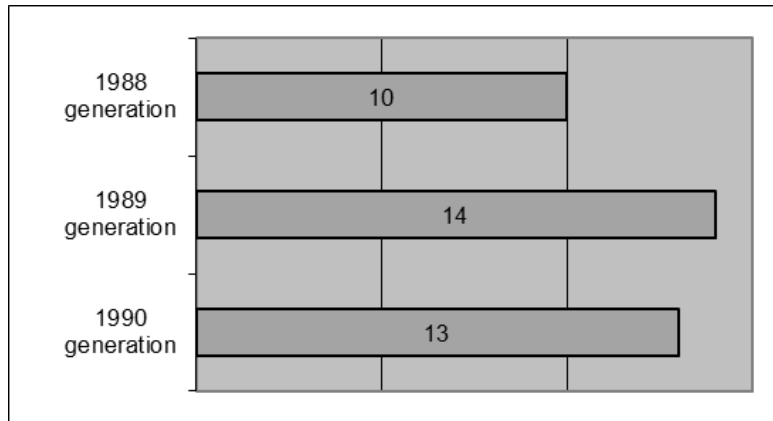
1992 year represented a pick given by the number of attendings in the national championships, being recorded 82 official results of the athletes of 1990's Generation, at Junior III category, later the athletes, little by little, abandoned the competitional activity, resulting a significant decrease in the number of attendings in official contests, as observable in fig. 12.



**Figure 12.** Total number of participations of 1990 male generation in competitive activity

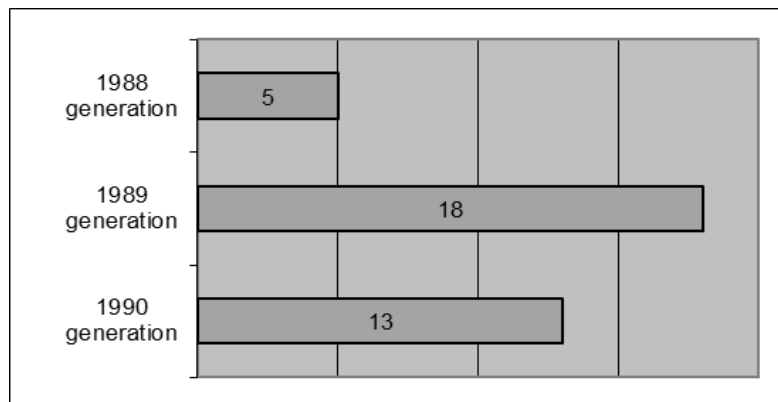


An overview of the 3 male athletes, related to the continuity of the performance activity, quantified in the maximum number of years as expression of the sportive career longevity, shows us an increase in the longevity for 1989 Generation compared to 1988 Generation, from age of 10 to age of 14. For 1990 Generation, the maximal longevity of the sportive career is of 13 years. (fig. 13)



**Figure 13.** Athletic career’s lenght for the observed male generations

Regarding the female athletes sportive career longevity for the girls of the observed generations, the 1989 Generation recorded the longest sportive career (18 years), meanwhile, for 1988 Generation, there are female athletes with recorded results within just 5 years after the launching year in the competitions. For 1990 Generation, the maximal longevity was just 13 years. (fig. 14)



**Figure 14.** Athletic career’s lenght for the observed female generations

**Conclusions.** Concluding this overall analysis of the 3 observed generations, we can state that the athletes selected according to the present criteria do not succeed to cover the needed talents, statement sustained by the fact that only a small percentage of the observed athletes had a representative and long sportive career and valuable official results also.

It has been observed that the present Romanian selection system, as opposed to the multitude of the athletic trials for which the future performant athletes are selected, has a limited number of tests, solely physic-related. These tests do not offer the specialists the possibility to select young people with favorable skills for high performance athletic activity and for competitive potential's capitalization within different athletic trials. As a proof, many athletes from the preliminary stage research have been standing aside after only 1 or 3 championship participations. One of the explanations would be that these were not properly selected / oriented or did not behavioral and bio motility-related respond to the type of athletic trial practiced.

In the light of the above-mentioned, we state that if the selection within the first forming athletic stage would use a wider array of trials and tests from the motility, psycho- motility and coordination skills, correlated to 9 to 12 age's particularities and specific activities for athletic orientation, then the quality of selection allows early discovery of elements with real aptitudes for a this athletic field, with a highly-broad range of competitive trials.

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**PRELIMINARY RESEARCH REGARDING  
THE IMPLEMENTATION OF SCIENTIFIC  
CONCEPTS IN THE MANAGEMENT  
OF UNIVERSITY SPORTS CLUBS**

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**Abstract**

*Science is an obvious and dominant phenomenon of the contemporary world in which we live, with a more and more important role in social development, found in all domains of human existence, including physical education and sports. Science constitutes a progress factor by means of its two essential notes, knowledge and prediction. They manifest as a systemic knowledge activity characterized by the fundamental demand to render reality based on a specialized activity based on systemic observations, experiments, new hypothesis and their verification. From this perspective, science constitutes the reflection of process essence, of their development objective laws.*

**Keywords:** *research, implementation, scientific, concept, resources, variables, management, university sport club*

### **Theoretical concepts that subsidize scientific research in sport management**

Using information from the specialized literature, we can say that science is a means for knowledge defined as a *structured investigation*, carried out in order to explain things, to be able to generalize and construct a theory, and that it is a process with four main fundamental characteristics: rationality, objectivity, completeness and prediction.

Scientific research is presented as *a set of activities and their results, conducted intentionally, deliberately, systemically and ordered, aiming at the accumulation and processing of data (information) in a field of reality, and at the use of the conclusions in order to achieve progress in the knowledge and practice of that field* (M. Epuran, 2005, p. 50). The author states that the approach is scientific if it is logically based, objective, unbiased, verified, controlled, observed, measured, logically interpreted, methodically organized, in other words, carried out in accordance with norms characteristic to science.

The knowledge domain of physical education and sports is growing and diversifying, constituting the theory of this science particularly structured, according to own laws and necessities. *Results of research in other disciplines (biochemistry, biomechanics, physiology, medicine, pedagogy, sociology, psychology, management, etc.) are unified and integrated in this knowledge system and are used within it for activity needs specific to the field.*

The authors of The Encyclopedia of Education and Sports (2002, p.237) consider that management in physical education and sports represents *“a branch of physical education and sports science that efficiently studies and applies design and organization, administration, management and leadership solutions in this field”*.

The influence of scientific activity is present today in all areas of social life, including physical education and sports, being characterized by the explosion of modern scientific research, by their orientation towards the transformation of nature and society, by the universal content, but also by the globalization of modern sci-

ence, by its entrance in all levels of society, operating changes in people's mentality.

*Physical education and sports, together with sports management, constitute an open system* in which management ensures the balance between social requirements and organizational objectives. This *system* consists of two categories of structures:

a) *the national system of physical education and sports*, characterized by specific variables (activities, organizations, interactions and purposes) which are influenced by a series of elements: the components of the economical and financial system, the specialized supersystem, the action of systems of the same rank, the action of the human resource;

b) *the organization's management system*, where the manager plays a decisive role.

Between the two systems, the *national system of physical education and sports* and *the organization's management system*, close complementarity and interdisciplinarity ties are formed.

*Sports are a globalizing factor*, a phenomenon, comprising millions of individuals from different cultures, a democratizing factor which interacts with the other subsystems of social life. *The sports organization is a factor of globalization*, with theoretical foundations, but also with its practice regarding managerial strategy, human resources, cultural orientation and organization, management development and performance.

### **Research resources**

Science is the primary factor for progress. By studying the objective laws governing the phenomena, science aims to foresee their conduct. The result of such research contributes in the creation of a database that helps the development and implementation of scientific methods in all fields, including sports management.

Sports management is a set of activities conducted in order to ensure the normal and efficient operation of the sports organization. Sports management specific activities and processes specific to sports organizations should be implemented in practice by people with delegated attributions by means of creative and

contextual application of scientific management concepts in specific system. The management processes as a creative action by the sports manager, exercise as foresight, organization, coordination, training and control functions, generate the structure, efficiency and performance for the subsystems in the sports structure's management system and of the organizational, decisional, informational and methodological-managerial components.

Public sports organization management emerged as a necessity for the development of the organizational segment, aimed at the improvement of efficiency and effectiveness of activities by orientation on the objectives and results (Al. Gore, 1993, A. Androniceanu, 2008, p. 17), on staff stimulation in order to obtain good performances while reducing costs and promoting the 3Es — economy, efficiency, effectiveness.

The management of public sports organizations is a component of sports management, whose conduct has as a fundamental objective the satisfaction of the social demand in the context of legislative induced influence and of a hierarchy determined through specific rules. The promoting of public performant management within sports organizations requires vision and clear, coherent, unitary leadership, and implies action in order to satisfy social needs in the context of normativity arisen from the specific normative framework, and can be realized only by continuous improvement of management processes and permanent improvement of managerial resource management.

In the specialized literature (A. Androniceanu, 2008, p. 346), it is estimated that *“concrete results in the process of reform cannot effectively be obtained only based on seniority, flair, experience, political orientation and a basic level of general education”*. From this point of view, promoting performant management within university sports organizations requires, first of all, the professionalization of management, reflected in the appropriate training of human resources, so that the elaboration and implementation of efficient organizational strategies is profitable in the context of an adequate organizational environment.

The promotion of performant management within university



sports structures *requires organizational development*, understood as a complex of design activities and the implementation of improvement measures regarding vision and management based on strategy, the organization's management system components and others in order to improve results in the context of rational resource usage. E. Burduş (2005, p. 543) outlines several plans for organizational development:

- a) the use of appropriate methods and techniques specific to modern management in the specific context;
- b) implementation of change in people's behavior, as a primary orientation of organizational management;
- c) the identification of organizational management components suitable for change and development and the implementation of efficient strategies.

Other recognized authors (O. Nicolescu, 2005, p. 52-59, A. Androniceanu, 2008, p. 365-366, I.I. Lador, N. Mihăilescu, 2008, p. 43-44) consider that *the promotion of management based on knowledge* is an improvement solution, able to ensure the development of knowledge and use of knowledge efficiently and effectively. All the more, since there is a lack of knowledge in sports management, an unclear definition of types of knowledge and of means by which they can be acquired, updated and improved.

A. Androniceanu (2004, 2008, p. 367-368, I. I. Lador, N. Mihăilescu, 2008, p. 44-46) consider that *promoting management based on performance* is a good orientation and activity improvement method, based on two premises:

1. the need to satisfy the social demand, taking into consideration the competitive conditions expressed through economy, efficiency and effectiveness (*„the three Es”*);
2. the satisfaction, at the highest level possible, of social demands in the context of managing and ensuring the three Es.

Promoting of management based on performance requires de definition of performance in performance indicating term and the elaboration of application methodology in the context of the sports organization's particularities and the system of which it is a part.

Organizational improvement and promoting of performant

management also require the superior capitalization of two components specific to modern management: *the methodological-managerial tools and the management based on strategy*. Performant management in university sports structures implies the use of management by objectives as a modern approach meant to ensure a proper evaluation of organizational performances. Setting goals in sports organizations and their structural components, as well as means of achieving them, can determine a more efficient organization and use of resources.

Promoting management based on objectives:

a) constitutes a safe evaluation method for organizational performances, based on indicators;

b) enforces a management based on strategy at the organizational level and within its component structures.

c) requires a complex, systemic approach, correlated with other management methods: management by budgets, management by results, management by projects;

d) activates concepts such as strategic management, strategic segmentation and strategic alliance.

The performance of a university sports organization is decisively influenced by the level of implementation of scientific management tools in the organizational management.

The pertinence and applicability of decisions in real time, the monitoring of their implementation, in the context of an often hostile competitive environment, determines the need for a set of appropriate methods and techniques that will give the manager the possibility of a correct answer in the organization he leads.

### **Research variables**

Research in the field of physical education and sports, including that which targets the complementarity and interdisciplinarity components, like in the case of sports management, targets the methods by which individuals and phenomena change certain characteristics under the influence of human actions. *The variables are quantities or measures susceptible to changing their value one against the other, which remain constant (DEX, 2009,*

p. 1183) or „any attribute, behavior, trait or attribute that can change its value from case to case or depending on time” (M. Epuran, 2005, p. 163).

In research specific to sports management, a branch of physical education and sports (A. Nicu, coord., 2002, p. 237), we have taken into consideration the following categories of variables: *exploratory, control and external* (S. Chelcea, 2004, p. 64). *Exploratory variables are composed of causal factors introduced by us in research, respectively the independent variables and their consequences with changing values - dependent variables. Control variables are those which validate the influence relationship between independent variables and dependent ones*, found within the thesis as evaluation tools. We have considered all these factors as external variables, outside the exploratory and control ones that could influence the results, whose influence we have tried to eliminate.

As mentioned in the paper, management specific to public university sports clubs has two components: *one induced that resides from the components specific to the public component*, and another one *that is suitable to change under the influence of organization management*. In these conditions, the variables which characterize the work hypotheses are the causal, independent variables, which are thought to have a direct influence on dependent variables and causal, dependent variables, respectively the effect generated as a result of the cause. We have considered that there can be two or more causal variables with the same consequences regarding the effect, dependent, variable, if certain conditions are met (S. Chelcea, 1982, p. 53):

1. *The existence of a antecedence relationship between the independent variable and the dependent one, as cause always precedes the effect;*
2. *There must not be another cause that explains the modification of the dependent variable, other than the action of the independent variable.*

In the context of characteristics of sports organization management in the public domain, independent variables come from the

following directions:

a) The capitalization of some components of the methodological-managerial subsystem in a situational and organizational context: *SWOT analysis, VRIO analysis, PERT/CPM, GANTT, etc.*;

b) *The promotion of management through objectives both as a means of modern management and as a complex management method that requires objectives, budgets, results;*

c) The application of concepts and tools specific to management based on strategy, taking into consideration the particularities of club activity, with reference to *the strategic analysis, the strategic vision and strategic segmentation.*

The dependent variable, of type consequence of the actions of independent variables, is the one suggested by the theme of our thesis: „*Promoting performant management within university sports clubs*”. The argument for the achievement of the effect is the results obtained by the indicators used to evaluate the activity of university sports clubs, in the context of using the sports unit’s resources more efficiently.

The aspects that facilitated the elaboration of hypotheses were the following:

1. *Knowledge development*, done during thoroughgoing study done during doctoral school, as well as documentation done for the theoretical substantiation of the thesis, with reference to the theory of science for sports and physical education, to the theory of scientific management and to other complementary sciences for the field of physical education and sports;

2. *The management experience* accumulated as a manager of the Universitatea Sports Club Arad, which, along with *knowledge enrichment*, have allowed me to have insight regarding the relations between facts, phenomena and processes specific to the organization and management of a sports structure of this kind;

3. I have also used *analogy* with situations from other structures or other fields, with similar characteristics, which I tried to transfer through *extrapolation* to the actual club situation and to the research regarding the theme of the thesis.

4. Research hypotheses

In the scientific research specific to the field of physical education and sports, including the one specific to sports management, the following hypothesis can be considered:

- „*the statement of a causal relationship in a way that allows empirical verification*”(Th. Caplow, 1970, p. 119);

- „*a statement with probability characteristics about the essence, the interconditioning and causality of facts, processes and socio-human phenomena*” (S. Chelcea, 2004, p.99);

- „*presumption, a temporary explanation, with which we infer on a relationship between phenomena, on their causal bonds, on mechanism and their structure*” (M. Epuran, 2005, p.99).

Starting from the idea of empiricism as a theory for scientific knowledge, according to which the genuine information must be obtained through verifiable means (DEX, 2009, p. 352). The work hypotheses for the thesis aim at correlations of type cause-effect between the variables found in each of them and require the following conditions:

1. *External correlation*, meaning accordance „with the empirical base from which it has arisen” (M. Epuran, 2005, p. 10);

2. *Testability*, so that the verification of the hypothesis is done based on science;

3. *Internal correlation*, which requires that the hypothesis does not contain contradicting elements (logical thinking) or in contradiction with laws and theories that are considered true.

### **Conclusions**

*Scientific research in physical activity* requires well defined methods that are applied in a systemic vision in the development processes, and is defined by five characteristics (R. J. Thomas, K. J. Nelson, 1996, p. 5):

1. *systemic*: the resolution of problems is done by identifying and establishing variables and is followed by research design, which tests the relationships between these variables. The data is then gathered and analyzed to allow the evaluation of problems and of hypotheses;

2. *logical*: the examining of procedures used throughout the

research allows researchers to correctly evaluate conclusions;

3. *empirical*: the researcher correlates data on which decisions will be based;

4. *reductionist*: research requires the gathering of a large amount of data with individual character, which is then used to establish the more general relationships;

5. *reproducible*: the research process is recorded, allowing the resuming of research for retesting what has been discovered or in order to continue research based on previous data.

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## EXPERIMENTAL STUDY REGARDING THE INTRODUCTION OF THE PSYCHOLOGICAL PROFILE IN THE INITIAL SELECTION FOR SPORT SHOOTING

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### Abstract

*The aim of our study is to better the initial selection process in performance target shooting, considering the psychological profile – in relation to the somato-functional side- as a decisive factor in obtaining performance. **Methods:** the study was carried out at the Arad Municipal Sporting Club (MSC) in two stages. In the first one 148 students filled out the Cattell 16FP personality test in the presence of an authorized psychologist and have performed tests specific to the initial selection (TSSI): balance test (TE), spatial coordination test (TCS), skill and precision test (TIP). Two groups were set up: group A (GR. A, N=18 subjects, 7 girls, 11 boys, Age average  $13.77 \pm 0.42$  years) which scored above average in five categories (C, E, F, H, Q) and had an express desire to practice target shooting; and group B (GR. B, N=18 subjects, 9 girls, 9 boys, age average  $13.6 \pm 0.38$  years) with a point average above specific test score results ( $M=3$ ) and an express desire to practice target shooting. In the second stage the two groups have performed the shooting trial (PF) in the target range. **Results:** our study produced no evidence towards a positive and significant relationship between shooting range subject performance and the proposed psychological profile.*

**Keywords:** psychological test, balance test, skill and precision test, spatial coordination test, emotional balance.

### Premises

The initial selection process in sport shooting raises at least two important aspects: on one hand, the great number of subjects that abandon shooting range practice after the first years and on the other the difficulty found in setting up a reliable, specific, battery of tests. The data provided by the sport shooting department of C.S.M Arad provides an image for the former aspect, thus, out of a total of 747 students tested during 2007-2008, 47 subjects have been selected (intermediary selection) and only 29 remained after 3 years of training. As for the TSSIs utilized at CSM Arad, certain clarifications must be made.

The initial selection process — regardless of the type of sport discussed - is made according to 4 criterions<sup>2,6</sup>: medical, mathematical, motric and psychological. General health status is an intrinsic condition in sport shooting as opposed to the motric qualities, that define the professional athlete in the sport, which are perfectible<sup>3,9,10</sup> (endurance and static equilibrium force, speed in dynamic tests). It has to be stated though that some neuro-psychical aspects (a strongly balanced and mobile nervous system type, very good neuromuscular coordination and a developed fundamental nervous process system registered with those taking part in dynamic tests) have not reached their full maturity at the age of 13-14 in order to be considered initial selection criterions.

The testing process<sup>1,7,8</sup> consists of an: **equilibrium test** (balancing on one foot while time is being measured), **spatial coordination test** (the subject starts advancing towards a tennis ball suspended at shoulder level from a 2 m distance, with the right hand extended at shoulder level and the left eye covered by the left hand — the other way around for lefties-; the subject stops when he/she considers to be close enough to hit the ball by extending their index finger), **skill and precision test** (the subject has to throw a disc with a 15cm inner diameter towards a pin 2ms away) and **firing 5 shots from a standing position** (the rifle being leant against a supporting structure).

After the 4 trials it can be concluded that only the last one represents a specific sport shooting test, the other ones being

exercises that may make up a battery of tests for other sport branches. In other words, in relation with other sports, sport shooting forwards a relatively simple technical structure, however one that necessitates the precision and accuracy of the perfect movement<sup>4</sup>.

The training consists of repeating the same movements until they are performed flawlessly and this implies exceptional physical and psychological features, emphasized by trainers with exceptional qualities (Tao Luna): perseverance, relaxation, courage and enthusiasm and last but not least a great amount of self-confidence<sup>11,12</sup>. In the process of optimizing the selection process, our study aims to identify the possibility of a significant relationship between some personality traits and sport shooting during the initial selection process.

### **Methodology**

#### **The subjects**

148 subjects have taken part in the study (N=148, 94 males, 54 females, age  $13.28 \pm 0.49$  years). During the first stage they have undergone TSSI and have been submitted the Cattell 16FP personality test. In the second stage two distinct groups have been configured based around the following criteria: GROUP A (above average test results in 5 items - C,E,F,H,Q- and the expressly manifested desire to practice sport shooting; N=18 subjects, 7 females, 11 males, age average  $13.77 \pm 0.42$  years) and GROUP B (above average specific test results ( $M_{TSSI}=3$ ) and an express desire to practice sport shooting; N=18 subjects, 9 females, 9 boys, Age average =  $13.16 \pm 0.38$  years). In the second phase the two groups have taken the practical shooting test in the firing range. The study has been approved by the ethical committee of CCAF, trainers and members of the CSM Arad sport shooting division.

#### **Study Design**

The Cattell 16FP personality test has been applied in the presence of a chartered psychologist, also responsible for centralizing,

processing and interpreting the data. Out of the 16 items we have further analysed the following ones: C (emotional balance), E (self-confidence), F (communicational skills), H (trust manifested in own person) and Q (calmness). The shooting trial (PF) consisted of firing the gun 5 times from a standing position; marking and evaluation are made with the aid of a transparent template which is overlaid on the group table, with grading ranging from 10 points (weak) to 50 points (excellent). The selection standard (SS) is 25 points. For the TSSI the grading ranges from 1 point (weak) to 4 point (excellent) and the SS is 3 points.

The express desire to practice sport shooting, an important motivational factor in our opinion, influenced the setup of the two groups in the sense that subjects who have registered a low grading in the two tests (TSSI and Cattell 16FP) during the first stage are to be found in groups A and B and represent 11.11% (2 subjects for each group). The SPSS program (version 17.0) has been used for calculating and analysing the results.

**Results**

The results obtained by the subjects from the two groups are included in table 1 and 2.

**Table 1.** The general average and standard deviation for Cattell 16FP and PF. Group A

**Group A**

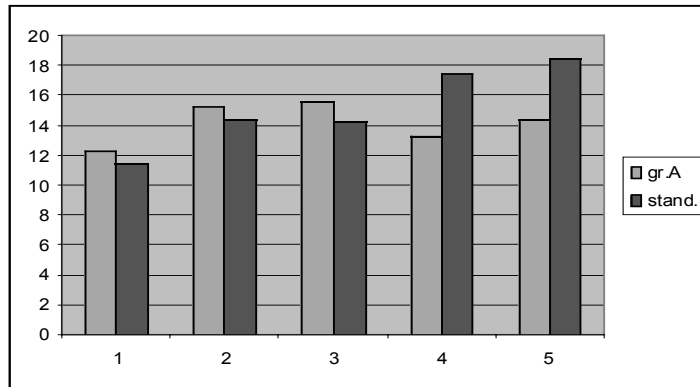
	<i>SUB.</i> <i>(nr.)</i>	<i>AGE.</i> <i>(years)</i>	<i>Cattel 16PF</i>				<i>PF.</i> <i>(pct)</i>
			<i>C(pct)</i>	<i>E(pct)</i>	<i>F(pct)</i>	<i>H(pct)</i>	<i>Q(pct)</i>
N	18(7E,11m)						
M		13.77	12.27	15.38	15.61	13,22	14,44
SD		0.42	2.96	2.95	3.55	3,15	3,32

**Table 2.** The general average and standard deviation for TSSI and PF. Group B

**B**

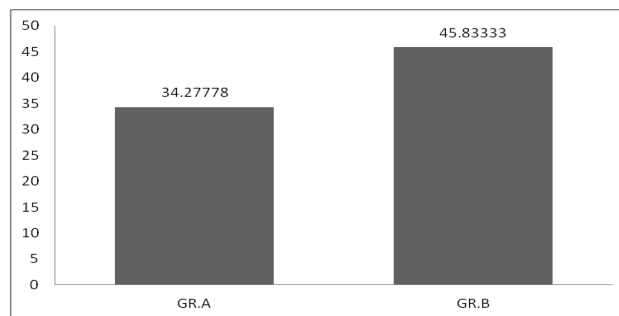
	<i>SUB.</i> <i>(nr.)</i>	<i>Age.</i> <i>(years)</i>	<i>TSSI</i> <i>(pct)</i>	<i>PF.</i> <i>(pct)</i>
N	18(9f,9m)			
M		13.16	3.05555	45.83333
SD		0.38	1.10996	5.617724

From a psychological profile standpoint Group A (Table 1) is emotionally stable (M=12, 27 in relation to the questionnaire’s standard of 11-12) — C factor; proves a good amount of self-assurance (M=15,61 compared to the questionnaire standard of 12-17)- E factor; is an open, communicative group (M=15,61 related to the questionnaire reference standard of 12-17)- F factor; as for spontaneity, the group’s daringness is situated within the standard average (M=13,22 for the group compared to a 14-21 standard average) — H factor; and a relatively high Q factor (calmness-serenity), the group averaging M= 14,44, can be explained through the nature of the experience, the age of the subjects, fear from the unknown. These aspects are represented in fig.1.



**Fig.1** Graphic representation of the C,E,F,H,Q average values in relation to measurement standard average.

As for the results registered in TSSI, Group B’s setup respects the club selection criterion (M=3.05±1.10) as shown in table 2.



**Fig.2** Graphic representation of the PF grade average for the two groups

During the second stage, both groups have fired their weapons in the shooting range after receiving guidance. Figure 2 represents the results for the two groups.

### **Discussion**

The personality test data for group A, considered a selection criterion for this group, describes the following psychological profile: emotional stability, self-assurance, communicativeness, relative calm, i.e. the psychological profile suggested by Xie Qianqiao (Shanghai Sport Science Institut)

We have calculated the correlation coefficient ( $r$ ) to determine whether there is a relationship between the 5 personality traits and shooting performance, and if present, is it significant or not. The results obtained ( $r_C= 0.039075$ ,  $r_E= -0.09996$ ,  $r_F= 0.171393$ ,  $r_H= -0.182$ ,  $r_Q= -0.02525$ ) show that there is no significant and positive relationship between the 5 personality factors in shooting performance. In PF, the average ( $M_{PF}=34.27$ points) for Group A is above the selection standard ( $M_{SS}=25$ points). Standard deviation values, for both the 5 items as well as for the firing trial, suggest a less homogenous sample (Group A), resulted from the initial selection process, compared to Group B and using as a reference the psychological criterion. Calculating the correlation coefficient ( $r$ ) between TSSI and PF for Group B we can see that there is no positive and significant connection ( $r=-0.08447$ ) between the two variables, meaning the subjects with better results at specific trials have not performed at the same level during the shooting trials. Nonetheless, results registered by Group B in the firing range are better than those registered by Group A (fig. 2).

### **Conclusions**

Based on the results obtained we have proved that sport shooting performance during the initial selection process is not influenced by the psychological profile and the results obtained during specific trials, although such a relation is suggested by the field specific literature. We can assume that the psychological factors analysed in the study are not yet fully stable at the age of 13-14,

the registered scores only showing trends. Anyway, achieving a level of great performance in sport shooting requires long years of practice aiming for perfection and this is not possible without certain psychic qualities: perseverance, self-assurance, calm and relaxation. Although there is no static liaison between the specific tests used by CSM Arad trainers during the initial selection process and shooting performance, the results obtained by Group B are better in comparison to those registered by Group A. There is an argument supporting the continued usage of these tests during the initial selection process. However further research is necessary to define a battery of tests specific for sport shooting that would also allow for a decrease in the number of those abandoning fire range activity the first 2-3 years after being selected.

#### **Acknowledgments**

We would like to thank all those taking part in our study.

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**EFFORT CHARACTERISTICS OF MALE  
ARTISTIC GYMNASTICS - CATEGORY JUNIOR  
IV LEVEL 1 AND LEVEL 2**

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**Abstract**

*All the positive physiological and structural transformations in the athletes' body by practicing a sport, is due to body adaptations to physical and mental efforts to which they are subjected during exercise and are directly proportional to its intensity and volume, as well as with the frequency of training.*

*Achieving high performance in any area of human activity, by default in gymnastics, are conditioned to undertake great efforts, characterized by a high level of training effort parameters such as volume, intensity, density and complexity.*

**Keywords:** *artistic gymnastics, exercise, effort, physical training, technical training, model, modeling.*

### **Introduction**

The effort represents the physical activity planned, structured, repetitive, geared to a specific purpose; whole body movements, systematically executed.

Exercise is a functional overload that causes a change in the body's homeostasis, in order to cover the needs of increased metabolism in muscle activity.

According to the explanatory dictionary of the Romanian language (1998) relating to the request, noted that it "shall mean a physical process which produce large deformations and stresses in a solid body".

Extrapolating from the sports activity and physical exercise, requiring a physical effort caused (tension) to produce Adaptive changes of morpho-functional and emotional in close dependence on the nature of the request.

What sports require effort and trying to destabilize body homeostasis, causing the body to the organs, functions and systems, Adaptive reactions. The level of adaptation of the ability is reflected in the athlete's performance, in the sense that a good and fast adaptation of organism to the special requirements of sports practiced in the branch, resulting in higher performance.

Sports training, adapting to the changes caused by the amount representing the exercise repeated systematically "(T.O. Bompa, 2001). All the positive physiological and structural transformations in the athletes' body by practicing a sport, is due to body adaptations to physical and mental efforts to which they are subjected during exercise and are directly proportional to its intensity and volume, as well as with the frequency of training.

Achieving high performance in any area of human activity, by default in gymnastics, are conditioned to undertake great efforts, characterized by a high level of training effort parameters such as volume, intensity, density and complexity.

The volume represents the effort of preparation and it's premise to achieve a higher physical level, both technically and tactically and psychologically a good balance.

The volume of training in gymnastics is the amount of work

done, working time, number of devices to which the preparation is carried out, the number of items or the partial or complete exercises. The sheer volume of training contributes to learning and perfecting the technique of exercises and gym.

If years ago, is considered sufficient to perform 4-6 weekly workouts, today the question arises of at least 2 daily workouts, and in some periods of training (learning tasks, training camps etc.) just 3 workouts per day.

Intensity represents the qualitative component of the training and effort is the amount of work done per unit time. The more an athlete makes more effort per unit time the higher intensity. The intensity is a function of the strength of nerve impulses of availing the athlete in the grounding. The strength of a stimulus (element, exercise) depends on the load, speed and variation interval or pause between repetitions.

The effort represents the density ratio between the time of the stimulus and the rest on training structure or the frequency with which an athlete respond to a number of stimuli per unit time. Density refers to the relationship expressed in time of effort and recovery phases of the body. A proper density provides effective training and prevents entry into a State of fatigue or exhaustion, critical to achieving an optimum ratio between training and recovery.

The complexity of the effort is given by the number of motor actions carried out simultaneously during an activity and the originality of typological elements configuration (the driving laws, energy substrate diversity number of body systems involved and the number of approvals and smoothness).

The complexity of skills by requiring coordination can increase the intensity of training. A skill or a complex element of technique can create learning problems and therefore request additional muscle, especially when the neuro-muscular coordination is lower.

Specific stimuli (exercise) is another parameter to the effort which is determined by the characteristics of the stimulus;

- body systems caused reactions;

- psychological qualities of the athlete;
- the athlete's age;
- level of preparation;
- location of macrocicului structures in stimuli;
- ambient conditions, etc.

The duration of the stimulus, while the stimulus. Act is singular or in series in establishments of the workout.

The amplitude (or variability) of stimulus, is the numeric values of the relative duration and number of stimuli during a workout structures (Example: training in the morning:  $2 \times 5 \times 50 = 2 \times 5 \times$  series reel 50 repetition; afternoon training;  $2 \times 5 \times 40 = 2 \times 5$  series reel  $\times 40$  repetitions, which means that morning were executed in this example, 500 iterations and after meals or run 400 iterations the difference between them representing the magnitude of the stimulus, in our case 100).

The frequency of the stimulus, is the number of units of the training lessons per day, per micro cycles, and macrocicluri series.

All the above effort parameters listed have their role and importance in the process of preparation, we believe, however, that volume and intensity are through their correct combination, the solution to the optimization of stimulus for achieving goals.

A great deal of effort, combined with ever-increasing intensity, but wisely established, leading to a high level of adaptation, and that results in obtaining high performances.

The effort features the floor exercises consists of acrobatic elements prevalent manner, combined with other elements such as gymnastic and parts of strength and balance, mobility movements, sitting on your hands and choreographic combinations, constituting a harmonious whole and upbeat, which runs over the whole surface of the ground "(12 m x 12 m), code (the men's artistic gymnastics SCORE Edition, 2013). In terms of the effort which must be made to carry out this exercise, the focus is moving towards dynamic elements of the Moose and the balance (dynamic effort), or flipping, flipping back, before straightening on rolling back in her head and sitting on your hands. Our research led us to a finding that the competition at the end of the year (at

most gymnasts), heart rate does not exceed about 150/160 key-strokes per minute, which demonstrates that the effort falls within the aerobic-anaerobic exertion.

The effort features goat dishes. The effort must be carried out over the course of about 15-18 seconds and F.C. (heart rate) of about 180-210 beats per minute being predominantly anaerobic effort alactacid and lactacid. A high intensity exercise, because the effort is continuously, without breaks. The amount of effort in training lessons at the gym so you need to be particularly large, with many repetitions of circles linked in series of 20-30 circles and approximately 12-15 series, the weekly cycle, bringing the total to about 1000-1200 items.

The effort features rings. The effort has the characteristic mixed aerobic-anaerobic exertion lactacid, the main means of influencing the exercise parameters (intensity-volume), and is even repeated a number of times as the balances at every climb on camera. We believe that a number of about 10-12 balances and approximately 8-12 ascents on the device, in a training lesson from this camera for about 30-45 minutes and 3 workouts per week is enough at this age group for learning quickly and correctly, the exercise provided for this category of the jumping effort features classification.

The effort of jumping with the gymnasts flip by sitting on their hands, is composed of the effort in the jumping phases with a focus on the race in , beating of the feet, hands, beating the flight and landing (great effort at disposal for safe stopping at landing).

So, to sum up, affirm that a very good race, ensure you a good beating of the feet, which ensures an optimal, which I flight, flight II prepares a very tall (with the possibility of different elements that increase the difficulty), which ensures a long, safe landing and halted, however a note assuring the greatest.

The characteristics of parallel bars efforts. The joint effort is the predominant feature, alactacid anaerobic and anaerobic lactacid, execution by the children of this age of the elements mentioned above, requesting from them, a particularly intense effort and sustained.

Taking into account the morph-functional of gymnasts aged 6-

8 years, and the fact that the rupture may occur in parallel of the palmar skin, we consider that approximately 60-70 balances in sitting on hands and about 30 îndreptări are sufficient to 3 weekly workouts, with about 45 minutes of work to the device.

The effort features the horizontal bars. The effort to execute the exercise, the predominant feature has mixed anaerobic exercise and anaerobic effort lactacid alactacid, held over the course of about 10-12 seconds, with an average intensity and volume.

During training, it is recommended that a separate approach to the elements of the exercise, and their practice, to be made by a large number of iterations (large volume), about 8-10 repetitions at every climb on camera, with a number of 6-8 weekly on the item, in a working time of about 45 minutes per workout and with 3 workouts per week.

### **The purpose and tasks of the research**

The research undertaken for the elaboration of this paper aims to identify lines of action in order to elaborate a strategy for selection for men's artistic gymnastics at the junior level.

The other purpose is related to the determination of the age of beginning the work effort of training specialized in men's artistic gymnastics and eventual relationship with the selection system adopted.

In this sense, our approach tasks can be found in:

- an overview of the current content used nationally in the male selection system;
- comparative analysis of this system with the recommendations of the Romanian Federation of gymnastics;
- identifying the elements of the strategy selection in children 6-8 years to optimize the selection system;
- highlighting the effort indicators male artistic gymnastics;
- determination of the amount of effort made by small-scale gymnasts, participants in the research.

### **Methods used**

Depending on the purpose of the research, have used the following methods:

- For documentation: historical method, the method the spe-

cialized bibliography study that was done to this theoretical work.

The studied materials also helped us to formulate ideas and reflections which I clarified the issues and uncertainties that arose during the experiment and the drafting of the thesis;

- For data collection: the monograph, observation, measurement and testing, the investigation through interview and questionnaire, call. Observation method was carried out throughout the research activity through both spontaneous and purposeful observations. Events and actions which have been recorded in the worksheets that were designed and used in the composition of this work;

- To verify the hypothesis: the method of the experiment which provided a basic objective which could argue, from the scientific point of view, the answers to the assumptions made in this research;

- For the processing of data collected: statistical and mathematical method by using descriptive primary statistics (calculation of the arithmetic mean, standard deviation, and coefficient of variance), allowed the analysis and comparison of the results obtained at the initial and final testing of the experimental and control groups during the experiment;

- Analysis of results: *intabelarea* and method for graphic data presentation allows the quick and obvious differences between the results obtained from the research.

### **Contributions regarding the contents of the selection for the junior team IV level 1 and 2**

On the basis of its own concept, presented in the strategy, I have proposed a set of control that I have applied for over the years junior team IV level 1 and 2 in Arad, which is actually part of the research for the preparation of the present paper.

1. Long jump on the place
2. Jumping up and down on the lid of the crate/30'
3. Removal of the trunk and legs of dorsal recumbent
4. Hung out with her arms folded at double-digit horizontal bar
5. Traveling in circles in support on the ground face down

6. Trunk bending-extensions of sitting tilted to upper arms
7. Climbing rope
8. Static equilibrium-sitting tips with my eyes closed.

### **Interpretation of data**

The results obtained from the proposed control samples were ordered and processed using methods of primary statistics.

The graphs made based on the values of the results obtained from the control samples from age 6 to age 8 years shows a steady growth of these values, together with increasing age, with a very high rate of progress to control samples showing muscle strength.

The coefficient of variance computed presents us values between 0,4 (samples in the support circle lying and climbing rope-at the age of 6 years) and 7.9 (sample hung maintained at Hula-all at the age of 6 years), which is a statistical variability accepted as being very small.

Analysis of the absolute values of this indicator reveals an increase in the variability of the average data from age 6 to 8 years of age, except sample hung maintained at horizontal bar, in this case obtaining a reduction in the variability of environments.

### **Conclusions**

Formation, strengthening and perfecting the skills specific to male gymnastics, is through a large volume of repetition of elements, legărilor, and combinations of exercises, and the main methodological feature of physical training in order to ensure the support required is: “creating functional surplus compared to the minimum requirement of mouve gym” (V. Grigore, 2001), which gives stability and safety performance.

Particularly high technical level, which was reached at the present time in artistic gymnastics male, is primarily due to the greatest extent, the increasing of efforts during training.

Increasing the number of training (per day, microperiod, mezo-ciclu and macroperiod), increasing the number of hours of training in your workout, increase the volume, intensity, density and complexity of the effort, are just some of the changes and the



accumulation of modern training in gymnastics.

Along with these, it is remarked, the improvement of methods and means of training, equipment and materials, apparatus competition, as well as supporting the training apparatus in ideal conditions.

Knowing that the effort in gymnastics is a neuromuscular-type effort (amid a endocrino-metabolic substrate for support) and neuropsychological effort (a. Dalipe, 1970), we consider the global effort (throughout the duration of the training), as mainly an aerobic environment which consists of anaerobic and anaerobic alactacide efforts lactacide (items, legărilor executions, combinațiile or and exercises taken separately).

Attainment of a high level of effort, the parameters of the higher classes (the Ith and Masters), is conditional upon the preparation and effort from the lowest category of classification.

Learned nonuse at early ages, with sub-maximal efforts, represents the certainty of future maximum efforts and supra-maximal from higher categories.

Gymnasts from training for beginner and performance groups, must be aimed at overcoming the performance and achievement of gymnast the most valuable model, characterized by very high capacity of effort, the optimum in terms of morpho-functional, mentally balanced and eager to make performance.

Number of practice sessions for a week, at these ages, represents approximately 50% of the volume this indicator at the level of high performance.

Number of workouts per week gradually increases with age, the level of training and the program he would never take money from the school. If at the age of 6 years there are two days off a week, it is subsequently will reach a volume of 10 to 12 workouts per week.

Your workout time increases gradually, in proportion to the effort he would never take money from. So if at the age of 6 years being an average of 70 minutes, at the level of high performance it by touching an average of 210 minutes.

Number of weeks in a year of preparation for these ages, rep-

resents an indicator of effort dynamics in artistic gymnastics very close to that found in the high performance. At the highest level this indicator reaches, on average, at 49 weeks.

The volume of this at drill is an indicator very important, in view of the fact that, its reporting to the other indicators, it gives a very accurate picture of the assimilation capacity, he would never take money from progress. At the same time this indicator provides information relating to the interest, he would never take money from desire to raise songwriting sports.

Total time spent in the training camp is an indicator of the dynamics effort which objectiveaza a plus of effort from other periods, in view of the fact that in the training camp there are no other concerns (and in particular those of a school) outside the preparation process.

Number of contests are the force dynamics indicator is furthest from the one of the high performance. If at the age of 6 years we have 2 competitions per year, it has reached a number 6 at the age of 8 years and more than 15 at the level of high performance. From the point of view of official competitions this indicator can be found only from the age of 8 years ago, when small gymnasts may submit exercises to full length all the appliances (or just a few of them) in accordance with the rules of competition.

Total Time of non-specific training should be added to the total preparation. This indicator shows the volume allocated to non-specific effort, additional essential process of preparing, especially at these ages, with a maximum of time spent at the age of 6 years. With increasing level of performance this indicator is considerably reduces the volume.

Analysis of the data shows that effort density at ages subject to research is greater than at sea level performance - reported to the total preparation. In view of the proven, we can say that dynamic hypothesis according to which effort to ages 6 - 8 years (job start competitive) becomes factor for the selection for the next generation of gymnasts, are hereby confirmed.

So programming process of preparing small gymnasts will start level dynamics indicators effort demonstrate to be determi-

nants for achieving a team of artistic gymnastics competitive. 9.837 WHICH fail to obtain the values of indicators effort dynamics determine, they managed to obtain performance sports exception.

Variation of the values of indicators effort dynamics to the appliances is in accordance with the characteristics small gymnasts age and the difficulty of exercises to these appliances.

The total number of elements in a training session to bar finals, represents effort dynamics indicator with the highest rate of progress of all the appliances, it arriving at the age of 8 years to be four times higher than at the age of 6 years.

It has to be stressed particular case of Rebound, several indicators of effort dynamics being suprapusi execution thanks to this appliance. Slowest progress can be found at O-rings, the specificity of this appliance is in contradiction with the characteristics of the age of small gymnasts.

Prevailing in the process of training from the age of 6 years are acrobatics and high diving along with the goat (cal) and parallel to each other. Subsequently, from the age of 7 years, the process of preparing equilibrate by tackling all the apparatus of the contest. At the age of eight, the indicators effort dynamics triples in the case of most appliances (with the exception of rings) in start-up of competitive conditions.

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## JU-JITSU AS A METHOD OF PSYCHO-PHYSICAL TRAINING IN THE CONTEMPORARY AGE

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### **Abstract**

*The present work is intended to be a proposal regarding the approaching of pshycho-physical training in the our contemporary times, resorting to the fascinating world of martial arts.*

*With its roots from the darkness of the Japanese history, Ju-jitsu as a martial art influenced the way of living and training of the famous samurai, the ones who are remembered in the history of succeeding generations as a symbol of honour and loyalty, respecting a concept which, nowadays, is quite obsolete: giri*

*Although, throughout the centuries they were guided by an unwritten code, the legendary bushi developped - among other things, a remarcable art - Ju-jitsu, which throughout the centuries proved to be the source for many sports and modern fight disciplines. It is already notorious the beneficial influence of the martial arts on the pshycho-physical system on the individual who tackles them.*

**Keywords:** *Ju-jitsu; martial arts; fight sports; pshycho-physical training*

### **Historical preamble**

“The fight” as a social phenomenon has entered in the existential sphere once the existence of the first life forms. Whether it was about the fight as a means of survival in the nature or as a confrontation with its own fellows, one can speak about “fight” as a way of going through this dimension.

Naturally, the fight as a martial phenomenon, brought the apparition of strategies concerned about its efficiency, whether it was about the fight between two or more people or about a fight between two or more armies. This way, worldwide, there have appeared a lot of systems of fight, differentiated on the temperament and the level of culture, as well as the level of civilization of the people on a certain geographic area.

This phenomenon received the name of *Martial Arts*. *What are they, the martial arts? Why „martial arts” and not systems of fight, battle techniques, etc?*

*Martial arts are complex driving systems of manifesting the psycho-physical-technical abilities, approached in order to improve the quality of the psycho-physical system or to acquire the martial abilities.*

We say „martial arts” and not in some other way, as the way of execution of the drive acts and/or the specific techniques of some styles, it is manifested according the some well-defined patterns, having as main resultant, most of the times, the making of some drive actions, harmonious and effective both in the context of the the fight itself as well as from the viewpoint of the beneficial action on the psycho-physical health state.

It can be stated that, at the origin of the martial arts there is an archetype: the one of fight and creation. In the way of thinking of the archaic human being, the fight of the contrary principles is perceived first of all in the natural environment, especially in the alternance of the seasons, the one of abundance and drought and of course, the one of life and death.

The subsequent evolution of humanity discovers at the social level the same confrontation of principles which brought

inevitably the progress and ascendent movement.

The continuous migration of humanity with a view to conquer, seize and own new territories or impose some ideas / principles, lead to the spread of different fight forms, depending on lots of parametres, which, in time, managed to get crystalized in STYLES of fight. Therefore, fight existed from old times, starting from the need to survive and afterwards, the one of supremacy over the fellows, turning out to be known during the modern age as SPORTS.

The sportive phenomenon has generated methods and movement exercises done with craft and suppleness, which is able to cross the brutal force, highlighting the sportive movement and creating at the same time a new trend of practicing it — including the one of the martial arts, from the perspective of the modern life.

### **Japanese ju-jitsu: original and borrowed features**

The great majority of the budhist sources recorded the fact that in the mythical Japan it was practiced a form of fight 1000 years B.C. as a ritual, named *Sumo*. In those times, Sumo was held, apart from the cases when it was not about a religious ceremony, in a primitive and barbaric form of fight, and it was not rarely when the winner of the fight was also the single survivor.

The specialists in the field authorize this discipline as being the ancestor of Ju-Jitsu.

Nevertheless, starting even with Sumo, the Japanese ingenuity became obvious, setting as a form of art an entire series of fight disciplines such as: *Ba-Jutsu* (the art of horseriding), *Ken-Jutsu* (the art of the sword), *Kyu-Jutsu* (the art of drawing a bow), *Naginata-Jutsu* (the fight with Naginata — the spear made out of a stick which had at one of its ends an attached sword), *Bo-jutsu* (the fight with the stick), *Zori* (the fight with the pike), *Ka-jutsu* (the art of using the fight), *JU-JITSU*, *antiquated JU-JUTSU* (the art of suppleness), *Karate* (the art of bare hands) etc.

These arts became visible out of a style which at the beginning covered them all: Ju-Jitsu (or TAI-JUTSU — „the art of handling the body). Nevertheless, altogether with the evolution of the bushi

(fighters) class on the history ladder, a significant part of these disciplines have divided, thus appearing new and modern disciplines, such as: Judo (the way of suppleness), Aikido (the way of harmony), Karate (the art of bare hands) — with the multitude of styles: *Shotokan*, *Kyokushinkai*, *Goju-ryu*, *Wado - ryu*, *Shorin - ryu*, *Kendo* (the way of the sword, the fight/fencing with bamboo swords), *Iaido* (the art of taking the sword out of the scabbard), *Kyudo* (the way of the bow) etc.

The paternity of Japan over JU-JITSU is undisputed, considering only the arguments presented above.

The concept of „JU-JITSU”-„*art of suppleness*”, comes from „*JU-supple*” and „*JUTSU-art*”.

Ever since the Kamakura (1185-1333) time period there were (according to some authors they were created during those times) a series of fight techniques elaborated by bushi (warriors) which were used in the case of the bare hands light against the armed opponent.

Nevertheless, Ju-Jitsu had been used before that period (end of the time period Heian: 794-1185) by the legendary warriors NINJA, which, due to their pragmatism, they became aware of the its extraordinary effectiveness, using it, most of the times, in not exactly noble purposes.

These techniques have been considered the beginning of Ju-Jitsu art, being created out of the old Kumi-uchi techniques (or Yawara), especially described in „*Konjaku Monogatari*” ( a budhist work which dates back in the 13th century). They represented the base of Ju-Jitsu ramnification in numerous Ryu (schools) such as: *Wa Jutsu*, *Yuiga*, *Teiho-son*, *Miso-Ehokusin*, *Isei-Jitoku* etc.

During Ashikaga or Muromachi (1338-1573) time period there have been developped two trends: one by the non-martial Sumo and another one by the martial arts such as: fencing, pike fight, drawing a bow, etc.

The first man to systematize a form of hand to hand fighting based on Ju-Jitsu principles was *Hisamori Takeuchi*, who created a technique named *Torite* and *Kashimawari* (the art of grabbing the opponent). Later, *Eishin Inugani* developped a new technique



by combining the hand to hand fighting using the sword. This technique has been named *Kenden-Kumichi*, being then changed into *Kumiichi* and later into *Yoroi-Kumiichi* (hand to hand armed fight).

At the beginning of the time period Tokugawa (1600-1867), *Hichiromen Fukuno* created a new technique named *Yawara-Ryoshinto* which comprised what nowadays could be regarded as the *principles of Ju* (the principle of climbing down or non-resistance).

Around the same time period, *Jushin Seiguchi* founded a school which insisted a lot on *Ukemi* art (specific falling). These two schools systematised the content of their techniques, creating the adequate frame for Ju-Jitsu as an independent unarmed fight form.

Also, at the same time (around 1600) it is supposed to have arrived in Japan the *Chin-Gen-Pin* or *Chen-Yuan-Bin* priest, who would have brought and taught a series of procedures based on roll-outs and volts, drifts and crafty movements of throwing down on the ground, articulated techniques as well as hit techniques.

Regarding the *Chen-Yuan-Bin* or *Chen-Yoan-Pin* „phenomenon”, he was one of the numerous warrior Shaolin monks came from Japan, initially as master in ceramics for *Daimyo-ul* (the great noble) feud Owari. As he trained *ronini* (samurai without master) in the fight without weapons, residing in blows in the vital points and articular techniques, he was noticed by the instructor of the clan of samurai from Owari and taught them what later would be known as *JU-JITSU*.

Master Jigoro Kano (the father of JUDO) has accredited him with it.

In the modern age, the old Ju-Jitsu keeps on surviving both through the disciplines adapted by the modern masters to the requirements of the modern life, Judo respectively — created by professor Jigoro Kano and Aikido, created O Sensei Morihei Ueshiba, but also through a series of schools in the field which managed to resist despite the time. In this way we can mention: *Takeda-Ryu*, *Wa-Jutsu*, *Ju-Tai-Jutsu* (within Ninjutsu Bujinkan), *Goshinjutsu* (Ju-jitsu for defence), *Kendo* („the way of the sword“) etc.

### **The structure of Ju-Jitsu and its implications**

It has appeared with a view to approaching the „total fight”, in which no element of a possible confrontation has been omitted: the stand or ground fight, the fight with or without weapons, the fight at a short distance, on a bumpy ground or in the water or limited area etc, Ju-Jitsu was always filled up with new and diverse techniques, as fruit of the generations of trainees and/or masters preoccupied by this phenomenon.

This way, even in the contemporary times, Ju-Jitsu has a complex structure, even a complicated one for the outsiders.

In reality, the structure of Ju-Jitsu illustrated below, respects both the practical side but also the methodical-pedagogical one, it provides a complete image over the possible positive transformations of the trainee, both through the martial perspective but also ethical and pshycho-physical one.

In a brief approach, Ju-Jitsu has the following groups and sub-groups:

- *REGISHANO/REI-SHIKI* (Etiquette, ceremonial);
- *SHINTAI/TAI-SABAKI* – movements and swivelling, turn-overs, roll-outs;
- *UKEMI-WAZA* — techniques of falling;
- *ATEMI-WAZA* — hitting techniques;
- *Atemi-WAN-waza* — hitting techniques with the arms;
- *Atemi-GERI-waza* — hitting techniques with the feet;
- *Atemi-TAI-waza* — hitting techniques with the body;
- *NAGE-WAZA* — techniques of protrusion;
- *KATA-TE-waza* — techniques of protrusion with the help of the shoulder and /or the arms;
- *ASHI-waza* — techniques of protrusion with the help of the shoulder;
- *GOSHI-waza* — techniques of protrusion with the help of the hip;
- *SUTEMI-waza* — techniques of protrusion through sacrifice;
- *MA-sutemi-waza* — with front sacrifice;
- *YOKO-sutemi-waza* — with lateral sacrifice;

- *KATAME-WAZA* — techniques of immobilization/fixing;
- *NE-WAZA* – the art of the fight on the ground;
- *DOROBO-KANSETSU-WAZA* — techniques of forced transportation or *RENKO HO* – techniques of arrest;
  - *HOJO JUTSU (Torinawa)* – techniques of folding;
  - *KUMI-WAZA* – techniques of transportation;
- *SHIME-WAZA* — techniques of strangling;
- *KANSETSU-WAZA* — techniques of articulation;
  - *Ude-Kansetsu-Waza* – articular techniques over the arms;
  - *Ashi-Kansetsu-Waza* – articular techniques over the legs;
  - *Sebone-Kansetsu-Waza/Sekitsui Hishigi* — articular techniques over the spine.
- *KIAI-JUTSU* — the art of fight shouting;
- *KOBUDO* — techniques with the weapons;
- *KYUSHO* — the study of the vital points;
- *KUATSU* — methods of reanimation;

### **The influence of the technical groups of Ju-Jitsu over the psycho-physical system**

As it has been already highlighted above, Ju-Jitsu appeared as a necessity in assuring the survival in an era when the martial spirit was omnipresent. Even in those troubled times, the perseverent practice endowed the individual with skills, psycho-physical force and moral-volitive qualities beyond the common limit.

Although practicing out art is done in a hollistic way, meaning that the technical groups are harmoniously blended during the specific trainings, due to the didactic principles, we shall emphasize the main positive influences over *ju-jitsu-ka* which do on a regular basis at least three constant trainings a week.

*Regishano/Rei-shiki* – the ceremony; *Shintai* – the movements and *Tai-sabaki* – swivelling

*One cannot shake hands with somebody as long as one keeps their fist tight*”, used to say it Mother Teresa in the last century, one of the personalities of the Christian modern world, who preached the virtues of Christianity.

Japan, isolated and challenged by the hardships of nature, which formed a tough but gentle character of its inhabitants, always valued the worship towards the spirits of the nature, any existing being and even the respect for the opponent from the martial arts world. This way, the idea of *respect*, acquires special valences in the world of martial arts. From worshipping *the dojo* to worshipping *the Sensei*, the weapons for fighting or the opponent, everything has to comply with certain canons rigorously respected.

Nobody can do martial arts / Ju-jitsu, unless they respect the etiquette rules which impose courtesy, decency, behaviour, mutual support, etc.

All these lead to modesty, compassion, altruistic spirit, generosity. If one can accept these requirements, they can do martial arts, otherwise, it is certainly impossible. One may do whatever other sports but not martial arts for sure!

*The movements and swivellings* in martial arts are in a significantly other way than in the ordinary life. The constant control over the body, adopting a firm position, but supple / flexible adapted by the psychology of fight — or a particular daily situation etc, shall render in time emotional stability, confidence, dignity.

Keeping the backbone in an upright position — the central axis of the human body, confers health, flexibility, lust for life, desire for recognition and/or going beyond their own limits.

#### **Ukemi-waza — technique of falling**

„It is not shameful to fall, as it is important **how** one falls and stand up”, we often tell our disciples. *Life is full of ups and downs, it is not a straight route!* The psychology of the fight also implies techniques of self-imposed falling or triggered off by the opponent, which is therefore the reason why we recommend any likely practitant to understand the importance of the falling techniques, aspect which we approach in one of our works ever since 2005. Skipping any other unnecessary comments, we shall quote from the above mentioned work regarding the importance of this group in the evolutionary-educational process of *ju-jitsu-ka*:

- ☑ develops unconditional reflexes necessary to any trainee;
- ☑ there are the best self-protection methods in case of any situation of falling
- ☑ assures the natural passing from the standing fight to the ground fight or coming back within a short time after falling, in a situation of counter attack which is effective in the standing fight;
- ☑ they belong (it is a must) to an authentic budoka (trainee in the martial arts);
- ☑ contributes to educating the spatial-temporal equilibrium;
- ☑ have direct influence on the psychic (considering “*the school of courage*”);
- ☑ they can be or they are used in the case of executing some projection techniques through sacrifice, in order to avoid some situations and dangerous attacks as a ‘launching platform’ in executing some techniques;
- ☑ have beneficial influence on the back (as methods for massage and heating), when they are done with slow speed on a surface which is relatively soft;
- ☑ are simple and effective methods of checking the skills specific to *budoka*;
- ☑ have influence and can be applied in many life situations etc.

#### **Atemi-waza — hitting techniques**

Since the intrauterine phase, the foetus announces their presence through random hittings, letting know about the wish to evade to a world which will challenge them from all viewpoints. The hitting techniques in the martial arts, whether simple or complex, demands the muscular system and the psychic, thus contributing to their grinding.

A good hitting technique is not the one which destroys the opponent but the one contributing to the diminishing and/or eliminating the ancestral drives of an individual.

Considering all mentioned above, we shall focus on:

- the hitting technique consolidates the muscular system, with all which it covers: muscles, ligaments, bone levers;

- contributes to the consolidation of the equilibrium;
- strengthen the psychi system and the moral-volitive qualities;
- constitutes likely launching platforms for suppressing the negative energies through the training using a bag or other accessories of hitting;
- constitutes effective ways of educating the posture etc.

### **Abandonment techniques**

We shall refer in this chapter, out of space reasons, to the main groups which lead — most of the times , to the end of a fight: whether through providing the maximum score — in the sport competition, whether through getting the opponent in a non-reacting situation or a situation of unlikeliness of combat/giving up due to the effects of these techniques. We refer to the techniques of projecting, articular techniques or strangling techniques. Any of these, beyond the sportive or self-defence characteristic and possibly less destructive than a hitting technique, can represent as many ways as possible for educating / training a psycho-physical and moral system of superior quality over the casual days.

Our highlights consider the the following:

- executing a projection technique implies: a certain level of the driving qualities (speed under different forms: execution, reaction, movement, force, skill, etc.), coordinative qualities (segmentary coordination, spatial-temporal orientation, the sense of rhythm /opportunity, etc.); moral-volitive qualities;
- executing a certain articular and/or strangling technique, beside the elements highlighted above, also implies being aware at a satisfactory level, of the anatomy of the human body, minimal notions of physiology, a special moral condition — in order to limit the destructive aspects which can be very serious, control in limiting the effects of the technics, etc.

Concerning the other technical groups which I mentioned in the subchapter „the structure of ju-jitsu”, we shall keep in mind that each of them represent as many modalities through which one can contribute to the progress of the individual on the human society ladder/

From approaching the breathing exercises to being familiar with the first help notions (*Kuatsu*) or working with the weapons (Kobudo), everything can be used as a method for *psycho-physical training in the contemporary era*, an era which we have at hand so much information which, quite often, confuses us, this way hiding from us the way which fits us best on the evolution scale.

### **Some conclusions**

We are living in a world which is assaulted by the IT era. We want lots of things and we are in a hurry.

We want to get better in various domains, but quite often we end exhausted by the variety of the obligations which we have to fulfil or of the activities which we tackle.

By its complexity and variety, *JU-JITSU* can be a ‚breather‘ for discharging worries, a method of calming, calming and reorientation of the energies which assault our being.

The complexity and variety of style gives one the possibility — if you approach it sincerely and correctly, with a view to re-assess the valences of the life in this dimension.

When we say ‚sincerely and correctly‘, we refer to the feeling in one’s depth of their being the effect of the specific techniques, not only to execute them on the partners of study.

This way, one can have the possibility to feel the virtues of the troubles of the life: whether they are triggered off physically — by certain trials, whether they are challenged at a subtle level by the negative energies we could not make progresses without.

Practicing Ju-jitsu sincerely and altruistically, one can have the possibility to reconfirm what the Japanese people have stated for centuries: „*Ju-jitsu is a long way – michi, which we one have to follow here, on Earth, in order to reach the ENLIGHTMENT!*”

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## THE INFLUENCE OF TECHNIQUE ON THE PERFORMANCE IN THE SWIMMING EVENTS

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### **Abstract**

*The present study aims the theoretical and experimental research regarding the major part of the technical component among junior swimmers. Increasing the efficiency of the educational process requires the establishment of specific aims, of a well objectified and optimized operating plan as well as the selection of the most effective methods and means of operation.*

*The establishment of some training norms as well as the judicious use of the most effective ways and means particular or not for swimming should lead to:*

- The appropriate acquiring from the point of view of the technique of the four swimming procedures*
- The development of driving skills*
- The demonstration of the validity of the methods used and the applicability of some tests in order to follow the qualitative development of driving skills.*

*Implementing systematically a model of professional algorithms for learning, consolidation and improvement from a technical point of view, during an educational year, the sportsmen will obtain superior results.*

**Keywords:** *Model, algorithms, driving skills, methods, means, efficiency*

### **The organization of the research**

The experiment regarding the certification of the efficiency of the means used in the swimmers training process was developed during a period of six months, considering this way that the gathered results can lead to decisive conclusions.

The experiment consists in implementing a system of means, in order to learn, correct, consolidate and improve the crawl swimming technique, leading to the improvement of the swimming performance in the speed test among juniors. For the efficiency of the experiment we implemented three types of testing: initial, intermediate and final.

Between June — November the technique exercises were allocated in the following way: on Monday (crawl and breaststroke), on Tuesday (butterfly and backstroke), on Wednesday (crawl and breaststroke), on Thursday (butterfly and backstroke) and on Friday crawl and breaststroke.

### **The development of the experiment**

During the period between the 1<sup>st</sup> of November and the 28<sup>th</sup> of November 2013 suitable for the uploading period, according to the technical training plan, 3 times a week, emphasizing on the training volume which was of 3600 — 3800 m/ training.

During the period between the 29<sup>th</sup> of November and the 4<sup>th</sup> of December 2013, suitable for the straitened period, according to the training plan, the technical training was pursued. These exercises were performed intensely on the grounds of diminishing workload. There were effected starts, back tracks and arrivals.

*The reiterations were performed on distances of 12,5 m, 25m, in numbers of max. 8 recurrences.*

During the period between the 1<sup>st</sup> of March and the 15<sup>th</sup> of March 2014 followed the activating period of the workload, diminishing the effort and the numbers of training emphasizing on the technique.

During the period between the 11<sup>th</sup> of March and the 22<sup>nd</sup> of March, suitable for the straitened period, the workload diminished

and the intensity increased, there were performed recurrences of 12,5m and 25m. The measurements effected on the occasion of the initial and final tests at technical and performance challenges using the following current statistic indicators: arithmetic mean, amplitude, standard deviation, the irregularity factor.

**Interpretation of results**

The experimental results were systematized in tables, statistically elaborated and interpreted according to the methodology of the research of physical activity science. In view of validating the research supposition, the data are analyzed from a statistic point of view and from the point of view of the domains’ professional literature.

**Tabel.1.** Diferences between statistical parameters calculated.

Statistical parameters	Initial test	Intermediate test	Final test	The difference Initial test- Final test
X	40,47	39,96	37,82	2,65
W	18,90	13,27	8,18	10,27
Am	3,54	2,93	2,00	1,54
S	4,38	3,48	2,38	2,00
Cv	10,82	8,70	6,29	4,53

**Conclusions**

According to the statistically elaborated and registered data we can synthesize the following:

- The results obtained at the performed tests improved continuously, finally the progress being obvious. The other statistic indicators taken into account had values characteristic for well established and trained communities.
- The appraisal of the technique, although more difficult to realize but in this case based on a strict algorithm, proved an improvement of the technical skills, due to the judicious election of the independent variables.

We esteem that focusing on the technical component of the sport training, especially at this age, when the psycho- physiolog-

ical characteristics of the subjects allow great driving acquisitions: large receptivity, plasticity of the nervous system, a wish for emulation etc. is very important and this thing is obvious in the progress registered in the challenge taken into consideration.

It is certain that the strict quantification of the technical influence and the procurement of the sport performances are difficult to realize but referring to the specialty literature we consider that at this age the technical component must come before the physical, tactical and psychological ones.

The obtained results, both on the driving plan and on the one of the technical accuracy, confirm the experimental conjecture statistically.

Finally, I consider that the selected means regarding the technical preparation reached their aim and I recommend to other field experts and use them and adjust them to the subjects' particularities they develop their activity with.

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## STUDY ON THE POSSIBILITY OF HIGHLIGHTING INVARIANTS OF MOTION IN MARTIAL ARTS KATA EXERCISES

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### Abstract

**Introduction:** Martial arts are practiced both as a hobby, for physical and psychological training, as well as professional sport with its own rules and competitions. How is performed every move in karate is highly important. In this article we analyze some movement in kata exercises. **The purpose** of this paper is to demonstrate the existence of stable aspects of movement - motion invariant during the execution of technical elements of kata. Our application was made on the kata Heian Nidan. **Working methodology** consisted in achieving some tests relating to kinematic characteristic of motion, in the kata mentioned before. We use an inertial navigation system that contains 17 sensors - MVNBiomech, produced by Dutch company XSENS Technologies BV. Female athlete tested holds a black belt, she practice karate for 8 years and have 22 years old. **The results** obtained refers to the oscillation of CGM height, on a total of 12 repetitions from kata sequence selected. The average values of height oscillation to CGM = max. 92 cm and min. 72 cm., St. dev. is Min. = 0.002 and Max.= 0,013 while C.V. = max. 1.7%. **Conclusions** drawn from the above results indicate that the average values are representative and homogeneity is high. Thus we can say that the invariants (general form of repetitive motion), can be recognized in the development of technical elements of martial arts kata exercises (and we can say in other sports). This emphasis of movement patterns can be useful both referees and coaches involved in the educational process.

**Keywords:** movement, analysis, karate, kata Heian-Nidan

### Introduction

Karate as a sport, permanently enjoyed by a strong sympathy from several categories of people, from children to older persons, mens and womens for pleasure or for competition. It is well known that this sport is divided in three main categories: - kihon (where students learn simple technical elements), - kata (where karateka learn how they can put together successive technical elements, symbolizing a fight with an imaginary opponent), - kumite (is the effective fight on the mat, with a direct opponent).

Invariants or invariable phenomena are opposite the variability and can be defined as: “*Invariant* (sf) maintaining unchanged of a sizes, a system of numbers in a certain transformation; stability and fixity. (<fr.invariance) “(<http://dexonline.ro/definitie/invariance>).

Regarding the kata chosen to be executed during testing, Amalinei 2010 says: “In the kata Heian Nidan is studied kokutsu dachi position and the corresponding displacement”. In this position, as indeed in most of the techniques of martial arts (not only the position or displacement) is of crucial importance position and control the center of mass of the athlete.

Other authors claim that a kata, Heian Nidan as is, “teaches practitioners how to execute various techniques while moving forward, backward or sideways, with different speeds, without losing balance, coordination, muscle control and concentration” (Chandler. RC, 1998, wp).

Bruce Lee brings into discussion the concept of kinesthetic perception and say on this, that is the ability to feel the contraction and relaxation of muscles (ie athlete to be able to know at any time how operate a muscle) (Lee B., 1992, p. 45 ).

What is to remember here, is that balance means a permanent self control of the center of mass (weight). This is strengthened by some experts: „Difficulties in maintaining the balance are determined by the size of the base of support and the ability to produce muscle momentum“ (Chapman, 2008, p. 60).

It is also very important to take into account the regulations

provisions, which require four main criteria of equal importance, when considering an athlete performing a kata. The main criteria are: “(1) compliance (with form and standards of each school); (2) the correct technique (by: positions, technical elements, transitional movements, timing, synchronization, proper breathing, concentration - kime); (3) athletic performance (proving: strength, speed, balance, rhythm); (4) technical difficulty of the executed kata “. (W.K.F., 2013, pp. 24-25).

When athlete learn an element or a movement, experts say that in the cerebral cortex is formed so-called motor engrams, about the element to be learned. “When motor engrams are better fixed, muscle activities takes execution speed, intensity and complexity. In fact, engrams will not only achieve the desired movements but will inhibit synapses wich is not necessary to enter into scheme of movements. (Sbenghe, 2008, p. 350).

We believe that while learning the technical elements from martial arts (kihon) and logical sequence of learning kata exercises, the athlete catch some engrams, some split schemes to facilitate learning, following that the student, through repetition be able to master very well and achieve their binding, so as to result in final the kata exercise. In martial arts, uses the expression “the practitioner must become one with the technique” (Tokitsu, 2010, p. 25).

The invariant trajectories, confirms that the technique of exercise is properly acquired and may lead to better stability, balance and coordination of movements, wich can influence positively the final grading in kata’s executions.

**The purpose** of this paper is to demonstrate the existence of stable aspects of movements (invariants of motion) that would later constitute the reference for those involved in the body of competitions judges, referees, and a tool for providing real-time feedback to coaches and specialists, dealing with preparing karateka athletes.

**Hypothesis:** In this paper we want to check if, through MVNBiomech - Xsens equipment, can highlight the existence of invariants (general form, repeatable of the movement) in some complexes exercises of kata, from martial arts.

### Research Methodology

In this paper we performed an investigation (testing, data collection and processing), of kinematic characteristics, in movements from shotokan kata “Heian Nidan”, with MVN Biomech system, produced by Dutch company XSSENS Technologies BV, which uses inertial motion transducers, and an advanced mathematical apparatus for identifying movement for a total of 23 body segments, according to the segmentation model approved by the International Society of Biomechanics (Wu G. et al., Journal of Biomechanics, 38 (2005) 981- 992).

The experiment was conducted in august 2014, at National Institute for Sport Research Bucharest in biomotric laboratory. Our subject was a female athlete, shotokan karate practitioner, member of CS Aiko Bucharest. The effective testing consisted in performing a sequences from Heian Nidan kata, specific in shotokan karate. This sequence took about 3.5 seconds and comprised six technical elements (conf. Fig. 1). To see any similarities between the patterns of movement on this section of exercise, athlete has made a total of 12 repetitions of this portion of the kata.

Must mention that we calculate, for center of mass height oscillation, indicators wich can determine the central tendency, trace of the movement (average), or indicators of variation such as: - standard deviation (St.dev.) and coefficient of variance (C.V.), for all synchronized data group, of registered athlete.



**Fig. 1 . Comparative presentation of two technical elements performed by the sportswoman, taken with a foto camera and a capture from MVN Biomech program (capture and fotography are made at different repetitions).**

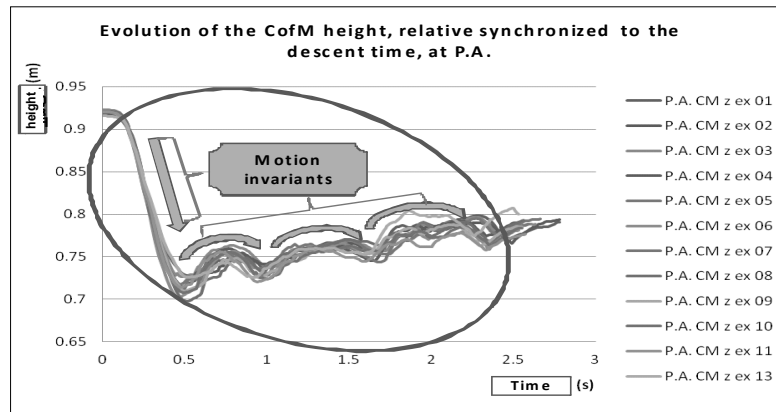


Recorded images with MVN Biomech technology were checked and adjusted by MVN Studio software, in the limits permitted by this and to comply anatomical model. After, all data was exported into Excel document in which we could analyzed, process data, and were calculated statistic indicators, that interested us (average, Std. dev. and C.V.), and after were generated all graphs.

### Results

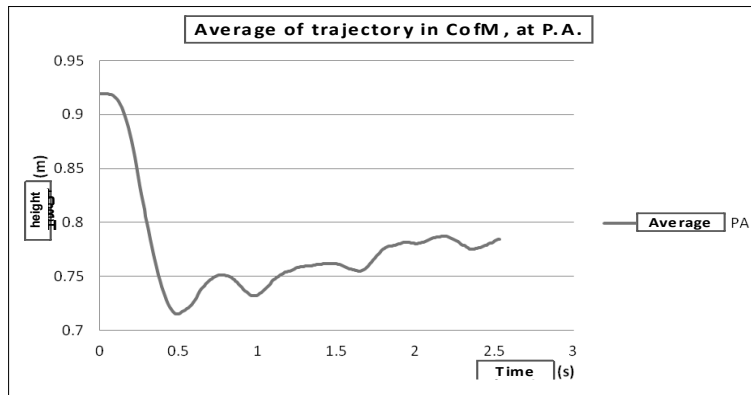
In Fig. 2 are presented height oscillation on CofM for all 12 repetitions of kata recorded. It is clearly to observe that the first part of movement is almost perfect, indicating a note of invariance. After lowering moment, CoM trajectories split in each repetition very little, but the general form of motion is almost identical, indicating a good invariance of the movement throughout the execution. I highlighted it with green arrows marked on the chart.

The athlete starts at a height of about 92 cm, descends to about 70 cm and the movement ends around 78 cm height. After completing the descent phase, we observe also bottom three curves that are generated by that karateka working with upper limbs, which produces a slight oscillation of CofM. However this oscillation is common to all 12 repetitions which highlights the invariance of movements.



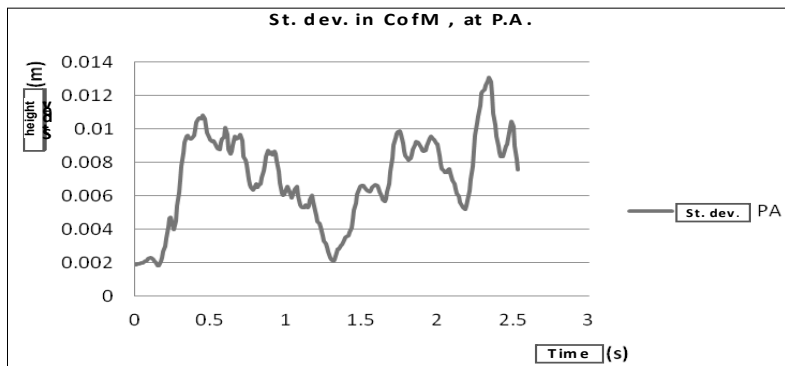
**Fig. 2.** The synchronized CofM height oscillation and the indication of invariants present on the movements trajectory of all repetitions, at P.A.

In figure 3 we present the mean trajectory of 12 repetitions performed by athlete. There is a slight ascent of the CofM, a possible cause is the movement of arms, wich initially running to the left and then to the right. Viewed from the kata correctness standpoint, this ascent of CofM is not indicated, because it may negatively affect other movements or technical elements which are made by the karateka.



**Fig. 3.** The CofM evolution average of the 12 exercises analyzed at P.A.

In what concerns the standard deviation presented in fig. 4, we can notice low values ranging from 0,002 to 0,013. Specialized literature tells us that standard deviation is an indicator of the representativeness of the average, “the bigger standard deviation, generate the greater unrepresentative means for the row of data” (Galea, 2010, p. 43). When looking at the St. dev. one can say that, in our case the average is highly representative.



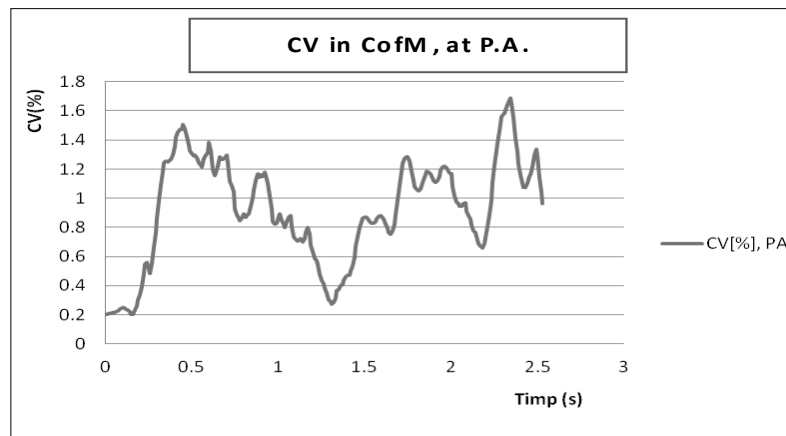
**Fig. 4.** Representation St. dev. on CofM evolution for all 12 P.A. in analyzed kata.

Figure 5 illustrates the CV(%) of the CofM oscillation, at the 12 repetitions of the chosen and recorded kata exercise performed by the sportswoman. It is noticeable that this ranges from 0,2 to 1,7 % are very good, values that represent a very high homogeneity.

Some authors consider that a group is homogeneous at values that do not exceed 30 % (Murări?a, 2009). Other authors make a much tighter classification of the CV and claim that: “a group is homogeneous if the CV values reach a maximum of 10%; 10% to 20% can signify a population relatively homogeneous; 20% to 30%, a population relatively heterogeneous, and over 30% indicates a population heterogeneous” (Dragomirescu, 2009, p. 76). Even with this classification, in the present case we are dealing with a high homogeneity.

Legend:

- CofM = (general) center of mass; - St. Dev. = standard deviation;
- CV = coefficient of variability; - Average = mean.



**Fig. 5.** Representation of CV at the CofM parameter for the 12 exercises analyzed at the P.A.

### Conclusions and discussions

We note that the hypothesis is confirmed in the sense that: - we found after tests conducted and after data processing, using a modern equipment for measuring kinematic movements, that

invariants (general form of repetitive movements), can be found in the deployment of some technical elements from kata exercises, and that these invariants are recognizable, can be repeated by athlete, from a movement to another (by the same person).

Taking into consideration all of the statements presented above, we believe that such a method of movement invariants determination can represent an important tool for coaches involved in the sports training process, instrument that can provide precise feedback concerning the correctness of the technical execution, in real time.

We consider that this method can also represent a useful tool for the referees who evaluate the kata exercises, eliminating almost completely the presumption of subjectivism, due to the swiftness of the performance, the insufficient experience or shallowness of assessment.

We believe that the subject studied in this paper should be researched further, as this technology can be put to a wider use in other sports areas (especially individual sports) such as gymnastics, tennis, some sections from athletics, and so on.

### **Acknowledgments**

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## SITUATIONS OF STRESS PRE-COMPETITIVE OF YOUNG BRAZILIAN'S ATHLETES

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### Abstract

*This study **aims** to identify the level stress pre-competitive for young athletes who participate in school sports competitions. By a descriptive research, the sample established for convenience, with a total of 207 participants (n:207) of both genders, aged between 14-18 years (average of  $15.89 \pm 0.78$  years), 85 was boys (average of  $15.87 \pm 0.86$  years) and 122 was girls (average of  $15.90 \pm 0.72$  years) all from the City of Carapicuíba's – São Paulo, Brazil; the instrument used was the LSSCPI. The **results** shows no significant difference between genders, boys with  $2.65 \pm 1.21$  of stress average and girls with  $2.67 \pm 1.34$ . We **conclude** that the scale has shown good performance on its stability and reliability, and that the average stress is moderate in both genders.*

**Keywords:** *Stress pre-competitive; Young Athletes; Sport.*

### **Introduction**

The sport can lead decisive factors for the emergence of stress, since as a result to internal and external conditions that involve one person, several factors coming from the environment in which the individual belongs, may represent potential incentives that causes estresse<sup>1</sup>

De Rose Jr<sup>2</sup> says that the sport is a potential to cause stress if not appropriate and adapted to the needs and capabilities of practitioners. Santos et al.<sup>3</sup> argue that the most experienced athletes tend to demonstrate lower levels of stress pre-competitive, due to their greater experience in sports competitions.

The pre-competition stress on practicing school men's volleyball, aged between 15 and 17 appeared in the responses of athletes were the ones that provide high levels of anxiety, these symptoms are viewed as the factors that may interfere with the sporting performance of each young atletas<sup>4</sup>.

Regardless of the outcome of the competitions, the stress should be a point of concern as to how it affects each individual is personalized, in other words, some athletes may experience higher stress compared to the others<sup>5</sup>. Moreover, as Myers<sup>6</sup> explained the adaptive response of the body to stress has three stages: the first one experiences an alarm reaction by activating the sympathetic nervous system; in the second phase, the resistance of the body is ready to counter the challenge. Persisting stress the body's reserves become deplete and cause the third stage, exhaustion.

Weinberg and Gould<sup>7</sup> describe the stress as a process containing four stages. First, the individual and placed a demand that can be physical or psychological, after the second stage is the perception regarding to the demand, which is different for each individual. Third step response occurs as demand lodged, and the last stage and the behavior of individual the stress caused by this process, so a continuous cycle especially when the answer is negative.

In addition, worth noting that the pre-competitive stress can cause consistent changes in the behavior of an athlete before competition, disfiguring his hours of sleep, and during sports practice, harm your desempenho<sup>8</sup>.

Therefore, this study aims to identify the level pre-competitive stress for young athletes who participate in school sports competitions.

### **Materials and Methods**

#### *Sample and Place of Research*

This study reinforced a descriptive research<sup>9</sup>, and the sample established for convenience, with a total of 207 participants (n:207) of both genders, aged between 14-18 years (average of  $15.89 \pm 0.78$  years, variation coefficient 4.90%); 85 was boys (average of  $15.87 \pm 0.86$  years, variation coefficient 5.41%) and 122 was girls (average of  $15.90 \pm 0.72$  years, variation coefficient 4.52%); all the sample attend the first, second and third year of high school in a Public School at Carapicuíba's City - São Paulo, Capital - Brazil. The school sample was linked on the assumption established by Pasquali<sup>10</sup>, stating that "are needed for sample 10 subjects for each item of the instrument; thus an instrument with 100 items would require 1000 subjects". The data collection procedure followed keep contact with the Director of the pertaining to school unit and the same was authorized data collection signing the commitment of the institution; then we, with the signing of the Consent Facility and Term of Consent by parents or guardians, since the participants were adolescents, thereby following all care research ethics it collecting data only meant to answer two instruments. The procedures for data collection followed the Newsletter to Research Subjects and signature of the Terms of Consent, by paying attention to research ethics set by the Declaration of Helsinki, 19649, Resolution no. 466, 2012.



*Instrumentation and Statistical Treatment*

With the goal of achieving the aim proposed identify the level of pre-competitive stress of young athletes who join sports champion chips, we used the LSSCPI - LIST OF SYMPTOMS OF "STRESS" PRE-COMPETITIVE YOUTH CHILDREN - developed and validated by De Rose Jr<sup>11</sup>. This instrument also constitutes as a Likert scale of 5 points where the answers may vary: 1: Never/ 2: Rarely / 3: Sometimes / 4: Often and 5: Always. The applicability of the instrument provides that it be applied in the period from 24 hours before the sport competition, and can be administered to athletes aged 10-14 years, upper age range of athletes since the language is properly appropriate to them<sup>8</sup>.

As testing of the reliability and validity of the scale process used to calculate the Cronbach *Alpha's*. The application of this testing was bound to investigate the individual items of instruments, namely, the issues were seen separately if each item was deleted and hence possible correct answers in questions were conducted to raise scores of the constructs. This is a generalized coefficient of reliability that is more versatile than other methods and this coefficient is a feature that can be used with items that have multiple measures of values, such as writing test and the attitude scales to score as strongly agree, I agree, etc. In addition, the Alpha is probably the best coefficient to estimate the reliability in the most commonly used standardized test<sup>7</sup>.

Besides the reliability, we computing scores of the list pre-competitive stress, the mean, standard deviation, and the median of the students were determined using the following criteria: 1 Separated by age; 2 Separated by gender; we chose to apply for the Man Whitney test ( $p=0.05$ ) .

Data were organized and analyzed in the light of the SPSS software - DATA EDITOR, version 17.0 for Windows.

**Results and Discussion**

Testing the reliability of the instrument, the result of Alpha was 0.89, so the instrument still having a good performance, independent of the place or the social level.

The average stress of the group was 2.66 ( $\pm 1.34$ ), score total of 82.51; the boys average was 2.65 ( $\pm 1.21$ ) with a score of 82.36 while the girls have an average of 2.67 ( $\pm 1.34$ ) with a score of 82.83 (see Table 1).

**Table 1:** Number of subjects, Age, Average, median and Score of Stress pre-competitive

	N	Age	Average ( $\pm$ )	Mediam	Score
Boys	85	15.87 $\pm$ 0.86	2.65 ( $\pm 1.21$ )	2	82.36
Girls	122	15.90 $\pm$ 0.72	2.67 ( $\pm 1.34$ )	2	82.83
Total	207	15.89 $\pm$ 0.78	2.66 ( $\pm 1.34$ )	2	82.51

Looking for some differences between genders the results of median appoints that there is no difference between genders.

Comparing the results of the stress pre-competitive of boys and girls, we find no significant difference ( $p=0.642$ ), but, we must be attentive to the care in the work leading up to competition, not only with girls but also with the whole group. Therefore, in both genders the result of stress pre-competitive interspersed near the middle, that is, young athletes who participate in sports activities, have a reasonable emotional control.

The results of the scores become from the sum of all the results of the questions, thus the minimum value that can result is 31 and the maximum value could be 155 points of the total score. Observing the values of this study they are about very similar, as well as the total value of all young athletes

In this case, the boys participates constantly of sports competition, leading us to think that who have more experience in sports competition controlling theirs level of stress.

Researching with 216 athletes, of both sexes. The study showed that the attitudes of parents and coaches, and competitive

environment, were major generators of stress, interfering with the performance of the same<sup>12</sup>.

**Table 2:** Results separately by age-Average, median and Score of Stress pre-competitive

Age (years)	N	Average ( $\pm$ )	Median	Score
14-15	68	2.70 ( $\pm$ 1.34)	2	78.41
16	95	2.62 ( $\pm$ 1.35)	2	82.03
17-18	44	2.63 ( $\pm$ 1.29)	2	80.86

Observing the results of the Table 02 we can see that the highest average is from the subjects of 14 to 15 years old, so as in another research's the younger athletes has a higher level of stress pre competitive<sup>1,8,13, 14</sup>. In other study with girls who plays soccer a different result was found, proving that older players have a higher level of stress<sup>15</sup>.

And finally, to confirm if there is a difference between ages, we test the average difference between ages, considering a comparison between 14 and 15 years old with 16 years, the difference was significant ( $p=0.026$ ); comparing between the ages of 14 to 15 years and 17 to 18 the difference was not significant ( $p=0.122$ ), and finally comparing the subjects of 16 years with 17 to 18, the difference was not also significant ( $p = 0.705$ ).

Among the factors identified as most stressful are some that do not directly relate to the sport itself, but can be considered indirect sources of stress such as conflicts with teammates, coach and family, pressure from other people to win, sleeping badly at night previous game.<sup>16</sup>

### Conclusion

We conclude that the scale has shown good performance on its stability and reliability, and that the average stress is moderate in both genders, with no significant difference.

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**“AUREL VLAICU” UNIVERSITY OF ARAD  
FACULTY OF PHYSICAL EDUCATION AND SPORT  
PHYSICAL ACTIVITIES RESEARCH CENTER**

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Manuscripts submitted for publication should be clearly identified as **Original articles**: articles reporting the previously unpublished results of completed scientific experiments conducted by the authors, confirming or refuting a clearly defined research hypothesis.

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