



STUDIA UNIVERSITATIS
BABEŞ-BOLYAI



EDUCATIO ARTIS GYMNASTICAE

4/2011

YEAR
MONTH
ISSUE

Volume 56 (LVI) 2011
DECEMBER
4

S T U D I A
UNIVERSITATIS BABEȘ–BOLYAI
EDUCATIO ARTIS GYMNASTICAE

4

Desktop Editing Office: 51ST B.P. Hasdeu, Cluj-Napoca, Romania, Phone + 40 264-40.53.52

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RESEARCH INTO BONDING WITH PHYSICAL EDUCATION AT SCHOOL AMONG 11-18 YEAR-OLD TRANSYLVANIAN STUDENTS

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OLAJOS A. ANDREA⁴

ABSTRACT. By joining the European Union, Romania was given the opportunity to embark upon the “common European” thinking in the field of Physical Education. A research study (Gombocz 1999) conducted in Hungary at the end of the twentieth century points out that PE teachers think the popularity of physical education among students is on the decrease. This tendency holds true especially at secondary but also at primary schools. The aim of this research is to find out about the attitudes of 11-18 year-old Transylvanian boys and girls towards physical education and sports at school and whether the positive and negative attitudes towards physical education at school are manifest in the light of sex and age. The sample is made up of 1101 11-18 year-old students from Arad and Odorheiu Secuiesc. Distribution of the sexes: 411 boys and 690 girls. The method applied with the cross-section test was a questionnaire survey. Data collection and filling in the questionnaires took place in the academic year 2006/2007. Factors were created from the questions of the questionnaire. Nine questions belong to the factors relevant to our study. The 11-18 year-old Transylvanian boys and girls participating in the study had an overwhelmingly positive attitude towards physical education and sports at school. Our test results confirmed that boys, except for the age group of 11-12, showed a more favourable attitude to physical education at any age than girls. At the same time, positive emotional attitudes towards physical education decrease significantly from the age of 13-14 with boys and from the age of 11-12 with girls.

Keywords: *Transylvanian Students, Physical Education, attitudes*

Introduction

A great deal of research has been carried out among Transylvanian students in the field of their body culture. Soós and his colleagues are a good example, who conducted research into the physical activity as well as inactivity of Transylvanian students with the EMA (Ecological Momentary Assessment) method. Their research

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results show that 12-18 year-old Transylvanian youths spend most of their days sitting in one place. It has been found out that the “technology of modern times“ plays a significant role in keeping fit and in the shaping of the habits relating to it. This technology has resulted in the formation and firm establishment of new leisure activities and methods of change of place which do not require physical exercise (Soós and colleagues 2008). By joining the European Union, Romania was given the opportunity to embark upon the “common European” thinking in the field of Physical Education. In this respect Hungary is further ahead that is why it is important to summarize the endeavours of education policy and curriculum theory within the field of physical education at school both in Europe and in Hungary after the changeover to democracy, not forgetting of course the importance of practice and the sports profession (Hamar 2007).

Bonding with school subjects is an attribute of affectivity. Studying bondings throws light upon which subjects students prefer and to what extent in addition to showing which subjects they prefer more and which ones to a lesser degree. This allows us to draw conclusions as to the motivation basis of each subject. Bondings are basically attitudes which summarize more or less conscious but in any case emotionally defined and sophisticated recognitions and feelings. This means that bondings with school subjects are attitudes the shaping and development of which are influenced by the content of teaching in an extended sense as well as by the personality of the teacher and which might create interests or even aspirations shaping one’s future under favourable school and family influences (Báthory 1989).

As far as the degree of preference is concerned, physical education stands out compared with theoretical subjects among primary but even secondary school students. All this conveys the idea that physical education belongs to the subjects which are important motivation bases of school education and school learning. Positive bondings with this subject are related to the nature of the subject. However, such bondings show differences in distribution according to age and sex. First, this positive emotional attitude towards physical education slightly decreases with age. Secondly, physical education takes a more prominent position on the list of preference of boys than on that of girls (Báthory 2000).

Examination of the affective attributes, i.e. that of bonding with the subject is not a recent phenomenon. Biróné Nagy Edit (1994) reports in her ministerial-level research that physical education as one of students’ favourite subjects is a phenomenon supported by surveys – consequently, it is a fact. The emotions towards physical education, which feed attitudes, are basically positive with nearly half of the tested population. However, this is an average result; within this average there is a huge variation in the different age groups (Biróné 1994).

A survey conducted at the end of the twentieth century (Gombocz 1999) shows that physical education teachers think that the popularity of physical education is falling among students. This tendency is particularly true at secondary but also at primary schools. Physical education is still a favourite in a number of

schools just like its master, the PE teacher. However, the time of nearly unconditional preference is over. It is a shocking but statistically proven fact that a quarter of the 305 physical education teachers participating in the survey think that physical education and students' sports are indifferent, barely recognized areas without prestige among students at their schools.

Our study focuses on a subdivision of a comprehensive survey (Hamar and Karsai 2008, 2010; Hamar and colleagues 2010) targeted at the affective attributes of physical education conducted among 11-18 year-old Hungarian and Transylvanian students. The aim of the study is to find out about the attitude of 11-18 year-old Transylvanian boys and girls towards physical education and sports at school. Another question to be raised is whether positive or negative attitudes towards physical education at school are manifest in the light of sex and age.

Subjects and methods

Participants

The sample included 1101 students between 11 and 18 years of age. Distribution of the sexes: 411 boys and 690 girls. Distribution of students according to sex and age is shown in Table 1.

Table 1.

Distribution of subjects tested according to sex and age (capita)

Sex/Age	11-12 years	13-14 years	15-16 years	17-18 years	Total
Boys	88	130	89	104	411
Girls	102	156	190	242	690
Total	190	286	279	346	1101

Data collection took place in six schools in Arad and in Odorheiu Secuiesc. Educational institutions participating in the tests included Elena Ghiba Birta National College, Csiky Gergely School Group, Generalà No. 4 „Ioan Slavici”, Liceul de Artà „Sabin Dràgoi”, Liceul Pedagogic „Dimitrie Tichindeal” and Eötvös József Agricultural Secondary Technical School.

Instruments

The method used with the cross-section test was a questionnaire-based survey. The emotional reactions of students towards physical education and sports at school were surveyed with a list of questions compiled in advance, which enabled students to remain anonymous while responding. The questionnaire was intended to measure bonding with physical education classes, be it attraction or refusal. The positive or negative content of statements could be agreed (yes) or disagreed (no) with by students while responding. Data collection and filling in the questionnaires took place in the academic year 2006/2007. In every single case the assent of school directors as well as the cooperation of PE teachers was requested.

Data analysis

Out of the 48 questions of the questionnaire 10 factors (**F**) were formed. The number of questions as well as the numbers attached to each question varied with each factor. The factor relevant to our study and the questions belonging to it were as follows (see Appendix):

F5: positive attitude towards physical education and sports. Factor F5 included the following nine questions: No. 1, 5, 14, 18, 29, 31, 32, 37 and 38.

This factor measured the positive emotional attitude towards physical education at school. The numeric value of the factor is given with the proportion of positive responses expressed in percentage.

While processing the data, basic statistical calculations were carried out to examine the differences in sexes and age groups, followed by a multi-factor analysis of variance ($2 * 4$ ANOVA) as well as by the Bonferroni Post Hoc analysis.

Results

Among the respondents positive attitudes towards physical education and sports reach maximum values at the age of 13-14 with boys and 11-12 with girls (76.75% and 76.14% respectively). After that, a gradual decrease is seen with both sexes, and minimum values appear at the age of 17-18 (63.03% and 59.14% respectively). The difference between maximum and minimum values is 13.72% in the case of boys and 17% in the case of girls (See Table 2).

Table 2.

The average values of Factor “Positive attitude towards physical education and sports” according to sexes and age groups (%)

		Age Groups			
		11-12 years	13-14 years	15-16 years	17-18 years
Positive attitude towards physical education and sports	Boys	75.38%	76.75%	69.54%	63.03%
	Girls	76.14%	69.23%	64.56%	59.14%

Based on the multi-factor analysis of variance ($2 * 4$ ANOVA) a significant main effect ($F=18.980$; $p<0.001$) was found according to the variables of both sex ($F=6.60$; $p<0.05$), and age. No significant interaction was found in the relationship between the variables sex * age groups. Based on the results of the Bonferroni Post Hoc analysis, significant deviations ($p<0.05$) were found among the different age groups with regard to the tested parameter – with the exception of differences in the age groups of 11-12 and 13-14 years. (See Table 3)

Table 3.

Differences in the values of Factor “Positive attitude towards physical education and sports” according to age groups (p)

	13-14 years	15-16 years	17-18 years
11-12 years	0,951	0,001	0,001
13-14 years		0,007	0,001
15-16 years			0,014

Summary and conclusions

In response to the basic question of our study we can say that the 11-18 year-old Transylvanian boys and girls participating in the survey have an overwhelmingly positive attitude towards physical education and sports at school. This result is not surprising since physical education as a favourite subject is a nationwide phenomenon in Hungary justified by surveys – in other words, it is a fact of life (*Báthory, 2000*). However, the examination of the content of the subject does not exactly coincide with this because many students regard it as a so-called easy subject. Of course, the question is whether physical education is in fact an easy subject or whether it is felt easy due to the presence of other factors – such as perhaps the state of excitement which goes along with the efforts satisfying students’ interests.

The answer to our second question – whether positive or negative attitudes towards physical education at school are manifest in the light of sex and age – is a definite yes. Our test results confirm that boys, with the exception of the 11-12 year-old age group, display a more accepting attitude towards physical education at any age than girls. At the same time, the positive emotional attitudes towards physical education start to decrease significantly at the age of 13-14 with boys and as early as 11-12 years of age with girls. The decreasing average values of adolescents do not come as a surprise since this is considered to be evident in almost all segments of teaching. However, this hardly accounts for the fact that factor values are on the decrease among 17-18 year-old boys and girls. The degree of decrease also shows characteristics of sex and age since the difference between the boys’ maximum and minimum values is 13.72% whereas with girls the same value amounts to 17%. This is an unmistakable message for the PE profession.

This is a message because bonding with school subjects is influenced by two factors: the teachers’ individual characteristics and the nature of subjects. The first and presumably most important factor that influences bonding with subjects is the personality and the disposition of the teacher teaching his/her subject. There are stereotypes: the mathematics teacher is stern, the literature teacher is understanding, the art teacher has an artistic soul, the PE teacher is “cool”, etc. It is evident that PE teachers play a significant role in forming students’ attitudes at school and that the way physical education is taught together with the attitudes towards PE might increase

pedagogical effectiveness in the educational process as a whole. At the same time it cannot be denied that teachers' stereotypes as well as statements related to them contain a great deal of prejudice and a number of false elements in the mind.

The other factor, the nature of the subject might mean an interest in and a recognized importance of the subject as well as its significance for students' future plans. At the same time, it might involve an attitude towards frequently applied teaching methods in addition to characteristics relating to the studying of the given subject (whether it is easy or difficult, interesting or boring, etc.) Partly because of this, bonding with so-called "pleasure subjects" fundamentally differs from bonding with theoretical subjects (Báthory, 1989). This is true of physical education as well; a subject where students experience an emotionally colourful "world" by keeping fit. There are only few school activities like sports and training which abound in emotions.

These are important questions, all the more so because after long decades of fight in Hungary, it seems that the introduction of having a PE lesson every day in public education institutions might be decided on by the government, which will provide for five PE lessons a week by the curriculum. A bigger number of lessons, however, is not enough by itself in order to raise the status of physical education in Hungarian, or, for that matter in Romanian schools since lessons in a higher number per week have to be filled with real content and with added pedagogical value. This can only be guaranteed by the physical education teacher who is well-prepared both professionally and pedagogically, who likes their profession and their students and who can integrate the various factors of the educational process into their personality.

Acknowledgement

The authors wish to express their gratitude to the colleagues in Arad and Odorheiu Secuiesc participating in the test and data collection, namely to *Szomoru Elena, Erdei Emese and Hogyai Katalin*.

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APPENDIX

Emotional reactions inventory in Physical Education

Sex: male – female

Age:

School physical education (PE)

1. I have nothing against PE, I like movement activities.	Yes	No
5. PE should be more often in a week.	Yes	No
14. I feel better after PE.	Yes	No
18. I feel discontented if I can't exercise.	Yes	No
29. PE should be more frequently, even every day.	Yes	No
31. The time for exercising is too short in a PE class.	Yes	No
32. In my opinion, the school PE inspires one to take up sports outside school as well.	Yes	No
37. Sometimes exercises are strenuous in PE, but I like them.	Yes	No
38. I enjoy PE classes very much.	Yes	No

STRUCTURE OF COORDINATION CAPACITIES AND PREDICTION OF COORDINATION PERFORMANCE IN FEMALE HANDBALL

BROŽÁNI JAROSLAV, ŠIMONEK JAROMÍR¹

ABSTRACT. In the ontogenesis handball lays specific requirements on the level of coordination capacities. Coordination abilities develop differently from conditional ones and individual peculiarities of sportsmen should also have to be taken into account . The hierarchy of coordination prerequisites in the structure of game performance plays an important role. This is the reason why we present several important recommendations concerning the structure of coordination performance and the possible prediction of coordination performance in 11-15-year-old female handballers. The results should contribute to the facilitation of identification of sport talents, as well as to the reduction of coordination tests.

***Keywords:** handball, coordination capacities, sport performance, structure, prediction, girls.*

Introduction

Arrangement of requirements, which can be explained by the multifactorial theory. shows specific quantitative and qualitative signs in individual sport specializations. Knowing the taxonomy of individual factors (limiting and adequately determining sport performance), but also their certain simplicity (which is, however, limited to a certain degree, and decreases by the growth of performance) in the structure of sport performance points out to their importance upon their recognition. However, differentiation among factors, which are markedly genetically conditioned, and which can be more or less influenced by training. does not guarantee their utilization in the practice.

Revealing talents in sport is an issue of diagnostics of prerequisites for the given sport activity. Determination of procedures and criteria is inevitable for revealing inborn qualities and prerequisites of a potential sport talent. When searching for talents it is necessary to take into account data on health state, functional and motor

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prerequisites, psychic resistibility, personal characteristics and further factors. Selection of talents can be divided into two mutually influencing and referring phasis of revealing talent and prediction of sport performance (Hofmann – Schneider, 1985). For this purpose model load tests are frequently used and prerequisites are evaluated according to actual motor performance of individuals in tests (Blahuš, 2004). Speed and strength along with acceleration prerequisites are considered to be the decisive conditional factors. Technical prerequisites are assessed by experts. Tactical prerequisites are difficult to cover, but they are assessed using qualitative methods (e.g. assessment scales). Coordination abilities form an important part of sport performance but we still miss adequate tests for their assessment. Blocks of tests, which are used for talent selection at the age of 10-11 years, reveal the level of conditional factors, thus omitting the coordination ones in children, which are prevailing at the younger school age.

We recorded some attempts to determine hierarchies and changing share of individual abilities in various sports. In spite of the complexity of coordination abilities, they seem to be relatively independent prerequisites for motor control, while heredity plays here an important role (Bouchard et al., 1997). In children and youth relatively independent coordination factors were abstracted: reaction speed, balance, spatial orientation, kinesthetic-differentiation, rhythmic abilities, the ability to adjust and transfer motor activity, the ability to chain skills, etc.

Sport performance in handball and the share of individual coordination capacities on the overall performance were in the focus of several authors (Letzelter, 1978; Balandin et al., 1986; Zimmermann, 1983; Packa et al., 1998; Platonov, 1987; Mikuš et al., 2001, 2005; Jonath-Krempel, 1991; Šimonek, 1987, 1993; Zaf'ková, 1991, 1993, 1994; and others). The share of coordination capacities on the sport performance in handball represents approximately 15 %, while the strongest weight have strength abilities (30%) and speed abilities (25%). The same share as coordination capacities on the sport performance in handball show flexibility (15%) and endurance (15%).

Picture 1 Model of the structure of coordination capacities and their share on the sport performance in handball (Šimonek, 2002)

Explanations:

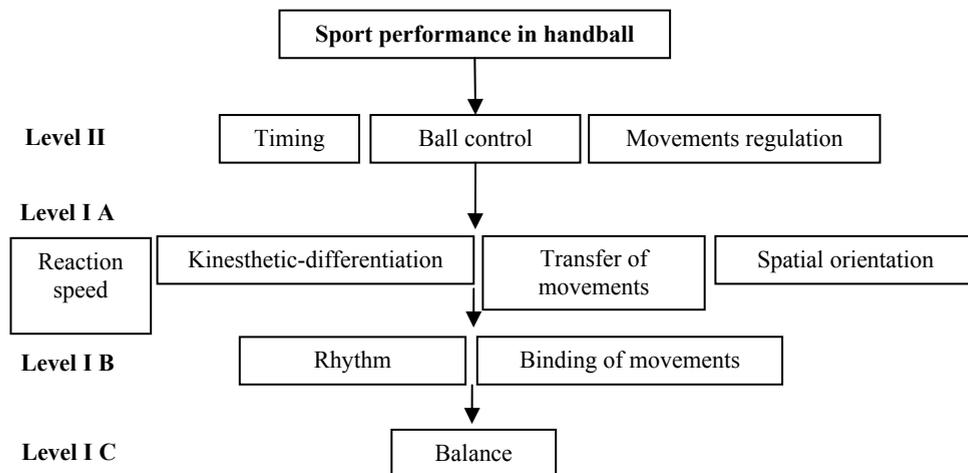
Level II - special coordination capacities. which directly limit performance

Level I - general coordination capacities:

Level I A – coordination capacities, which directly limit sport performance

Level I B – important coordination capacities (they can be compensated for from the point of view of sport performance)

Level I C – less important coordination capacities



Zimmerman (1983) presented the results of a survey of 43 experts on handball, which showed the ranking according to significance of individual coordination capacities as follows: 1. reaction speed and ability to rebuild movements; 2. spatial orientation and kinesthetic-differentiation capacities; 3. ability to bind movements in chains; 4. balance ability and 5. rhythmic ability.

Russian authors Balandin-Bludov-Plachtijenko (1986) based on factorial analysis made up the model of an elite handball player, which consisted of 10 mutually interconnected components: 1. special game endurance; 2. explosive power; 3. coordination capacities; 4. special speed; 5. general endurance; 6. special strength.

Using an analysis of game actions in handball as well as based on available literary sources Šimonek (2002) made up the model of the structure of coordination capacities participating in the sport performance in handball (figure 1).

The aim of the contribution is to present several notes concerning the issues the structure of coordination capacities and possibilities of prediction of overall coordination performance in handball in 11-15-year-old female handballers. The above mentioned areas should contribute to the solving of problems of identification of sport talents and complementing of the set of special tests.

Material and methods

The observed group represented 253 selected female handballers (aged 11 to 15) attending sport classes specializing in handball. (11-year-old - n=51, 12-year-old - n=51, 13-year-old - n=50, 14-year-old - n=50, 15-year-old - n=51).

Coordination performance has been observed using 7 motor criteria according to Hirtz (1985): T1 – Bench walking with 3 turns (dynamic balance), T2 – Stopping the rolling ball (complex motor reaction ability), T3 – Keeping the rhythm of movement

(rhythmic ability), T4 – Shuttle run (spatial orientation), T5 – Precision broad jump (kinesthetic-differentiation of legs), T6 – Precision throw (kinesthetic-differentiation of arms), T7 – Time estimation - 5 sec. (time parameters estimation).

Individual results in coordination tests were calculated to points based on a 5-grade coordination standard for handball according to Šimonek a kol. (2008), and added to one test value, which represents overall coordination performance level (predictant „Y“).

The dependence and share of individual coordination criteria towards overall coordination performance was estimated using the method of multiple correlation and regression analysis. Selection of three most valid coordination (predictors „ $X_{(T1-T7)}$ “) criteria into prediction equations of coordination performance was realized using forward stepwise regression.

Structure of coordination performance for individual age categories are presented by means of percentages in a pie chart. Prediction equations contain calculated coefficients of partial regression ($b_{0,3}$), standard error of regression (SEy) and the determinant of multiple correlation (R^2). For the interpretation of the results of measurements and formulating conclusions logical methods were used. Numeral processing of data was evaluated using statistic programmes Microsoft Excel and SPSS 13.0.

The research was solved within the grant project KEGA 3/3022/05: „Standards of coordination abilities for sport talented youth“, under the guidance of prof. Jaromír Šimonek.

Results and discussion

The level of coordination capacities in talented female handball players aged 11-15 years in the Slovak Republic are presented in tab. 1. Using multiple correlation and regression analysis the hierarchic structure of coordination capacities from the point of view of ontogenesis can be seen in tab. 2. By means of forward stepwise regression 3 coordination capacities were selected, by means of which it is possible to predict overall coordination performance with a satisfactory reliability. Regression equations for the prediction of overall coordination performance are presented in table 3.

Table 1.

The level of coordination performance in the observed coordination criteria in 11-15-year-old female handball players

Age	Indicators	T1 [s]	T2 [cm]	T3 [s]	T4 [s]	T5 [cm]	T6 [cm]	T7 [s]
11	Mean value	11.62	154.92	0.68	8.45	3.90	60.04	0.82
	Std. deviation	2.15	17.99	0.54	0.89	2.56	30.55	0.47
12	Mean value	11.71	150.75	0.55	8.29	3.62	69.36	0.95
	Std. deviation	1.97	18.52	0.44	0.93	2.97	31.55	0.65
13	Mean value	10.89	140.36	0.76	8.05	3.35	67.17	0.85
	Std. deviation	2.94	19.12	0.53	0.79	2.39	36.22	0.56

Age	Indicators	T1 [s]	T2 [cm]	T3 [s]	T4 [s]	T5 [cm]	T6 [cm]	T7 [s]
14	Mean value	11.21	136.40	0.78	7.78	3.09	56.30	0.79
	Std. deviation	2.33	13.15	0.61	0.66	1.97	39.15	0.63
15	Mean value	9.91	138.90	0.72	7.32	2.74	58.93	0.72
	Std. deviation	2.01	16.71	0.50	0.68	2.10	32.42	0.54

In handball players, the most important seem to be coordination capacities like rhythmic capacity and temporal parameters estimation (table 2). Among the three most valid variables in the structure of coordination capacities is complex motor reaction at the age of 12 and 13. Kinesthetic-differentiation of arms and legs along with rhythmic ability were dominant at the age of 11. Kinesthetic-differentiation of legs dominates also in the structure of the three most valid variables at the age of 14 and kinesthetic-differentiation capacity of arms at the age of 13. The least dominant among the three most valid criteria are dynamic balance at the age of 13 and spatial orientation at the age of 15.

Table 2.

The share of coordination abilities on the coordination performance in 11- 15-year-old female handball players

Test	Age				
	11	12	13	14	15
T1	7.58	4.52	15.40 ²	5.96	8.49
T2	14.76 ³	18.02	16.27 ¹	7.88 ²	8.87
T3	17.75 ²	18.49 ³	13.05 ³	20.16	17.44 ¹
T4	6.24	4.04	13.17	11.39	18.63 ²
T5	15.21	7.17 ²	13.41	17.60 ³	14.43
T6	26.39 ¹	17.42	16.78	11.20	12.42
T7	12.07	30.34 ¹	11.91	25.80 ¹	19.72 ³

Explanations: **T1** – dynamic balance; **T2** - complex motor reaction capacity; **T3** – rhythmic capacity; **T4** - spatial orientation; **T5** - kinesthetic-differentiation capacity of legs; **T6** - kinesthetic-differentiation capacity of arms; **T7** – temporal parameters estimation.

 **Three most valid coordination abilities selected for the prediction equation with the specified rank⁽¹⁻³⁾**

In the prediction equations the following coordination capacities gain grounds: rhythmic capacity (T3), temporal parameters estimation (T7) and complex motor reaction speed (T2) (table 2). In handball players aged 11 till 15 we are able to predict overall coordination performance based on 3 selected coordination criteria

with a rather high level of reliability (58.25 – 74.43 %) and low level of error (1.704 – 2.284 points) (table 3). However, we have to take into consideration that the prediction equation is an equation for the prediction of performance, but not for reaching the result.

Table 3.

Regression equations for the prediction of coordination performance
in 11- to 15-year-old girls – handball players

Age	Regression equation	Performance (points)
11	$Y = 9.709 + 1.271 * X_{(T6)} + 1.171 * X_{(T3)} + 1.361 * X_{(T2)}$; SEy: 1.739; R ² : 74.43	20.35
12	$Y = 11.429 + 1.379 * X_{(T7)} + 0.886 * X_{(T5)} + 0.711 * X_{(T3)}$; SEy: 1.706; R ² : 61.34	20.86
13	$Y = 8.047 + 1.704 * X_{(T2)} + 1.492 * X_{(T1)} + 1.170 * X_{(T3)}$; SEy: 2.284; R ² : 65.96	21.16
14	$Y = 8.866 + 1.306 * X_{(T7)} + 1.728 * X_{(T2)} + 0.834 * X_{(T5)}$; SEy: 1.874; R ² : 61.99	20.94
15	$Y = 11.138 + 0.934 * X_{(T3)} + 1.167 * X_{(T4)} + 1.025 * X_{(T7)}$; SEy: 2.024; R ² : 58.25	20.34

Regression equation: $Y = b_0 + b_1 * X_{(T1)} + b_2 * X_{(T2)} + b_3 * X_{(T3)}$; SEy; R²; KV

Legend: Y = predicted coordination performance (points);

b_0 ; b_1 ; b_2 ; b_3 = regression coefficients according to table 2

$X_{(T1-T7)}$ = performance in the selected coordination tests (points);

SEy = regression equation error (points);

R² = regression equation reliability

Conclusions

1. In handball players aged 11-15 entropic processes of coordination abilities manifest themselves. These processes are characterized by an initial disordering and final orderliness of the system, they are dynamically changing depending on age and growth of sport performance. Within this developmental process, the importance and arrangement of individual factors of coordination performance change.

2. The most significant in the structure of coordination capacities in female handball are rhythmic capacity and capacity to estimate temporal parameters.

3. It is possible to predict coordination performance using rhythmic capacity, estimation of temporal parameters and complex motor reaction.

4. Prediction of overall coordination performance using the three selected coordination testing criteria seems to be satisfactory.

Recommendations for practice

- We recommend that the current sets of tests of special motor abilities used upon selecting talented youth into female handball classes. or upon continuous observing of special sport performance, be complemented by the following testing criteria: T3 – rhythmic capacity. T7 – temporal parameters estimation and T2 - complex motor reaction speed.
- When selecting coordination tests in higher age categories, we recommend to conform to the height of shares of individual coordination criteria in the structure of coordination performance.

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PSYCHOLOGICAL PROFILE OF ROMANIAN SPORTS MANAGERS IN AN INTERNATIONAL COMPARATIVE PERSPECTIVE

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ABSTRACT. *Introduction:* Generally managers have specific psychological characteristics. Among the social and psychological factors that differentiate the psychological profile of sports managers we can include the psychological characteristics. Personality traits have a certain contribution to the differentiation of psychological profile of sports managers, by the way of positive and negative psychological traits. These characteristics can be evaluated by using a well validated personality test, specific for the sport domain. *Objectives:* Our study tried to show the presence of some specific psychological traits in sports managers from Romania, in comparison with data obtained in Spain. Specifically we proposed to test the hypothesis of the existence of some differences concerning the psychological traits of sports managers from Romania in contrast with subject from other European countries. *Subjects and methods:* In our study we surveyed a sample of 200 sport managers from North-Western Region of Transylvania, Romania. On this sample we applied the Swedish personality instrument- Karolinska Scales of Personality (KSP) comprising 135 items and 15 scales. In the survey we distributed 310 questionnaires and only 200 were returned. *Results:* Romanian sports managers reported a higher level of social desirability, psychic anxiety, monotony avoidance, impulsiveness, inhibition of aggressiveness, and guilt in contrast with subjects from Spanish males from the normative sample for KSP in Spain. Muscular tension, indirect aggression, verbal aggression and irritability were lower in Romanian sports managers than in Spanish males sample. *Conclusions:* The psychological profile of sports managers shows some favorable differences concerning the level of socialization, muscular tension, verbal aggressiveness and educational level. In the same time, to the majority of other 15 scales of Karolinska Scales of Personality (KSP) we don't observed any important statistical differences between Romanian sport managers and subjects from Spain, Sweden. In sum, the psychological characteristics of Romanian sports managers are a little better than foreign subjects from available studies using KSP from Spain and Sweden.

Keywords: *Sports manager, comparative study, personality traits, KSP, positive psychological traits in managers, negative psychological characteristics in managers'*

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REZUMAT. Profilul psihologic al managerilor sportivi din România în context comparativ internațional. *Introducere.* Managerii în general se diferențiază prin trăsături psihice distincte. Printre factorii sociali și psihici care diferențiază profilul managerilor sportivi se află și apartenența religioasă. Spiritualitatea religioasă contribuie la diferențierea profilului psihologic al managerilor sportivi prin prisma trăsăturilor de personalitate pozitive și negative ce pot fi evaluate cu ajutorul unui test de personalitate validat, anume Scalele de Personalitate Karolinska (Karolinska Scales of Personality - KSP). *Obiective.* Am urmărit prezența unor trăsături psihice distincte la managerii sportivi din România în comparație cu studenții la medicină din Cluj-Napoca și cu subiecții din Spania și Suedia. În mod specific am propus ipoteza existenței unor diferențe cu privire la trăsăturile psihice ale managerilor români în comparație cu grupul de control al studenților și subiecții din studii similare din alte țări ce folosesc chestionarul KSP. *Subiecți și metode.* Am investigat un eșantion de 200 manageri sportivi din șase județe din Transilvania, Regiunea Nord-Vest. Au fost distribuite 310 chestionare, din care au fost returnate 250, din acestea 50 chestionare erau cu date incomplete ce le făceau inutilizabile în cadrul studiului. Au rămas 200 chestionare valide care au fost cotate și introduse în baza de date a studiului. Aceste date au fost grupate pe cele 15 scale ale chestionarului de personalitate Karolinska Scales of Personality (KSP). *Rezultate.* Managerii sportivi români au raportat scoruri mai ridicate la scalele de socializare, dezirabilitate socială, anxietate psihică, evitarea monotoniei, impulsivitate, inhibiția agresivității și sentimentul de vinovăție în comparație cu subiecții de gen masculin din eșantionul de validare a chestionarului KSP din Spania. Tensiunea musculară, agresivitatea indirectă, agresiunea verbală și impulsivitatea este mai redusă la managerii sportivi români în comparație cu cei din eșantionul masculin spaniol. *Concluzii.* În profilul psihologic al managerilor sportivi se evidențiază unele diferențe favorabile privitoare la gradul de sociabilitate, tensiunea musculară, agresivitatea verbală, impulsivitate și anii de școală terminați. La majoritatea celorlalte scale ale chestionarului Karolinska nu am obținut diferențe puternic semnificative între managerii sportivi români și subiecții din diferite eșantioane din studiile întreprinse cu KSP în Spania și Suedia. În general, caracteristicile psihologice ale managerilor sportivi români sunt puțin mai bune decât cele constatate la subiecții participanți la studiile disponibile din Spania și Suedia

Cuvinte cheie: manager sportiv, studiu comparativ, trăsături de personalitate, KSP, trăsături pozitive psihologice la manageri, caracteristicile psihologice negative ale managerilor

Introduction

Generally, sports managers are characterized by specific psychological traits. Among the positive psychological characteristics we can retain: decided, reliable, administrative capacities, intelligent, informed, efficient negotiator, plans ahead, good communicational abilities, honest, dynamic and teamwork spirit. The main negative attributes of a sport managers can be the following: brutal, egoistic, irritable, lonely, dictatorial, autocratic, non cooperative, and with low communicational abilities.

Objectives

We tried to show the presence of some differences in psychological characteristics between sport managers from Romania and other countries where the KSP was applied. Specifically we proposed the hypothesis of some differences in psychological traits of sport managers and medical students from Romania, Spanish males and females, Swedish delinquents and drugs addicts from Spain.

Specifically we proposed to test by empirical research the following hypothesis:

H1: The personality profile of managers is different in comparison with other non-sport subject from Romania and others foreign countries.

H2. The psychological profile of Romanian sport managers is better than that of drug addicts and delinquents.

Subjects and methods

In our study we surveyed a sample of 200 sport managers from North-Western Region of Transylvania, Romania. Their socio-demographic characteristics are presented in the following tables.

Table no.1.

Romanian sports managers by occupation.

Occupation	Number of cases	Percent (%)
Main coach	55	27,5
Sport director	38	19
Adjunct coach	30	15
President	21	10,5
Middle level manager	18	9
Professor of physical education and sport	14	7
General manager	9	4,5
Manager	4	2
Vice-president	4	2
Sport instructor	2	1
Secretary	2	1
Coach	1	0,5
Bookkeeper	1	0,5
Inspector	1	0,5

Table no. 2.

Sample structure by sport domain

Sport branches	Number of cases	Percent (%)
Basketball	16	30
Football	34	17
Handball	23	11,5
Volleyball	15	7,5
Athletics	8	4
Judo	6	3
Free style wrestling	6	3
Rugby	4	2
Polo	3	1,5
Box	3	1,5
Table tennis	2	1
Weight lifting	1	0,5
Taekwondo	1	0,5

On this sample we applied the Swedish personality instrument- Karolinska Scales of Personality (KSP) comprising 135 items and 15 scales. Personality traits were measured by the 135 questions Karolinska Scales of Personality (KSP) (Ortet & Torrubia, 1992), an inventory for assessing temperament traits associated with vulnerability for psychological deviance (Klinterberg et al., 1986). The 15 KSP scales are classified into five groups (Schalling, Asberg, Edman & Orelund, 1987, Vraști, 1990, 2001): impulsivity, psychopathy versus conformism, anxiety, hostility, and aggressiveness. We used the Romanian version of KSP validated in the studies by Vraști (1990, 2001)

The KSP comprises 135 items (with four-point Likert scale, from 1 Does not apply at all to 4 Applies completely) grouped into 15 scales (Schalling et al., 1987):

1. *Psychic anxiety* (10 items). Worry, insecurity, and anticipatory and social anxiety. Sample item: It takes me an unusually long time to get over unpleasant events.

2. *Somatic anxiety* (10 items). His content refers to autonomic symptoms, concentration difficulties, vague distress, and panic. Sample item: My heart sometimes beats hard or irregularly for no real reason.

3. *Muscular tension* (10 items): Tenseness in the muscles, trembling, feeling stiff, and gnashing jaws. Sample item: My hands usually tremble.

4. *Psychasthenia (lack of energy)* (10 items). Being easily fatigued, and feeling uneasy when urged to speed up and face new tasks. Sample item: I think I get fatigued more easily than most people I know.

5. *Inhibition of aggression (lack of assertiveness)* (10 items): Nonassertive, sad rather than angry when scolded, and cannot speak up. Sample item: I find it difficult going back to a store to ask if I can exchange an item I have bought.

6. *Detachment (distance)* (10 items): Avoiding involvement in others, withdrawn, and schizoid. Sample item: I consider myself reserved and a little cold rather than kind and warm.

7. *Impulsiveness* (10 items): Acting on the spur of the moment, nonplanning, preference for speed rather than accuracy, and care-freeness. Sample item: I usually talk before I think'.

8. *Monotony avoidance (sensation seeking)* (10 items). Avoiding routine, thrill seeking, and need for change and action. Sample item: I am always keen on trying out things that are all new.

9. *Socialization* (20 items). Positive childhood experiences, good school and family adjustment, and general satisfaction. Sample item: My home life was always happy.

10. *Indirect aggression* (5 items). Sulking, and slamming doors when angry. Sample item: When I am mad, I sometimes slam doors.

11. *Verbal aggression* (5 items). Getting into arguments and telling people off when annoyed. Sample item: I can't get into arguments when people disagree with me (reverse scored).

12. *Irritability* (5 items): Irritable and lacking of patience. Sample item: I am irritated a great deal more than people are aware of.

13. *Suspicion* (5 items): Suspicious and distrusting people's motives. Sample item: I sometimes have the feeling that others are laughing at me.

14. *Guilt* (5 items): Remorseful, and ashamed for bad thoughts. Sample item: The few times I have cheated, I have suffered unbearable feelings of remorse.

15. *Social desirability* (10 items). Responding in a socially approved way, socially conforming, friendly, helpful, faking good. Sample item: I have never deliberately said something that has hurt someone's feelings

Results

Table no. 3.

Descriptive statistics for the quantitative variables of the Romanian sample

<i>Variables KSP</i>	<i>Mean</i>	<i>Standard deviation</i>	<i>Mean per item</i>	<i>Normality test q</i>
1. Indirect aggression	10,72	2,77	2,14	4,69 N
2. Verbal aggression	13,21	2,70	2,64	4,81 N
3. Irritability	11,03	2,66	2,21	4,51 ?
4. Psychic anxiety	24,72	4,73	2,47	5,71 N
5. Somatic anxiety	19,23	5,98	1,92	4,35 ?
6. Detachment (distance)	22,32	3,54	2,23	5,38 N
7. Social desirability	30,30	4,18	3,03	5,50 N

<i>Variables KSP</i>	<i>Mean</i>	<i>Standard deviation</i>	<i>Mean per item</i>	<i>Normality test q</i>
8. Monotony avoidance	25,83	4,02	2,58	5,22 N
9. Impulsiveness	22,17	5,17	2,22	5,22 N
10. Inhibition of aggression (lack of assertiveness)	25,66	3,49	2,57	4,87 N
11. Psychasthenia (lack of energy)	23,26	3,65	2,33	5,19 N
12. Socialization	54,91	6,45	2,75	5,12 N
13. Suspicion	11,41	2,38	2,28	5,04 N
14. Muscular tension	16,75	4,96	1,68	4,84 N
15. Guilt	13,88	2,38	2,78	5,04 N
16. Years of education completed	16,12	2,28	-	4,82 N
17. Age	44,63	8,85	-	4,41 ?

As we can see in the content of table no. 3, all the values for the normality test q (I. Lupu, 1999), that are marked by N show that these variables had a normal distribution, but the ones marked by ? don't have a normal distribution. In a few cases marked by? it is impossible to apply parametric tests, which are more robust. In the case of normal distributed variables, it is possible to use parametric tests like Student and ANOVA (Analysis of Variance).

The highest mean values per items to the KSP scales were obtained for: social desirability, guilt, socialization, verbal aggression, and monotony avoidance. By contrast, the lowest values were obtained for the following scales: muscular tension, somatic anxiety, indirect aggression, irritability, and impulsiveness, all being negatives aspect of sport managers' personality.

Table no. 4.

Comparison of KSP values between Romanian sport managers with Spanish and Swedish subjects

KSP scales and variables	Sports managers Romania (N=200)	Spanish males (N=111)	Spanish females (N=388)	Working women Sweden (N=101)	Delinquent males Sweden (N=55)	<i>Drugs addicts Spain (N=142)</i>
1. <i>Indirect aggression</i>	<i>10,72</i>	13,75	13,48	12,40	<i>14,49</i>	11,42
2. Verbal aggression	13,21	14,18	13,57	11,45	<i>16,98</i>	12,84
3. Irritability	11,03	12,12	12,11	10,70	<i>12,91</i>	11,82
4. Psychic anxiety	24,72	24,27	<i>25,79</i>	20,80	<i>19,64</i>	24,03

KSP scales and variables	Sports managers Romania (N=200)	Spanish males (N= 111)	Spanish females (N= 388)	Working women Sweden (N= 101)	Delinquent males Sweden (N= 55)	<i>Drugs addicts Spain (N = 142)</i>
5. Somatic anxiety	19,23	21,02	23,81	17,30	19,73	21,74
6. Detachment (distance)	22,32	22,42	20,97	19,30	24,31	23,42
7. Social desirability	30,30	26,52	27,05	28,90	23,29	27,06
8. Monotony avoidance	25,83	25,42	26,06	23,00	31,53	25,49
9. Impulsiveness	22,17	23,89	23,46	23,60	28,49	23,19
10. Inhibition of aggression (lack of assertiveness)	25,66	24,31	26,00	22,70	17,20	25,71
11. Psychasthenia (lack of energy)	23,26	23,69	25,38	20,60	21,31	23,72
12. Socialization	54,91	55,14	55,31	60,54	46,38	49,30
13. Suspicion	11,41	11,47	11,67	9,10	11,65	11,91
14. Muscular tension	16,75	18,83	21,40	18,20	17,71	20,76
15. Guilt	13,88	12,69	13,02	11,65	11,31	12,78
16. Years of education completed	16,12			12,5(±2,2)		
17. Age	44,63			44 (± 8,3)		

As we can see, concerning the negative personality traits, the more striking differences are between Romanian sports managers and Swedish delinquent males, who are worse of than sport managers in the following characteristics: verbal aggression, indirect aggression, irritability, detachment, monotony avoidance and impulsiveness. In the same time, Swedish working women show a better psychological profile in contrast with Romanian sport managers concerning: monotony avoidance, socialization (highest in all samples), and suspicion. Delinquent Swedish males and drugs addicts from Spain, as expected, reported the lowest degree of social integration or socialization.

In comparing the psychological profile of Romanian sport managers with the medical students from Cluj-Napoca we observed a very similar pattern of psychological characteristics the two profiles being quite identical. However sports managers have a little higher level on somatic anxiety, monotony avoidance and impulsivity in contrast with medical students. These differences are generally normal because the sport managers were before participants in higher level sport competitions, normally with a higher level of sensation seeking, and a higher level of courage. These differences are visible in the fig. no. 1.

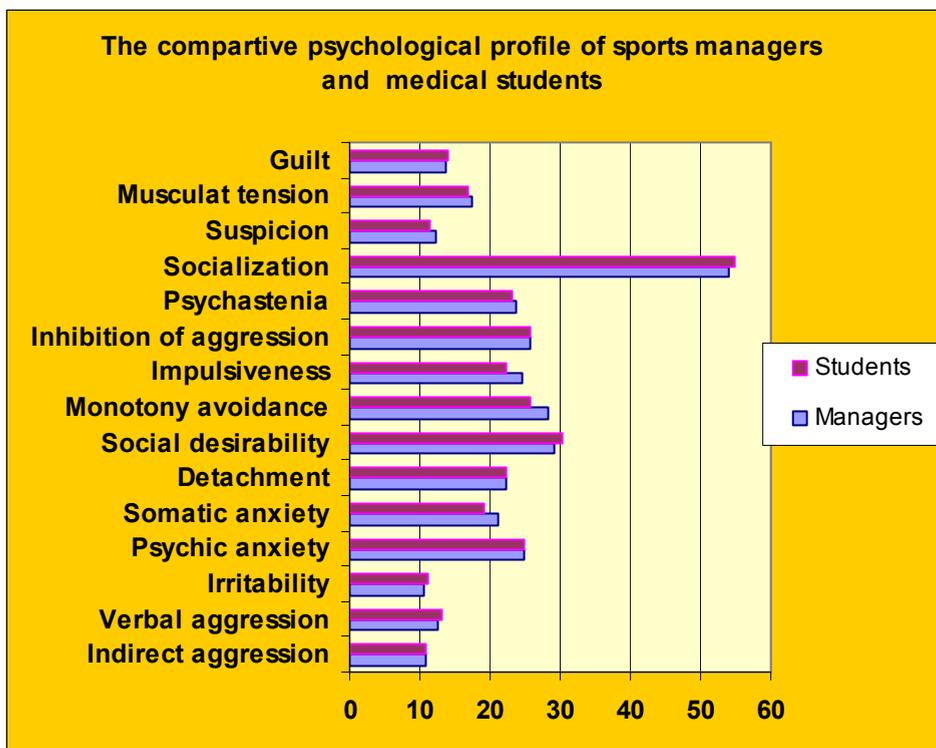


Fig. no. 1. The bar chart of the differences in mean raw scores to the Karolinska Scales of Personality between sports managers and medical students from Romania.

Sports managers from North-Western region of Romania reported lower raw scores in contrast with Spanish males from the normative sample used for the validation of KSP on Spanish population. Specifically, Romanian managers have lower scores on indirect aggression, verbal aggression, verbal aggression, irritability and muscular tension. In the same time, Romanian managers reported higher raw scores on the scales of psychic anxiety, social desirability, monotony avoidance, impulsiveness, and guilt feelings. The level of social integration of sport managers is lower than in Spanish male's counterpart. These aspects can be easily seen in the figure no. 2.

As we can notice, there are some differences between the psychological profile of Swedish delinquents and Romanian sports managers, who reported higher level of socialization, guilt feelings, inhibition of aggression, social desirability and, psychic anxiety. By contrast, the sample of Swedish delinquents has higher mean raw scores on indirect aggression, verbal aggression, detachment, and monotony avoidance. From these data, we can conclude that the psychological profile of Romanian sports

managers is better than the profile of Swedish delinquents. Sports managers have then a better ability to make and sustain social contacts, and better communicational abilities than their Swedish counterparts.

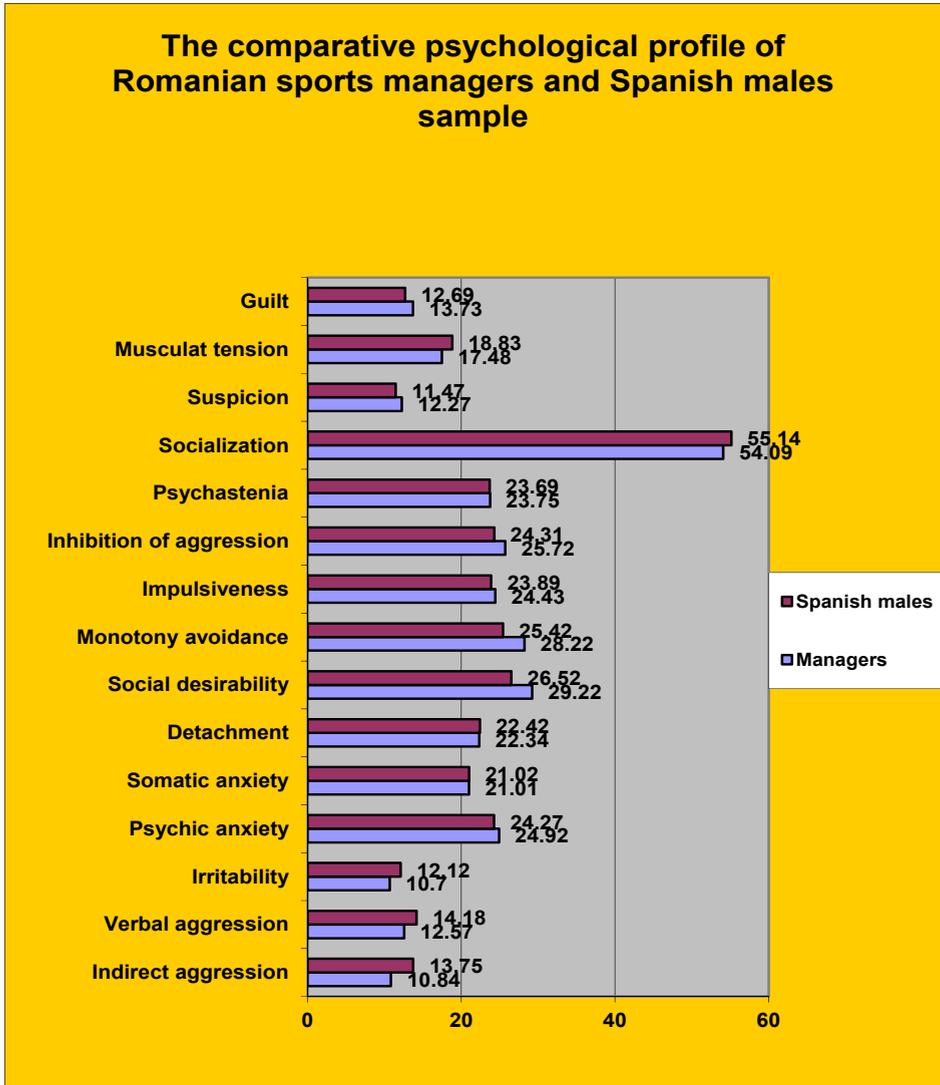


Fig. no. 2. Bar chart of the differences of mean raw scores to the Karolinska Scales of Personality between sports managers and Spanish males' normative sample.

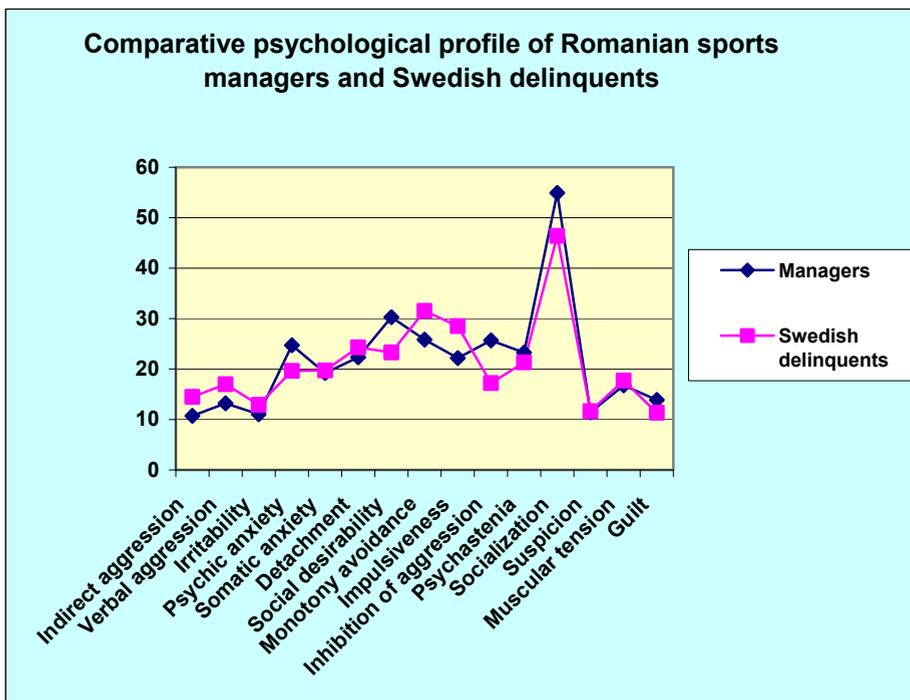


Fig. 3. Frequency polygon of the differences in mean raw scores to the Karolinska Scales of Personality between Romanian sports managers and Swedish delinquents

Discussions and conclusions

The scales of KSP that measure positive aspects of sport manager’s personality had the highest values, and to the scales dedicated to measure negative aspects of managers personality were obtained lower values. That’s means the Romanian sports manager had predominantly positive psychological characteristics.

Although there isn’t one distinct set or essential core personality traits that assure a person is or will be a successful manager, there are some key characteristics, presented by Parcells Bill in *Finding a Way to Win* (1995, in Weinberger, 2003, pag. 214). Among them the most important ten are:

Integrity- the opinions and values of a sport manager must be resistant to outside pressure and for long time.

Flexibility – departure from traditions

Loyalty – promote collective loyalty or teamwork.

Confidence – to build confidence in your players and coaching staff,

Accountability – sports managers must take full responsibility in their activity.

Candor – when sending a message, it's not enough to be honest and accurate, you must be also emotional in tone.

Preparedness – to plan ahead for all contingencies including ones who can be unlikely or distasteful.

Resourcefulness - refusal to quit or give in when all seems bleak.

Self-discipline – strict adherence to a calculated plan.

Patience – it's not enough to know what changes must be made; it's equally important to decide when to make them.

The certitude and solidity of our study can be proved and enhanced by reporting the Cronbach α internal reliability coefficient (Cronbach, 1951). Using the module of scale reliability of Statistical Package for the Social Sciences (SPSS version 17.0) we obtained the following Cronbach α coefficients, that were put also in an comparative perspective as can be seen in the Table no. 5.

Table no. 4.

Comparative Cronbach reliability levels to the scales of KSP

KSP scales	Romanian sports managers (N = 200)	Spanish males (N = 111)	Spanish females (N = 388)	Swedish healthy working females (N = 101)
1. Indirect aggression	0,48	0,55	0,54	0,61
2. Verbal aggression	0,36	0,67	0,63	0,36
3. Irritability	0,37	0,55	0,46	0,46
4. Psychic anxiety	0,65	0,75	0,73	0,84
5. Somatic anxiety	0,78	0,76	0,77	0,83
6. Detachment	0,49	0,58	0,62	0,69
7. Social desirability	0,55	0,67	0,61	0,56
8. Monotony avoidance	0,57	0,76	0,77	0,80
9. Impulsiveness	0,58	0,58	0,67	0,69
10. Inhibition of aggression	0,31	0,69	0,56	0,44
11. Psychasthenia	0,53	0,66	0,56	0,75
12. Socialization	0,62	0,76	0,77	0,87
13. Suspicion	0,33	0,48	0,42	0,39
14. Muscular tension	0,75	0,78	0,81	0,83
15. Guilt feelings	0,39	0,35	0,36	0,10

As we can see, acceptable reliability levels were obtained to the scales of psychic anxiety, somatic anxiety, impulsiveness, and socialization. Better reliability coefficient were obtained in the Spanish and Swedish studies. The acceptable values for Cronbach α are in the range of 0,70-1,00 (cf. Lupu, 1999.)

May be, in a future study dedicated to the investigation of the of country characteristics of psychological characteristics of sport participants, a change in the study design will be needed, by using studies dedicated to the psychological profile of sport managers in other countries of the world, specifically from Europe, North America, and Asia. We speculate that in this case, the results will be more accurate, pertinent, and meaningful.

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THE ERRORS IN COMMUNICATION INFLUENCE ON THE EFFICIENCY OF PHYSICAL EXERCISES

PRODEA COSMIN¹, PĂTRAȘCU ADRIAN²

ABSTRACT. *Background.* The need to continuously improve the motoric learning led up to an increased attention towards the mental algorithms that influence learning. The use of operant conditioning in sports requires a special attention due to the fact that the subject is a group, not a single person, and therefore the need to identify the affinity of the group towards this type of learning appears. *Aims.* The aims of the study were: 1. Identifying the meaning of some verbal commands received by the receiver. 2. Linking the meanings understood by the receiver with the original meanings sent out by the sender. 3. Comparing the meanings of the commands at the start and at the end of the experiment as understood by the receiver. 4. Identifying the answer efficiency towards some commands during an actual physical test. *Methods.* We used beginning and final test worksheets and an actual exercise course test with the emphasis on the reaction towards commands. *Results.* After gathering the data we ended up with: a). from the initial test 1 correct answer, 15 partial answers and 29 incorrect answers; b). from the final test 21 correct answers, 12 partials and 12 incorrect. The test course gave us 16 correct executions for “Move!” (“Misca-te!”) command, 35 correct for “Sideline!” (“Tusa!”) command and 11 for the “Go!” (“Pleaca!”) command from a total of 42 executions. *Conclusions.* After the analysis and interpretation of data we could identify a strong affinity of the group towards the reinforcements that aim to prevent any mistakes. Furthermore, the data gathered made it possible to identify a functioning pattern between two of study variables: positive reinforcements and positive technical instruction.

Keywords: communication, basketball, physical education, sport, psychology, error.

REZUMAT. Eficiența exercițiilor fizice complexe influențată de erorile în comunicare. *Premize.* Nevoia de îmbunătățire permanentă a metodelor de învățare motrică a determinat preocuparea oamenilor de știință pentru înțelegerea mecanismelor cognitive precursore ale învățării în general. Învățarea stimul-răspuns, sau cu alte cuvinte, condiționarea operantă, utilizată în mediul sportiv necesită o atenție deosebită datorită caracteristicilor grupului căruia i se aplică acest tip de învățare, apărând astfel nevoia de identificare a nevoilor și afinităților grupului către acest tip de învățare. *Obiective.* Obiectivele studiului au fost: 1. Identificarea sensurilor unor comenzi percepute de receptor. 2. Relaționarea sensurilor percepute cu sensurile atribuite inițial de emițător. 3. Compararea sensurilor percepute de la începutul și sfârșitul

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experimentului. 4. Identificarea eficienței răspunsului la anumite comenzi în cadrul unui test practic. *Metode.* S-au completat fișe test inițiale precum și fișe test finale, coroborate cu un complex de exerciții practic. *Rezultate.* În urma strângerii datelor din fișa test inițială s-au obținut: 1 răspuns corect al definițiilor comenzilor, 15 răspunsuri care corespund parțial cu definițiile comenzilor și un număr de 29 răspunsuri care nu corespund deloc cu definițiile. În ceea ce privește fișa test finală aceste date sunt cum urmează: 21 răspunsuri care corespund în totalitate, 12 care sunt parțiale și 12 care nu corespund deloc. Testul practic a concretizat un număr de 16 execuții corecte pentru comanda „Mișcă-te!”, 35 pentru „Tușă!” și 11 pentru „Pleacă!” dintr-un total de 42 de execuții. *Concluzii.* Procesul percepției are loc și atunci când semnalele sunt necunoscute, dar acesta trebuie relaționat cu înțelegerea, ca element indispensabil care completează percepția, numai atunci când, pe baza experiențelor anterioare, semnalele verbale pot fi decodate și în felul acesta informația pe care o poartă aceste semnale devine accesibilă destinatarului, cu alte cuvinte sensurile comenzilor sunt înțelese numai atunci când bagajul cunoștințelor elevilor se suprapune cu bagajul folosit de profesor pentru emiterea mesajului.

Cuvinte cheie: comunicare, educație fizică, sport, psihologie, didactică, erori

Background

The study was made with the aim to identify the level of the effects generated by the errors in communication, effects that influence the physical exercise.

Thorndike lies down his theory regarding learning called „connectionism” (Hergenhahn 2005). In this theory, he arguments that the process of learning is based on connections that form in the brain. The law of effect is the most important connection: when a link is followed by a satisfaction, it becomes stronger; but when it’s followed by dissatisfaction it becomes weaker. (Roșca, 1966).

One of the psychologist that put an emphasis on reinforcing during learning was Skinner (Dumitrescu 1979). In his work he supports the need to difference two types of conditioned reflexes. S type reflexes, in which the reinforcement is conditioned by the appearance of a stimuli, and R type reflexes, in which an answer is triggered to make the stimuli appear. This type of conditioning (type R) was named operant conditioning. (Epuran, 2001).

Gagné identifies five types of learning, which he ranks according to their complexity:

- a) Motor skills (refers to bodily movements involving muscular activity. Examples might be: Starting a car, shooting a target, swinging a golf club.);
- b) Attitude (is an internal state which affects an individual’s choice of action toward some object, person, or event. Examples might be: Choosing to visit an art museum, writing letters in pursuit of a cause);
- c) Verbal information:

a. Labels and facts (refer to naming or making a verbal response to a specific input. The response may be naming or citing a fact or set of facts. The response may be vocal or written. Examples: Naming objects, people, or events. Recalling a person's birthday or hobbies. Stating the capitals of the United States.)

b. Bodies of knowledge(refers to recalling a large body of interconnected facts. Example: paraphrasing the meaning of textual materials or stating rules and regulations. Example: Paraphrasing the meaning of textual materials. Stating rules and regulations.)

d) Cognitive strategy (is an internal process by which the learner controls his/her own ways of thinking and learning. Example: Engaging in self-testing to decide how much study is needed; knowing what sorts of questions to ask to best define a domain of knowledge; ability to form a mental model of the problem);

e) Intellectual skills:

a. Discrimination (is making different responses to the different members of a particular class. Seeing the essential differences between inputs and responding differently to each. Example: Distinguishing yellow finches from house finches on the basis of markings; having to tell the differences between gauges on an instrument panel.);

b. Concrete concept(is responding in a single way to all members of a particular class of observable events. Seeing the essential similarity among a class of objects, people, or events, which calls for a single response. Example: Classifying music as jazz, country western, rock, etc.; saying "round upon seeing a manhole cover, a penny, and the moon.);

c. Rule learning(is applying a rule to a given situation or condition by responding to a class of inputs with a class of actions. Relating two or more simpler concepts in the particular manner of a rule. A rule states the relationship among concepts. Examples: It is helpful to think of rules or principles as "if-then" statements. "If a task is a procedure, then use flowcharting to analyze the task." "If you can convert a statement into an 'if-then' statement, then it is a rule or principle.");

d. Problem solving(is combining lower level rules to solve problems in a situation never encountered by the person solving the problem. May involve generating new rules which receive trial and error use until the one that solves the problem is found.) (Gagné, 1965).

As a process, communication implies a succession of the coding, recoding and decoding processes. Through this process information is sent so that certain aims can be fulfilled.(Cracium, M.2005)

The elements that sum up the communication process are:

- The Sender and the Receiver
- The Channel
- The Input and Output
- The Code
- The Feedback
- The nature of the communication (Rosca,A, 1966)

Human mind, based on the stimuli retrieved from the outside world, has a map of the reality, which contains all the independent decoding and interpretation of the world. This map is not the real world; it just has a structure similar with the world which helps explain what is actually happening in it. The making of this map is conditioned by some processes, which make it unique and different from maps of other living beings:

- Selection
- Distortion
- Generalization

The same mechanisms activate when there is a verbal communication or for a verbal describing of a personal interpretation of the world. It is vital to have a linguistic instrument, which can allow us, beyond the processes of selection, distortion and generalization, to recover the sensory experience, which is the root of a specific affirmation. (Dumitrescu, G. T., 1979)

The communication process can be blurred by the appearance of some barriers, which diminishes, amplifies, stumbles or deforms the messages:

- At the level of the Sender and the Receiver:
 - Output and input deficiencies;
 - Emotion and attitude deficiencies;
 - Stereotype thinking
- at the level of the channels: the information sent on one type of channel is received on another type of channel.
 - at the level of the message:
 - Using words with different meanings;
 - Using vague personal expressions that are not fully understood by the others involved in communication.
 - at the level of the nature of the communication:
 - A nature(environment) that is polluted by other signals (phonic, visual etc.) (Craciun, M., 2005)

An efficient communication implies that both dynamic parts of the process should have the ability and the resources to carry of the process. It is complex and often it is blurred or error prone. Either the emitter or the receiver causes these errors.

Hypothesis

Identifying how the errors in communication influence the efficiency of complex skill course.

Methods and materials

Subjects

The subjects of this study were 16 women between the ages of 10 and 11 years old.

Methods

For obtaining the data we used two methods: the filling a test chart by the subjects and a complex skill course that the subjects had to complete.

The complex skill course that the subjects had to complete was composed of three parts linked together, in each of these parts a command was emitted and was recorded the reaction of the students to these commands. The recording was focused on the number of correct reactions to the commands during the course.

The test chart that the subjects had to fill consisted of the commands that were used during the skill course and was intended to offer valuable information regarding the understanding of these commands, by comparing the answers from the subjects to the answers that the coach gave, thus identifying if some errors in communication were present.

After the study was finished we gave our subjects another chart to fill in with the same commands, but each one had another word added so that more information was offered to the test subjects. This testing was necessary to identify the level of the error present.

Processing the data

We used the formula for the simple arithmetic average to obtain the values of the variables we were interested in as a part of a whole, thus giving us a way to identify the value of these variables in a procentual way.

$$M_x = \frac{\sum x_i}{N}$$

M_x = the average values of variable „x”

X_i = the value of variable „x” during the moment „i”

$\sum x_i$ = the values total sum of the variable „x”

N = the number of total recordings of the variable „x”

Results

The procentual values of the gathered data were arranged in tables.

Tabel No. 1

The procentual values of the answers to the initial test chart

Command Name	True Answers	Partial Answers	False Answers
„Mișcă-te!” (“Move!”)	0.00	0.00	100.00
„Pleacă!” (“Go!”)	6.67	13.33	80.00
„Tușă!” (“Sideline!”)	0.00	86.67	13.33

Tabel No. 2

The procentual values of the answers to the final test chart with extra information for each command

Command Name	True Answers	Partial Answers	False Answers
„Mișcă-te! Picioarele” (“Move the legs!”)	33.33	6.67	60.00
„Pas! Pleacă!” (“Pass! Go!”)	93.33	0.00	6.67
„Tușa! Pas!” (“Sideline! Pass!”)	13.33	73.33	13.33

Tabel No. 3

The procentual values of the complex skill course test

	„Mișcă-te!” (“Move!”)	„Tușa!” (“Sideline!”)	„Pleacă!” (“Go!”)	Total number of runs
Successful	16	35	11	42
Percentage	38.10	83.33	26.19	

Discussion of the results

After the study we can lay down some conclusions:

- The assimilation of the meanings of the commands is not directly linked to the command-execution conditioning.
- The assimilation of the meanings is related to the emitting coherence of the commands and with an adequate level of the perception.
- Some commands have a predisposition to produce errors in coach-athlete communication due to the lack of information sent.
- The results of the complex skill course are close to those of the final test chart, the one with extra information for each command.

At the end of the research, the level of understanding the commands has risen, which is a success that can become the starting point for a future study for identifying a better and more efficient algorithm for using the commands.

Another major and interesting aspect of this study is that it opens the road to identify a direct link between the received meanings of the words and the way of conditioning.

The hearing as a process of decoding of the verbal signals is linked to all the other processes of the language; it sometimes doubles the speaking process, becoming an important aspect of the error avoidance processes.

The possibility to react by emitting an answer to a new situation grants verbal communication the context to become a vital element in the physical education domain. Even though it requires a huge variety of terms unique to this domain, understanding them is made relatively easy due to the lexical flexibility of the language in which the explication is made. This characteristic allows the physical education domain to be open to a large number of groups regardless of the characteristics of each group. Another important element of verbal communication is the style. The most important style of communication in physical education is clarity, which means that the terms and words used must be carefully selected, exact and right for the ideas they sum up, they must be logically linked. Also these words and terms used must be chosen so that the most majority of them are not from the foreign, scientific or regional groups of words.

The verbal communication spreads over the group dynamic of each physical activity available due to the presence of the triangle transmission-perception-understanding that affects the dynamic of the message.

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BODY IMAGE PERCEPTION IN YOUNG PEOPLE

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POP N. HORĂȚIU¹, ANDRÁS ÁLMOS¹,
NUȚ ANCUȚA¹, VĂIDĂHĂZAN REMUS¹

ABSTRACT. Introduction. Body image is a frequent term nowadays, when each individual tries to display a body image as close as possible to that of a model promoted by the society or by the media, which can ensure, indirectly, success in a field of activity. **Objectives.** The purpose of this study is to find out students' concerns over their own body image. **Method and Materials.** 311 students were interviewed in this study, all from different faculties of Babeș-Bolyai University, their average age was 20.11. The students filled out an adapted questionnaire containing 11 questions about body image perception. **Results and Conclusions.** In general, young people are concerned with the way in which they appear in front of others, girls are more careful with what they wear so as not to look overweight. Most of the respondents wish to change something in their own body, but this is more obvious among girls.

Keywords: *students, body image, perceptions, overweight.*

REZUMAT. Tinerii și percepția imaginii corporale. Introducere. Imaginea corporală este un termen frecvent întâlnit în zilele noastre, când fiecare individ încearcă să afișeze o imagine corporală cât mai aproape de cea a unui model promovat de societate sau de sfera media, ce poate să-i asigure, indirect, succesul într-un domeniu de activitate. **Obiective.** Prin studiul de față ne propunem să obținem o serie de date cu privire la preocupările studenților față de propria imagine corporală. **Materiale și metode.** La acest studiu au participat 311 studenți, la diferite facultăți, din cadrul Univ. Babeș-Bolyai, media vârstei acestora fiind de 20.11 ani. Studenții au răspuns unui chestionar, adaptat, ce conține 11 întrebări legate de percepția imaginii corporale. **Rezultate și concluzii.** Tinerii, în general, sunt preocupați de felul în care apar în fața celorlalți, fetele fiind mai atente la ce haine îmbracă pentru a nu arăta supraponderale. Majoritatea respondenților doresc, să schimbe câte ceva la propriul corp, însă acest aspect este mai evident în rândul fetelor.

Cuvinte cheie: *studenți, imagine corporală, percepții, supraponderal.*

Introduction

The term “body image” is more and more commonly seen in contemporary society, especially in developed countries, where individuals have become increasingly concerned about the image that they display in front of other peers. Numerous studies

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(Kostanski & Gullone, 1998; Grogan, 1999, according to Birbeck and Drummond, 2005) stress the connection between dissatisfaction with self-image and depression or anxiety. Moreover, a negative body image induces progressively, especially among women, the phenomenon that experts call food disorder.

According to other authors (Baylei, 2008), body image has a predominantly psychological nature involving a series of images, perceptions, physical sensations that we have towards our own body. An individual's self-esteem has a particular influence on the construction of his/her own body image, which is more important than way the others view the appearance of the same individual.

Objectives

The purpose of this study is to analyze the opinion of young people/students on the way in which they perceive their own body image in relation to the environment and to other individuals close in age.

Materials and Methods

The 311 participants in the study are students from several faculties, which belong to Babeș-Bolyai University, having an average age of 20.11 ± 2.241 . The order of the faculties, according to the total number of students involved, is as follows: Faculty of Psychology and Educational Sciences, Faculty of Letters, Faculty of Physical Education and Sports, Faculty of Orthodox Theology, Faculty of History, School of Drama, Faculty of Geography. Most of the respondents come from urban areas. The participants were asked to fill out a body image-related questionnaire, translated and adjusted, called BIQ (body image questionnaire), containing 11 questions.

Results

Of the 311 respondents, 166 are female and the rest of 145 are male (chart no. 1), while the average age (chart no. 2) is 20.11 ± 2.241 .

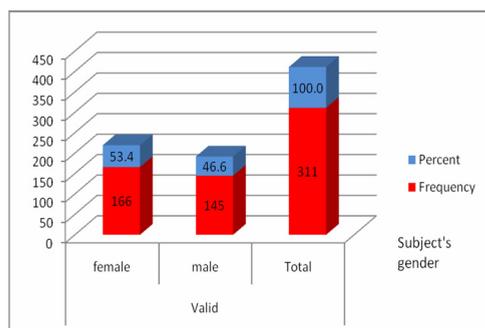


Chart no. 1. Subjects' gender

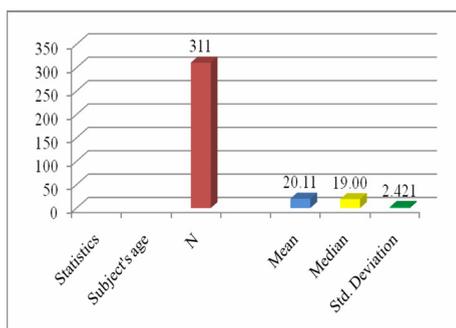


Chart no. 2. Subjects' age

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As we underlined earlier, the students recruited in this study come from several faculties, as shown in chart no. 3.

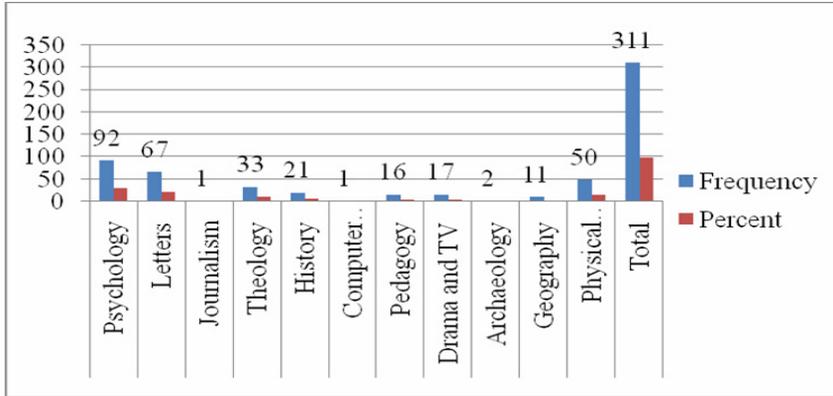


Chart no. 3. Distribution of students per faculties

At item I, represented chart no. 4, regarding the avoidance of sports clothing/sports apparel in front of the others, most people, both female (148) and male (142), responded negatively. In this case, the “chi²” values are low, therefore the gender difference is significant.

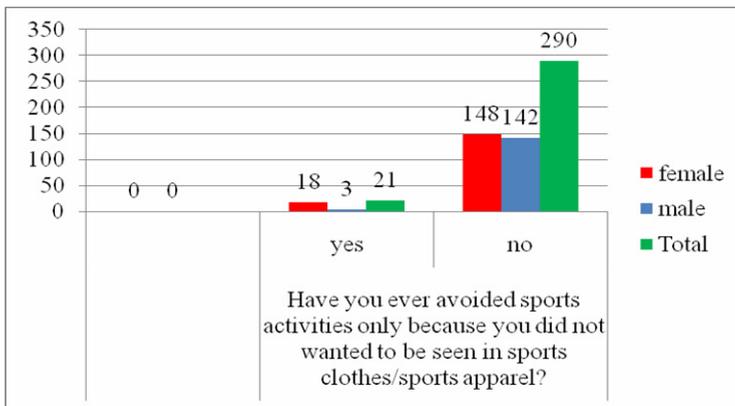


Chart no. 4. Reluctance to wear sports apparel in front of the others

At item II (chart no. 5), where the question was related to food consumption and its connection to the risk of overweight, most subjects (143 girls and 141 boys) responded negatively. However, the number of girls concerned with overweight is higher than the number of boys.

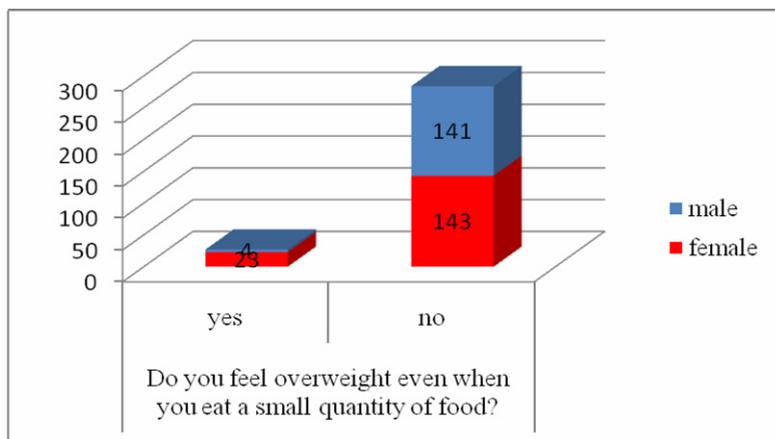


Chart no. 5. Food consumption and sensation of overweight

Asked if they were reluctant to appear in certain locations (chart no. 6) because they felt overweight, most respondents answered negatively, both girls and boys.

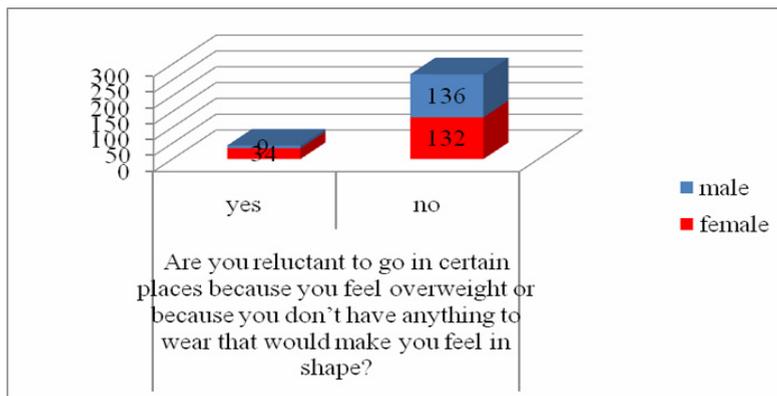


Chart no. 6. Reluctance to appear in certain locations because of overweight

Questioned whether they were worried about their height or if they thought that they did not look good enough (chart no. 7), most of the students responded negatively. However, we must emphasize that the number of girls worried about their looks is much higher than the number of boys.

BODY IMAGE PERCEPTION IN YOUNG PEOPLE

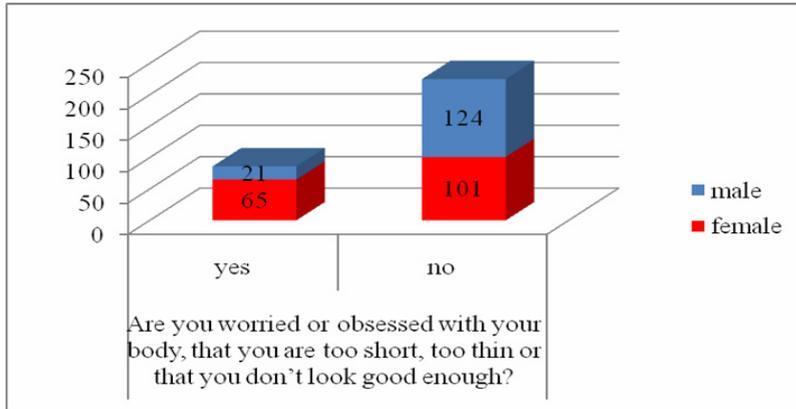


Chart no. 7. Concern about height or looks

When the subjects were asked about their perception of muscular or toned body (chart no. 8), the girls (78), almost half of the total number of respondents, were concerned that they did not have toned muscles.

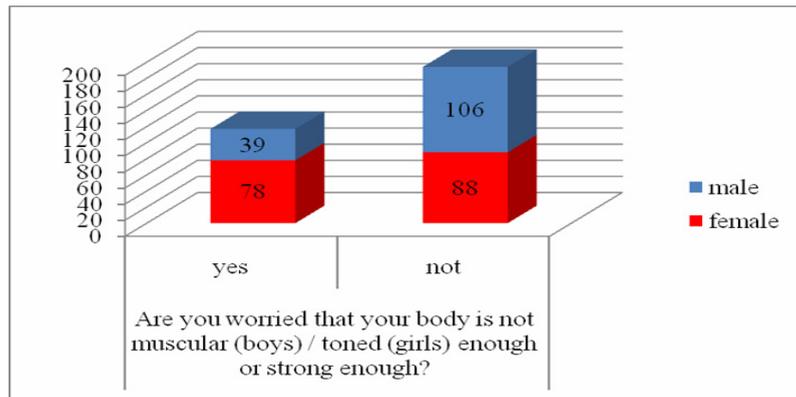


Chart no. 8. Concern about toned body

The obtained data (chart no. 9) show that girls are more worried about displaying an overweight image, thus a larger number of girls (64) than boys avoid wearing clothes in which they might look overweight.

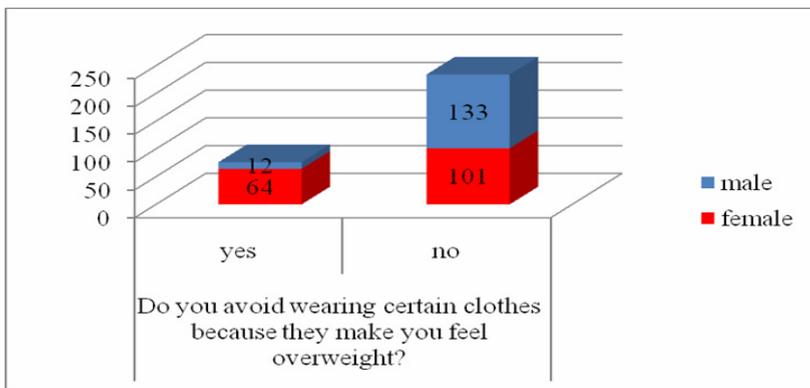


Chart no. 9. Attention to clothes so as not to look overweight

Even if they are not satisfied with their appearance, most respondents like with their own image, as shown in chart no. 10

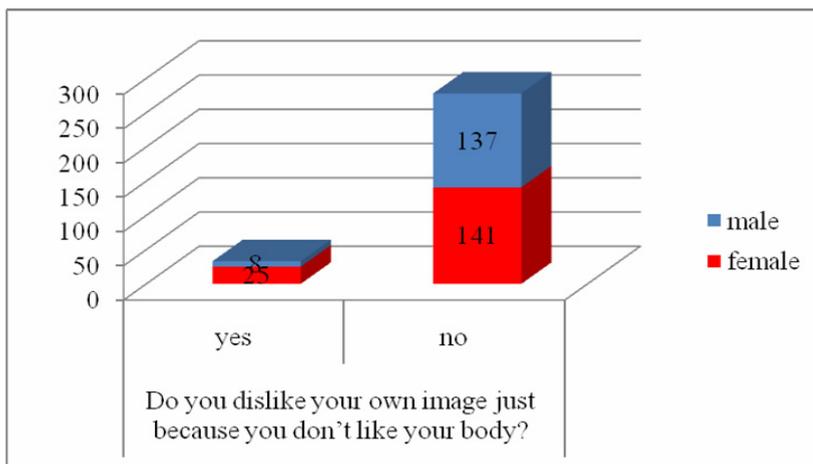


Chart no. 10. Relationship with self-image

Although the number of those who do not like their body is quite low (36 girls and 19 boys), most of them (87 boys and 132 girls) would like to change something in their body, as shown in charts no. 11 and 12.

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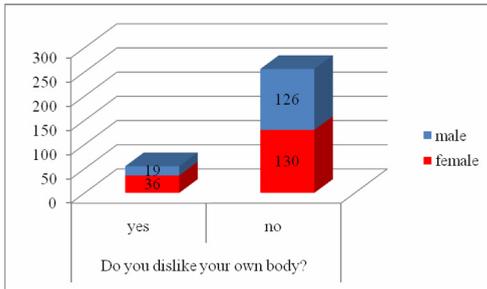


Chart no. 11. Liking of their own body

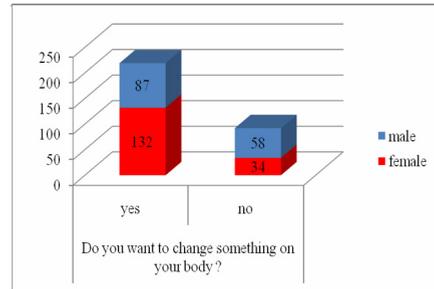


Chart no. 12. Wish to change something in their own body

According to the data analysis (chart no. 13), the last question, which focused on the comparison that individuals make between themselves and other peers, shows that girls (116 compared to the rest of 50 who answered negatively) relate more frequently their body image to the others, while boys are more reserved in this respect, as they are satisfied with their body image.

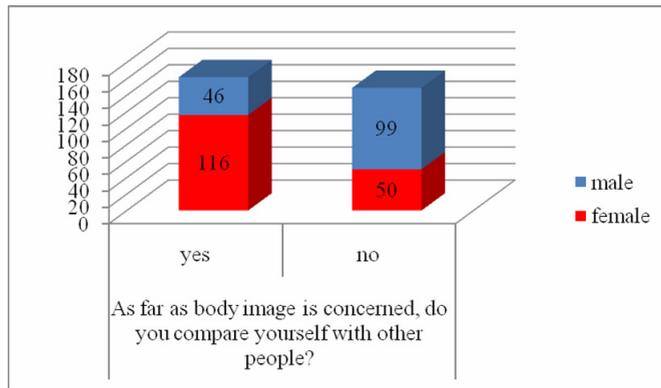


Chart no. 13. Comparison of self body image with that of other peers

Discussions

In the specialty literature, Bailey (2008) synthesizes a series of statistical data which show that approximately 80% of the questioned women are dissatisfied with their body image. Most of the times, body image is distorted by the presence of extra pounds. A large number of respondents follow a diet, 38% of men and 68% of women who participated in the study. In our study, the data show that girls are more concerned about their bodies than boys, being more concerned and more careful about what they eat and how they dress so as not to display an overweight body image.

Conclusions

1. Generally, young people are concerned about the way they look, but not too concerned because the risk of overweight is quite low at their age. Even so, girls are careful about what they wear so as not to look overweight.
2. According to the results of our study, girls are more concerned than boys that they do not have a sufficiently toned body and that they do not look as good as they would like to.
3. In principle the interviewed subjects approve of/like their own body.
4. According to our study, girls are much more concerned with changing something in their own body than boys.
5. Both girls and boys, in a quite large number, compare their body with that of others.

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THE EFFECT OF ACUTE MODERATE HYPOXIA AND ACUTE OZONE EXPOSURE ON EXERCISE PERFORMANCE IN RATS

UGRON ÁGNES¹, TACHE SIMONA², MOLDOVAN REMUS²

ABSTRACT. *Aims:* We investigated the effect of acute moderate hypoxia exposure and the effect of acute ozone exposure on exercise in normobaric normoxia. *Material and methods:* The research was performed in 4 groups of white male Wistar rats (n = 10 animals /group) with a weight of 280-300 g: Group I – control, normoxic exercise; Group II - exposed to acute O₃ and normoxic exercise; Group III – exposed to acute moderate hypoxia (corresponding to a 2500 m altitude) and normoxic exercise; Group IV – combination of O₃ and moderate hypoxia and normoxic exercise. The exposure to moderate hypoxia was for 3 days, 20 hours/day at values of 2500 m using hypoxic rooms. The rats were exposed to ozone for 3 days, 5 min/day. The groups were trained in normoxia daily. The exercise capacity was measured during the swim test on days 1, 2, 3 (T₁, T₂ and T₃). *Results:* In all groups, significant increases in maximal exercise capacity occur during the course of the 3 days, compared to initial values (T₁). In group II, exposed to O₃ before exercise, decreases in maximal exercise capacity are found, which are significant in T₃ compared to groups I, III and IV. In group III, exposed to hypoxic stress before exercise, significant increases in maximal exercise capacity are found at all moments, compared to groups I and II. In group IV, exposed to combined stress before exercise: O₃, hypobaric hypoxia – significant increases in maximal exercise capacity are found at all moments, compared to groups I, II and III. *Conclusions:* Acute moderate hypoxia limits maximal exercise capacity in rats under normobaric normoxia conditions. Acute O₃ exposure determines a significant increase in maximal exercise capacity in rats under normobaric normoxia conditions. The association of acute O₃ exposure and acute moderate hypoxia exposure determines a significant increase in maximal exercise capacity in rats. The use of acute O₃ exposure is recommended for increasing exercise capacity under normobaric normoxia conditions.

Keywords: *acute exposure, hypobaric hypoxia, ozone, effort.*

REZUMAT. **Efectele hipoxiei acute moderate și expunerii acute la ozon în performanțele de efort la șobolani.** *Obiective:* S-au investigat efectele expunerii acute la hipoxie hipobară și efectul expunerii acute la ozon asupra performanțelor de efort în normoxie normobară. *Materiale și metode:* Cercetările au fost efectuate pe 4 loturi de șobolani albi masculi rasa Wistar (n = 10 animal/ lot), cu greutate de 280-300 g: Lotul I. – control, efort fizic în condiții de normoxie; Lotul II. - expuse la hipoxie moderată acută (corespunzător altitudinii 2500 m) și la efort în normoxie; Lotul III. - expuse la O₃ acut și la efort în normoxie; Lotul IV. – combinație între O₃, hipoxie moderată acută și efort în normoxie; Expunerea simulată s-a făcut la camera

hipobarică timp de 3 zile, 20 de ore pe zi la 2500 m. Expunerea la ozon s-a făcut timp de 3 zile, zilnic 5 min. Loturile au fost antrenate zilnic în normoxie. Pentru capacitatea maximă aerobă de efort s-a aplicat testul de înot, momentele investigate fiind T_1, T_2 și T_3 . *Rezultate:* La toate loturile au loc creșteri semnificative ale capacității maxime de efort pe parcursul celor 3 zile, față de valorile inițiale (T_1). La lotul II, expus preefort stresului hipoxic, se constată scăderi ale capacității maxime de efort, care sunt semnificative în T_3 comparativ cu lotul I, III. și IV. La lotul III, expus preefort la O_3 , se constată creșteri semnificative ale capacității maxime de efort în toate momentele, comparativ cu lotul I. și II. La lotul IV, expus preefort stresului combinat: O_3 , hipoxie hipobară, se constată creșteri semnificative ale capacității maxime de efort în toate momentele, comparativ cu lotul I., II și III. *Concluzii:* Hipoxia acută moderată limitează capacitatea maximă de efort la șobolani în condiții de normoxie normobară. Expunerea acută la O_3 determină o creștere semnificativă ale capacității maxime de efort la șobolani în condiții de normoxie normobară. Asociația expunerii acute la O_3 și la hipoxia acută moderată determină o creștere semnificativă ale capacității maxime de efort la șobolani. Este recomandată folosirea expunerii acute la O_3 pentru creșterea capacității de efort, în condiții de normoxie normobară.

Cuvinte cheie: expunere acută, hipoxia hipobară, ozon, efort.

Background

The Olympic Games in Ciudad de Mexico (1968), which took place at a medium altitude (2241 m), have refocused interest in physical exercise at altitude, brought to attention as early as 1896 by Paul Bert.

The studies that followed confirmed the favorable effects of training at a medium altitude on athletic performance at sea level, in predominantly aerobic endurance sports (running over 800 m, road cycling, rowing, kayaking-canoeing, swimming, judo, wrestling, boxing, long-distance skiing, etc.) and in predominantly anaerobic sports (sprinting, jumping, throwing, weightlifting, alpine skiing, gymnastics, fencing) (Drăgan, 2002).

The adaptive functional changes at a medium altitude between 1800-2800 m can improve athletic performance, by increasing exercise capacity and athletic efficiency.

Altitude represents complex environmental stress through hypobaric hypoxia (O_2 concentration at 2000 m is 15.8%, compared to the value at sea level, 20.94%); air temperature and humidity; ultraviolet (UV) radiation (intensity varies between 27% for UVA and 35% for UVB at 2000 m) and the interaction with the ozone layer that retains UV rays (only 1% of UVA radiation reaches the soil), as well as individual characteristics (Tache, 2000; Drust, 2010; Levett, 2010).

Many researches, particularly in human subjects, have monitored the effects of the exposure of the body to various altitudes by: real or simulated exposure in barochambers; intermittent exposure; progressive exposure; the "live high – train

low” and ”live low – train high” models associated with exercise; long duration, less acute exposure; as well as postexposure effects (Bailey, 1997; Demo, 2007; Martoma, 2007; Bonetti, 2009; Beidleman, 2009; Millet, 2010; Levett, 2010; Wang, 2010; Vogt, 2010 Debevec, 2010; Tonini, 2011; Vogitzis, 2011; Siebenmann, 2011).

Aims

We investigated the effect of acute moderate hypoxia exposure and the effect of acute ozone exposure on exercise in normobaric normoxia.

Material and methods

The research was performed in 4 groups of white male Wistar rats (n = 10 animals /group) with a weight of 280-300 g, from the Biobase of the ”Iuliu Hațieganu” University of Medicine and Pharmacy Cluj-Napoca, which were maintained under adequate vivarium conditions at the Biobase of the Department of Physiology:

- Group I – control, normoxic exercise;
- Group II - exposed to acute O₃ and normoxic exercise;
- Group III – exposed to acute moderate hypoxia (corresponding to a 2500 m altitude) and normoxic exercise;
- Group IV – combination of O₃ and moderate hypoxia and normoxic exercise.

The exposure to moderate hypoxia was for 3 days, 20 hours/day at values of 2500 m, pO₂ – 117 mmHg, using hypoxic rooms from the Experimental Laboratory of the Department of Physiology.

The rats were exposed to ozone for 3 days, 5 min/day at values of 0.5 ppm, according to EU norms, using an AIR O₃NE Labor apparatus (SC Triox SRL).

The groups were trained in normoxia daily, and maximal aerobic capacity (values in sec.) was assessed after exposure to hypoxia or O₃.

The exercise capacity was measured during the swim test on days 1, 2, 3 (T₁, T₂ and T₃).

Statistical analysis was performed using SPSS 19.0 and Microsoft Excel. The level of statistical significance was set at p < 0.05.

Results

a) The descriptive statistical analysis for maximal exercise capacity in the studied groups is shown in Table 1.

Table no. 1.

Statistical centrality indicators for the swimming time (sec.)
by moments in groups I-IV.

Group	T1			T2			T3		
	Mean	Standard deviation	Standard Error	Mean	Standard deviation	Standard Error	Mean	Standard deviation	Standard Error
Group I	538.7	42.074	13.305	605.3	21.965	63.825	699.5	36.867	11.658
Group II	504.1	73.286	23.175	570.9	6.946	20.183	623	51.962	16.432
Group III	587.9	52.784	16.692	672.8	38.113	12.052	740.6	46.498	14.704
Group IV	608.9	51.041	16.141	755.9	84.286	26.652	819	94.772	29.970

b) The comparative statistical analysis for maximal exercise capacity between the groups and in each group at the studied moments is shown in Tables II and III and Figure 1.

Table no. 2.

Comparison of the swimming time between groups I-IV
for moments T₁, T₂ and T₃

Groups		Moments and p values		
Group A	Group B	T1	T2	T3
Group I	Group II	0.212	0.124	0.001
Group I	Group III	0.033	0.000	0.042
Group I	Group IV	0.004	0.000	0.002
Group II	Group III	.009	.000	.000
Group II	Group IV	.002	.000	.000
Group III	Group IV	.378	.011	.030.

Table no. 3.

Comparison of the swimming time between moments and
p values in groups I-IV.

Group	T1-T2	T1-T3	T2-T3
Group I.	0.575	0.117	0.717
Group II.	0.055	0.001	0.016
Group III.	0.001	0.209	0.025
Group IV.	0.528	0.517	0.000

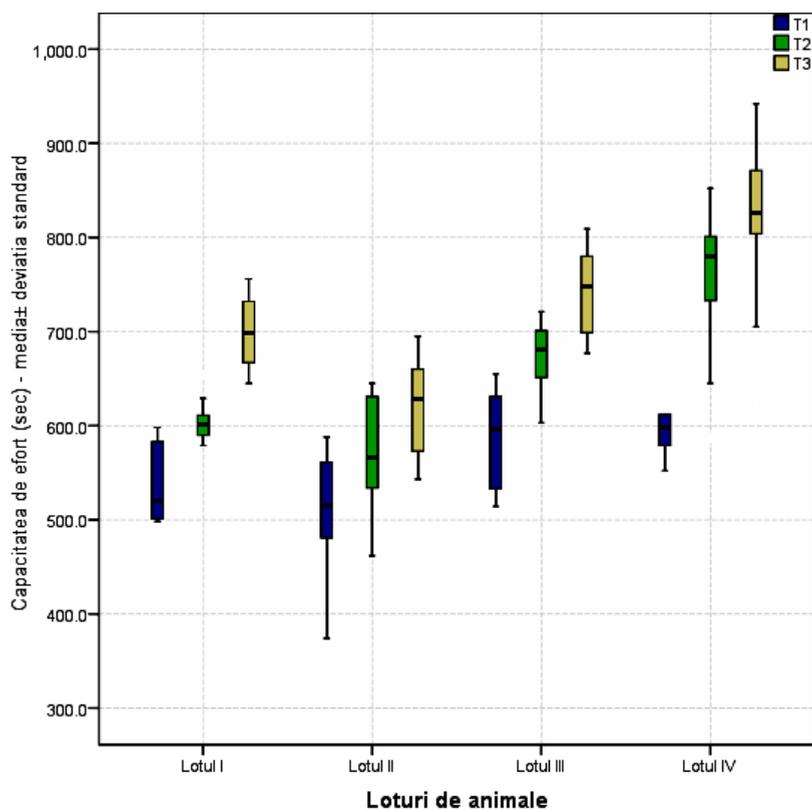


Fig.1 - Comparison of the swimming time between groups I-IV by moments.

Discussion

Physical exercise performed under normobaric normoxia conditions (363 m; O_2 concentration = 20.94% and air $pO_2 = 117$ mmHg) determines an increase in maximal exercise capacity.

In all groups, significant increases in maximal exercise capacity occur during the course of the 3 days, compared to initial values (T_1).

In group II, exposed to O_3 before exercise, decreases in maximal exercise capacity are found, which are significant in T_3 compared to groups I, III and IV.

In group III, exposed to hypoxic stress before exercise, significant increases in maximal exercise capacity are found at all moments, compared to groups I and II.

In group IV, exposed to combined stress before exercise: O_3 , hypobaric hypoxia – significant increases in maximal exercise capacity are found at all moments, compared to groups I, II and III.

Our experimental results show the insignificant, reduced effect of acute hypobaric hypoxia on the maximal exercise capacity of animals under normoxia conditions, compared to exercise unpreceded by hypoxia. These data are in accordance with the observations of other authors regarding the absence of changes in human performance after acute exposure to moderate altitudes (Demo,2007; Clark,2007; Racinalis, 2010; Ponsot, 2010; Vogiatzis, 2011) and in contradiction with previous researches of Dorofteiu et al. (1987) cited by Tache (2000).

The limiting effect of acute hypobaric hypoxia on maximal exercise capacity could be explained by:

- passive exposure to hypoxia (sedentary activity) (Flueck, 2009);
- the absence of adaptive mechanisms due to acute exposure and to the lack of acclimatization (Demo, 2007);
- biochemical oxidative stress determined by exposure to hypoxia, the transition to normoxia (which would be equivalent to hyperoxia), as well as the performance of aerobic exercise and the diminution of antioxidant defense mechanisms (Tache, 2000).

Our results show the significant favorable effect of acute exposure to O₃ on maximal exercise capacity, which could be due to:

- the improvement of tissue oxygenation and blood circulation;
- the modulating action on the pro- and antioxidant systems of the body (Țăran, 2010).

Hypoxic O₃ preconditioning has the most significant effects on the increase in maximal exercise capacity, which can be due to the protective effects of O₃ on skeletal muscle during exercise and exercise-induced oxidative stress via glutathione, heme-oxygenase-1 (HO-1) and metallothionein, which mediate antioxidative capacity (Saxena).

Conclusions

1. Acute moderate hypoxia limits maximal exercise capacity in rats under normobaric normoxia conditions.
2. Acute O₃ exposure determines a significant increase in maximal exercise capacity in rats under normobaric normoxia conditions.
3. The association of acute O₃ exposure and acute moderate hypoxia exposure determines a significant increase in maximal exercise capacity in rats.
4. The use of acute O₃ exposure is recommended for increasing exercise capacity under normobaric normoxia conditions.

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THE ASSESSEMENT OF MUSCULAR STRENGTH WITH ISOKINETIC DYNAMOMETER EMPHASIZING THE GENDER DIFFERENCES

BULDUȘ CODRUȚA¹, FEKETE ARANKA

ABSTRACT. The muscular strength is a fundamental property of human performance. Because of that, a large amount of empirical and scientific literature is devoted to its development and evaluation. Strength testing provides important information regarding human performance, by evaluating the effects of training, muscular fatigue, injury rehabilitation, muscular balance, or the functional abilities of different individuals. The purpose of the research is to establish the importance of evaluations, strength-test protocols and its variables, for a good understanding of the muscular strength gender differences and development of new methods of strength assessment. The study was made on 10 students from the Faculty of Physical Education and Sport, Cluj-Napoca, by assessing the strength of quadriceps muscle in isometric and isokinetic (eccentric and concentric) mode with a Kin-Com AP isokinetic dynamometer. The assessment included peak torque, average force, angle of peak torque, time to peak torque and the highest value of peak torque in both assessing modes: isometric and isokinetic.

Keywords: *muscular strength, evaluation, isokinetic dynamometer, quadriceps muscle, isometric contractions.*

REZUMAT. Evaluarea forței musculare prin dinamometrie izokinetică cu evidențierea diferențelor de gen. Forța musculară este o proprietate fundamentală a performanței umane și apare pe o scară largă în literatura științifică. În evaluarea efectelor antrenamentului, oboselii musculare, balanței musculare, sau capacităților funcționale individuale, testarea forței furnizează informații importante referitor la performanța umană. Studiul își propune să stabilească importanța evaluării și protocoalelor de evaluare a forței, precum și a variabilelor sale, pentru a înțelege diferențele musculare între sexe și a dezvolta noi metode de cunoaștere, dezvoltare a aparatului locomotor. În studiu, a fost investigat un lot de 10 studenți la Facultatea de Educație Fizică și Sport, Universitatea Babeș-Bolyai, Cluj-Napoca, prin evaluarea forței cvadricipitale în modul izotonic și izokinetic a dinamometrului izokinetic Kin-Com. Se pot observa valorile maxime și minime ale forței maxime, forței medii, setul în care s-a declanșat acesată forță, timpul necesar atingerii acestor valori în ambele moduri de evaluare (izometrică și izokinetică). În cadrul evaluării se evidențiază diferențele de valori între contracțiile izokineticice concentrice și excentrice precum și a celor obținute în contracțiile izometrice.

Cuvinte cheie: *forța musculară, evaluare, dinamometru izokinetic, modul izometric, modul izokinetic.*

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Introduction

Strength testing provides important information regarding human performance in evaluating the effects of training, muscular fatigue, injury rehabilitation, muscular balance, or the functional abilities of different individuals.(Maud, P.J. & Foster, C.,1995).

The most common tools for assessing strength are free weights-dumbbells, barbells and other related types of equipment. In strength test using free weights, the velocity of movement is typically not controlled but could be determinate via laboratory methods (eg., video analysis).

Isokinetic dynamometry is an other, more elaborated method of assessing muscular strength. The dynamometer is capable of providing objective and quantifiable strength data in static (isometric) situations, and it also has the advantage of providing similar information for dynamic muscle contraction. The testing performed with a dynamometer that maintains the lever arm at a constant angular velocity is called "isokinetic" (Wimpenny P., 2000).

The Kin-Com is a typical example of an isokinetic dynamometer that is capable of testing and exercising muscles in a wide range of exercise modes: passive, isometric, isotonic and isokinetic (Tidswell, M., 1998).

The order of strength describes how much torque (strength) we can produce in the various exercises or tests if the test is the same. The order of strength described by Davies, 1984:

HIGHEST-Isokinetic eccentric>isotonic eccentric> isometric> isokinetic concentric> isotonic concentric-LOWEST.

Aims

The purpose of the research is to highlight through the isometric and isokinetic testing method the gender differences in muscular strength and to establish the importance of, evaluations, strength-test protocols and its variables, for a good understanding and development of new methods of strength assessments.

Methods

The study was made on 10 students from the Faculty of Physical Education and Sport, Cluj-Napoca, by assessing the quadriceps muscle strength of the left lower limb in isometric and isokinetic (eccentric and concentric) mode with a Kin-Com AP isokinetic dynamometer, in the Research Center of the Faculty of Physical Education and Sport.

The testing was made from the sitting position, the aim is to evaluate the left lower limb, more exactly the quadriceps muscle strength, and indirectly the articulation of the knee. We assessed the quadriceps muscle force in two modes: isometric and

isokinetic. In the isometric contraction the force is evaluated at 3 angles, each subject: 30°(40°), 60° and 90°. The anatomical 0 point is considered in the complete extension of the knee. At each point the contraction is maintained 5 seconds (the countdown appears on the screen as a visual feedback).

The isokinetic mode assessment is made in two ways: concentric and eccentric, so at a 30°/second velocity the force in the concentric and eccentric contractions are measured on a 50° distance, from 40° to 90°(0° point is at the complete extension of the knee).

The protocol used in the research; isokinetic lower limb evaluation is a modified version of the evaluation methodology described by Jones(1996):

1. Assess the patient by both subjective and objective examination.
2. Familiarize the patient with the isokinetic dynamometer.
3. Explain the test aims.
4. Ensure that the patient warms up without the dynamometer, e.g. stretches, cycle ergometer.
5. Position and stabilize the patient accurately on the dynamometer.
6. Allign the joint and dynamometer axes of rotation as closely as possible.
7. Use gravity correction if testing is a gravity-dependent position.
8. Select the test type, e.g. isometric for knee extensors.
9. Warm up on the dynamometer using the "warm up" mode.
10. Perform the maximal test at the chosen velocity, e.g., perform three isometric repetitions, with a 30-second rest between repetition and 1 minute between sets.
11. Select the test type, e.g. concentric/eccentric for knee extensors.
12. Select the test velocity, e.g. 30°/second.
13. Perform the maximal test at the chosen velocity, e.g., perform three concentric/eccentric repetitions with overlay facility, with a 30- second rest between repetition and 1-minute between sets.
14. Record the test details.

Results

In the chart below is shown the gender distribution and the level of practicing physical activities. There is a prevalence of the female and 21 years old subjects, the majority do not practice any sport at a high performance. Two subjects of tree, that practice some kind of sport at proficiency level, are male.

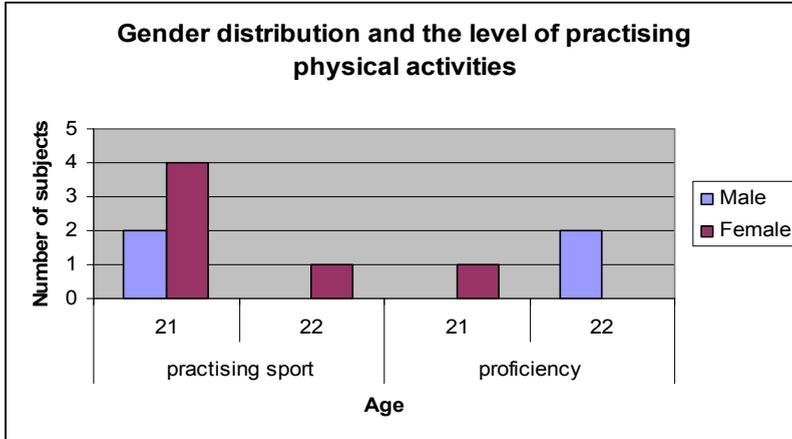


Fig.no.1. Bar chart of gender distribution of the subjects and the performance level of practicing sports

In figure no.2 are shown the highest values of peak force and the angle of these forces in isometric contractions. There can be observed, that the maximal values of peak force in isometric contractions are reached with a half percentage at 90° and 60°. Despite this, the maximal value of peak force can be observed at 60°, as at the male subjects so at the female subjects too. The gender difference between the peak forces is obvious, the maximal value of peak force between the male subjects it's at least double comparing with female subjects.

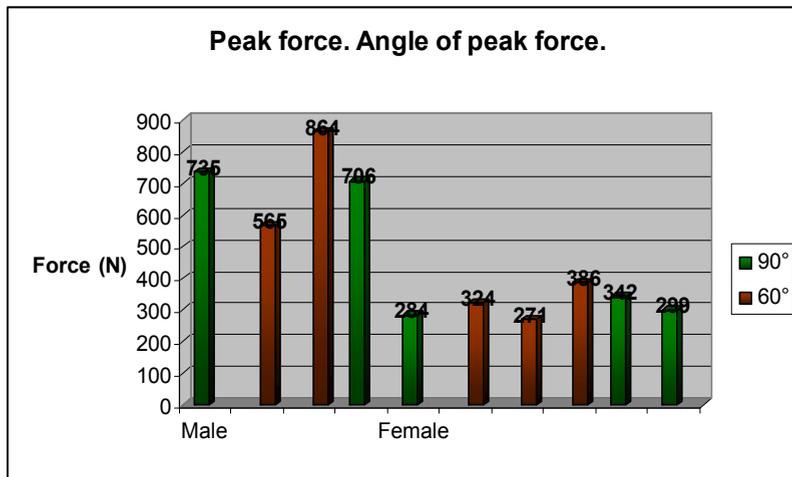


Fig.no.2. Bar chart of highest values of peak force and the angle of these forces in isometric contractions

As we can see in the fig.no.3. the maximal values of the peak force are reached by the majority of the subjects in the first set, then in the third and at last in the second set. This peak force is reached at the majority of female subjects at the first half time of the contraction and at the majority of male subjects in the second half.

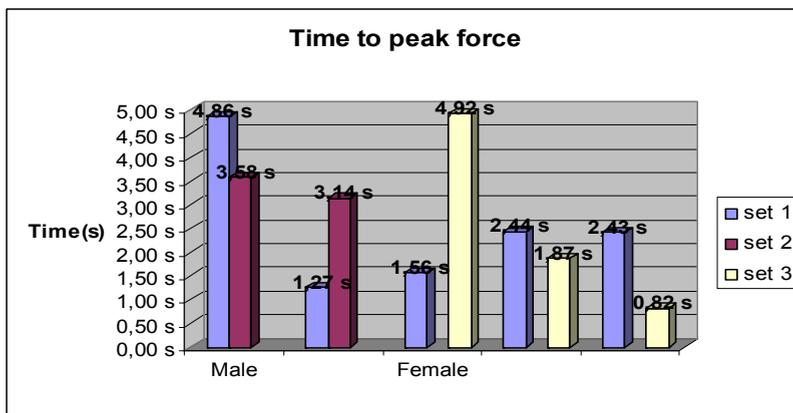


Fig.no.3. Bar chart of gender and set number distribution of the values of time to peak force in isometric muscle contractions

As we can see in the fig.no.4. the minimal values of peak force are reached at 30 and 40 degrees, in angles that are close to the horizontal position (anatomical 0 point).

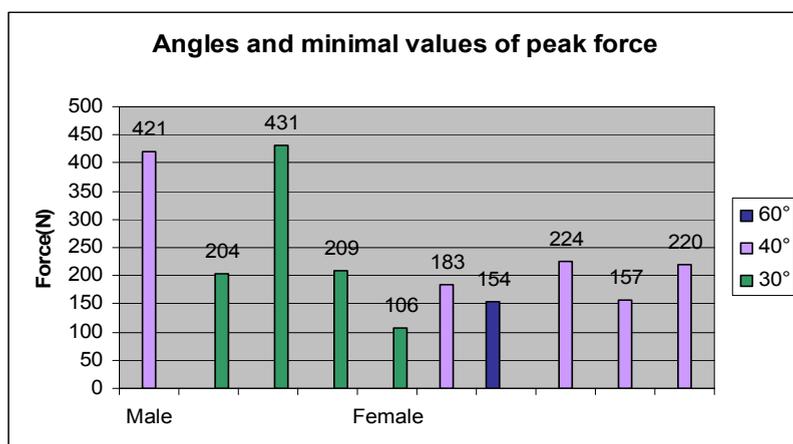


Fig.no.4. Bar chart of minimal values of peak force and the angle of this force in isometric contractions

The differences between maximal and minimal values of peak force at male subjects are about 300-400 N, almost triple comparing with female subjects; this difference is constant, in every case particularly at male and female subjects.

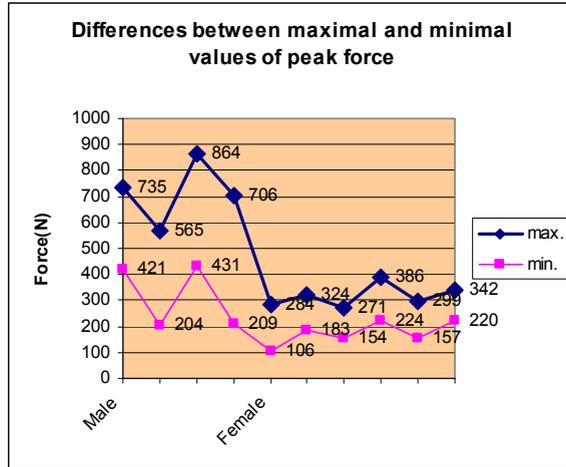


Fig.no.5. Line chart of maximal and minimal values of peak force in isometric contractions

We can see in the fig.no.6., that at majority of the cases the eccentric isokinetic force is higher than concentric force, excepting 2, 3 subjects, where these two values are very closed, and in a single case these values are inverted.

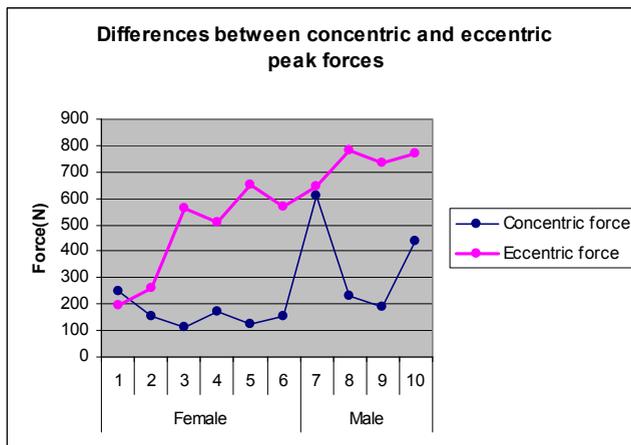


Fig.no.6. Line chart of maximal peak force values in isokinetic concentric and eccentric contractions

In average there can be observed in the fig.no.7. the order of the muscular peak force: isokinetic eccentric > isometric > isokinetic concentric.

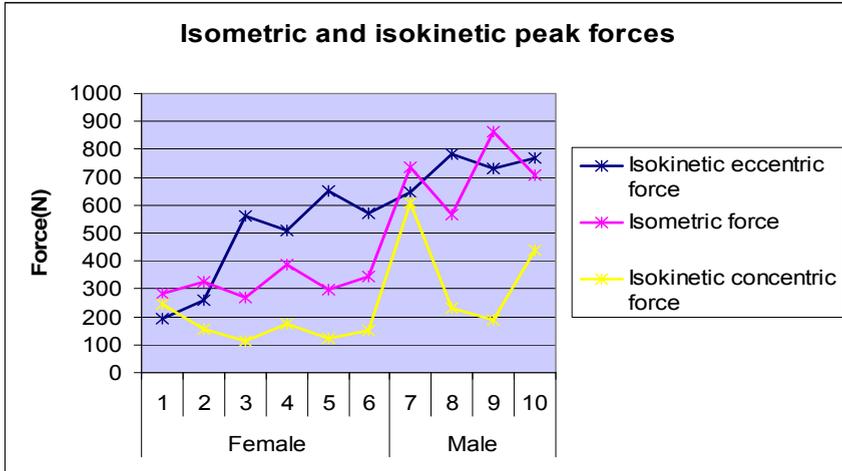


Fig.no.7. Line chart of maximal peak force values in isometric and isokinetic contractions

In eccentric contractions peak forces are reached in the first 20° (from the 0 position), and in concentric contractions at the last 30°(30° interval before the final position).

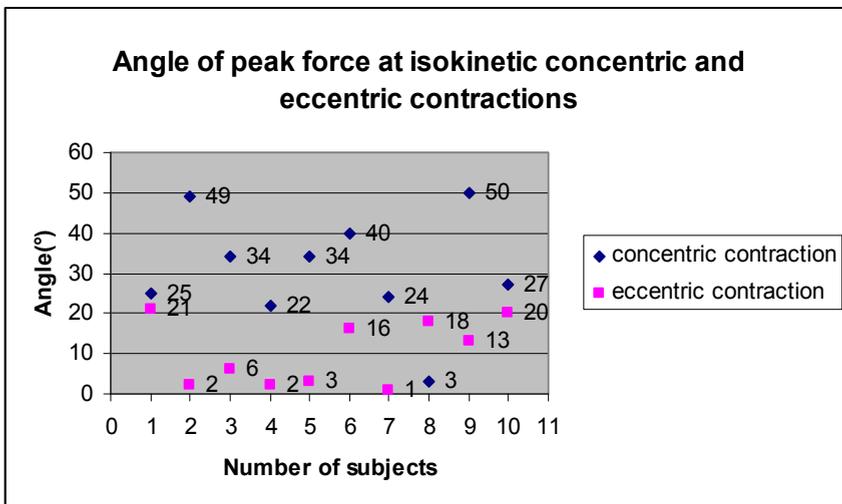


Fig.no.8. Scatter chart of the angles of the maximal peak force values at isokinetic concentric and eccentric contractions

Discussions and conclusions

In our research the maximal values of the peak force in isometric quadriceps muscle contractions are reached at 50 % of the subjects at 90° and the other 50% at 60°, although the average force is higher at 60° than at 90°. So we can say that at 60° of knee flexion, the effectiveness of the quadriceps is maximum because the force developed by the muscle and the moment of the extensor mechanism are both relatively large, and their product is optimal; at the other side at 90° of knee flexion once quadriceps moment decreases, the force developed by the muscle increase. This is described more widely by Shelburne, and Pandey, 1997.

Time to peak force is a variable that can reflect the predominance of the muscle fibre types; in the fig.no.3 we can observe that the peak force is reached by the majority of female subjects in the first half time of the contraction, this reflects that they have a predominance of muscle fiber type II; and at the majority of male subjects predominates muscle fiber type I, because they reach the peak force at the second half time of the muscle contraction. The gender differences in muscle fiber types are more elaborated in the article of Miller A. E. J. et.al, 1992.

The minimal values of peak force in isometric contraction can be observed at the angles close to the horizontal position, indeed quadriceps force is minimum when the knee is fully extended because the muscle fibres are too short to develop much force in this position.

An interesting phenomenon is that the difference between minimal and maximal values of peak force is relative constant; at male subjects is approximately 300-400 N and at female subjects about 100-200 N, in this way the value of the peak force is equally proportioned with the interval between the two peak forces (maximal and minimal).

In the fig.no.6. and fig. No.7. we can observe the order of strength described before by many scientists (Davies, 1984), so in eccentric actions the muscle result higher strength value than in concentric and isometric actions. (isokinetic eccentric > isometric > isokinetic concentric).

In our study we highlighted that isokinetic testing is a very usefully tool in the assessment of gender differences in muscular strength, and we also emphasized the particularities of muscle strength through different modalities of assessment and it's variables.

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PHYSICS AND BIOMECHANICS-ELEMENTS OF ANALYSIS IN JUDO

POP IOAN-NELU¹, SALINCEAN VASILE

ABSTRACT. The paper “**PHYSICS AND BIOMECHANICS ELEMENTS OF ANALYSIS IN JUDO**” tries to give a scientific substantiation to JUDO techniques with the aid of a physical and biomechanical approach. By emphasizing the connection between physics and biomechanics the paper describes the reason for which some JUDO phenomena occur, not the way they are supposed to be done. In this paper, we try to replace the notion “how is it done” with “why is it done”. With the aid of the themes presented, we try to illustrate and explain some notions from physics and biomechanics such as: scalars and vectors, centre of gravity of a rigid body, equilibrium of a body lying in the horizontal plane, and some simple mechanisms from physics and biomechanics applied in JUDO. The main idea that derives from the paper “**PHYSICS AND BIOMECHANICS ELEMENTS OF ANALYSIS IN JUDO**” is that the basis of any NAGA – WAZE technique is represented by the following two simple mechanisms THE BONE LEVER and THE FORCE COUPLE.

Keywords: *biomechanics; judo; NAGA – WAZE; bone lever; force couple; techniques*

REZUMAT. Fizica și biomecanica, elemente de analiză în judo. Lucrarea „**FIZICA ȘI BIOMECANICA ELEMENTE DE ANALIZĂ ÎN JUDO**” încearcă să pună fundamentele științifice ale procedeele de JUDO printr-o abordare a fizicii și biomecanicii. Prin explicarea legăturii dintre fizică și biomecanică lucrarea de față dorește să explice motivul pentru care anumite fenomene din JUDO au loc și nu modul în care se execută. În lucrare încercăm să înlocuim în JUDO argumentarea de genul „CUM SE FACE” cu argumentarea „DE CE SE FACE”. Prin tematicile abordate în lucrare, venim și explicăm noțiuni din FIZICĂ și BIOMECANICĂ, cum ar fi: mărimi scalare și vectoriale, centru de greutate al unui corp rigid, echilibrul unui corp sprijinit pe plan orizontal, mecanisme simple din FIZICĂ și BIOMECANICĂ aplicate în JUDO. Ideea principală care se desprinde din lucrarea „**FIZICA ȘI BIOMECANICA ELEMENTE DE ANALIZĂ ÎN JUDO**” este că la baza tuturor procedeele de NAGE – WAZA stau cele două biomecanisme simple PÂRGHIA OSOASĂ și CUPLU DE FORȚE.

Cuvinte cheie: *bimecanică; judo; NAGA – WAZE; pârghia osoasă; cuplu de forțe*

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INTRODUCTION

1.1 The importance and the present interest of the theme

In order to understand the multitude of phenomena which arise when attempting a JUDO technique, in both the up and the ground execution, we appealed to the basics from Physics and Biomechanics as sciences which are involved in the performance of judo techniques.

PHYSICS: is the intellectual path which, releasing the phenomena of deceiving appearances of movements and forces, allows the man to achieve a conceptual map of nature, with the aid of which he tries to explain himself the mystery of the surrounding relationship which he is part of.

BIOMECHANICS: is the science which studies the movement of the living beings, especially the human ones, according to their mechanical features.

THE BIOMECHANICS OF PHYSICAL EXERCISES: is the part of BIOMECHANICS which deals with the study of the positions and movements which are specific to sport activity, using the principles and the laws of applied mechanics for the specifics of the sport effort.

1.2 JUDO problems solved with the aid of PHYSICS and BIOMECHANICS

1. To appreciate the effectiveness of the physical exercises used in JUDO
2. To study the technique used in the initiation process in JUDO, emphasizing what is physically and biomechanically essential in learning and applying a JUDO technique;
3. To appreciate the performing quality of a JUDO technique by eliminating the mistakes, according to a scientific approach
4. To improve the technique of JUDO using an accurate execution with a right biomechanics and to give it a scientific substantiation
5. To study the functional indices of the JUDOKA's development in order to establish the ways of developing and improving the technique execution

1.3 The importance of the theme

- a. The scientific substantiation of the execution of JUDO techniques
- b. The comprehension of the professors, coaches and sportsmen of the mechanisms underlying a JUDO technique;
- c. The lack of approach to this theme national wide;
- d. Documentary basis for other subjects;

For a proper grasp of the theme "The substantiation of biomechanics in JUDO throwing techniques" we consider that it is necessary to expand the notion of the physical exercises' biomechanics.

Biomechanics is the science which studies the movement of the living beings, especially the human ones, according to their mechanical features. Biomechanics can be regarded as the mechanics applied to the statics and dynamics of human beings.

The biomechanics of physical exercises is the part of BIOMECHANICS which deals with the study of the positions and movements which are specific to sport activity, using the principles and the laws of applied mechanics for the specifics of the sport effort.

Biomechanics consists of:

- a) General biomechanics – studies the general objective laws of movements
- b) Special biomechanics – studies the singularities of movements in different disciplines, judo in our case;

The biomechanics of physical exercises enables us to solve the following problems in JUDO:

1. To appreciate the effectiveness of physical exercises involved in judo in order to solve the required tasks.
2. To study the technique used in the initiating judo process, emphasizing the essential, in order to achieve a valuable result.
3. To appreciate the quality of judo technique exercises and to spot the mistakes, their causes and consequences.
4. To improve the judo technique using an accurate execution with a right biomechanics and to give it a scientific substantiation
5. To study the functional indices of the JUDOKA's development in order to establish the ways of developing and improving the technique execution.
- 6.

1.4 The importance of the theme

- a) The scientific substantiation of the execution of JUDO techniques
- b) The professors, coaches and sportsmen comprehension of the mechanisms underlying a JUDO technique;
- c) The lack of approach of this theme national wide;
- d) Documentary basis for other subjects;

PHYSICAL CONCEPTS APPLIED IN JUDO

1.1.2 Physics: is the science that deals with the study of matter, elementary particles, atomic nuclei, atoms and molecules, the units made up of atoms and molecules such as solids, liquids or gases, and some forms of motion of the matter: mechanical, thermal and electromagnetic motion.

1.1.3 Physical quantities:

In order to be able to characterize the physical phenomena, physicians introduced the physical quantities. For the motion phenomenon there were introduced: space, time, acceleration and trajectory.

The notions: space, time, velocity, mass, temperature, etc. are called **physical quantities**.

1.2 Scalar and vector quantities

1.2.1 Scalars: are those physical quantities which we can be fully characterized only by specifying their value.

Examples: mass, energy, density and temperature are scalar quantities

1.2.3 Vector representation:

- Vector notation: denoted by a letter which has an arrow above \vec{a} .
- The magnitude of the vector: represented by the length of the line segment OA.
- The direction of the vector: given by the orientation of the line XX'.
- Sense of the vector: given by the sense of the arrow attached to the line segment OA.

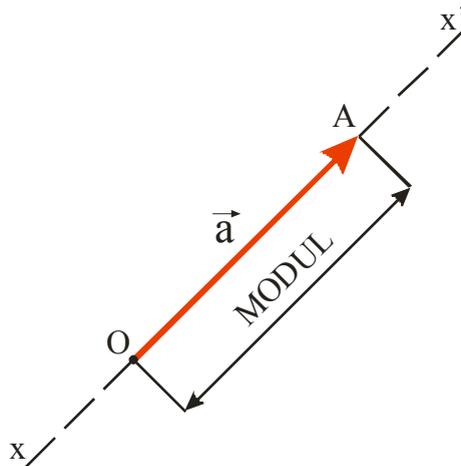


Fig.1

1.3.4 Vector addition. The parallelogram rule

- adding two vectors \vec{a} and \vec{b} means finding the magnitude of the vector $\vec{c} = \vec{a} + \vec{b}$ and the orientation of \vec{c} .

The parallelogram rule

a)

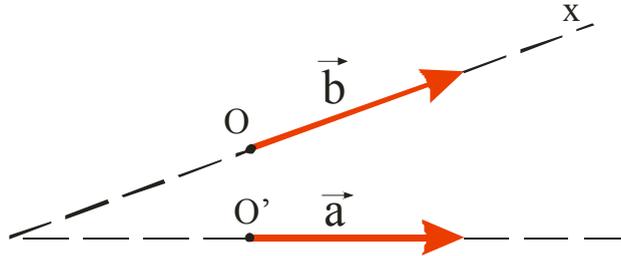


Fig. 10

b)

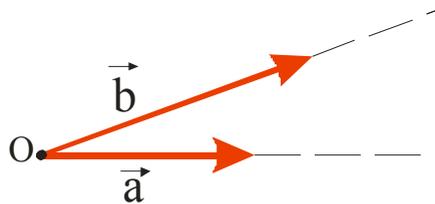


Fig. 11

c)

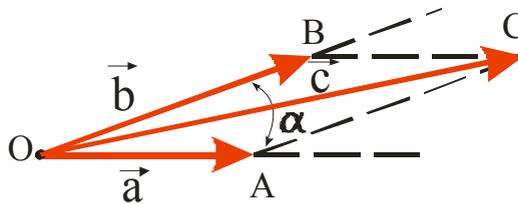


Fig. 12

1.2.0 THE COMPONENT PARTS OF PHYSICS

KINEMATICS: studies the motions of the bodies from a geometrical and abstract point of view without giving credit to the causes (forces) which produce them.

Kinematics is the geometry of motion that combines the idea of space and the idea of time and enables us to study the space properties. Functions of time: $S=f(t)$; S-the space; t=elapsed time.

STATICS: is the part of physics which deals with the study of the systems of equivalent forces and equilibrium conditions.

DYNAMICS: is the part of physics which studies the motion of motor systems taking into account the forces involved.

2.1 Statics of a rigid body

A body is in equilibrium position if the following two conditions are satisfied:

a) The vector sum of all external forces is zero

$$\sum \vec{F}_n = \vec{F}_1 + \vec{F}_2 + \vec{F}_3 + \dots + \vec{F}_n = \vec{0} \quad (1), \vec{F}_n \text{-external forces}$$

b) The vector sum of all torques that act on the rigid body is zero

$$\sum \vec{M}_n = \vec{M}_1 + \vec{M}_2 + \vec{M}_3 + \dots + \vec{M}_n = \vec{0} \quad (2) \vec{M}_n \text{-external torque}$$

(1) Shows that a rigid body must have the translational acceleration equal to zero in order to be in equilibrium position.

(2) Shows that a rigid body must have the angular velocity equal to zero in order to be in equilibrium position.

STABLE EQUILIBRIUM: A body is in stable equilibrium if its potential energy has the lowest value from the all possible values which are immediately adjacent to the equilibrium positions.

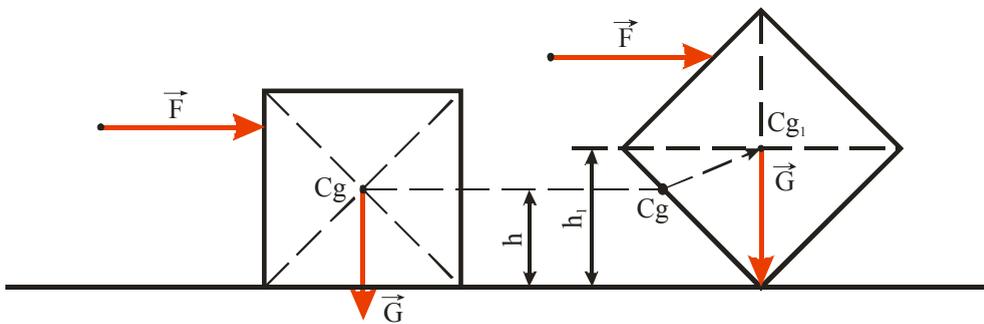


Fig.16

UNSTABLE EQUILIBRIUM: A body is in unstable equilibrium if its potential energy has the maximum value of the all possible values which are immediately adjacent to the equilibrium positions.

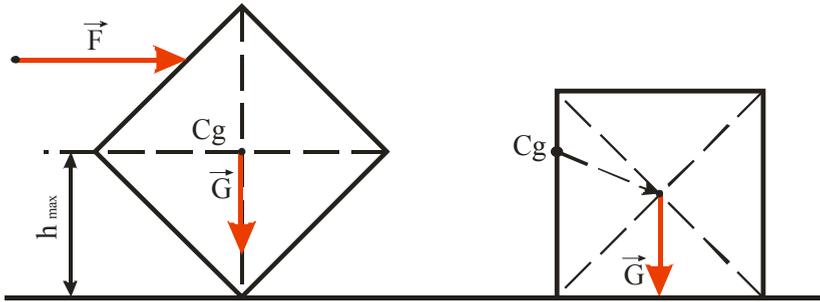


Fig 17

NEUTRAL EQUILIBRIUM:

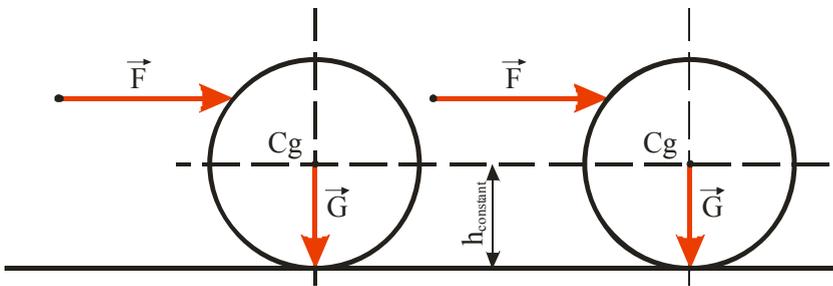


Fig 18

2.4.6 Force couple

The system consisting of two forces which are equal and have opposite directions is called force couple.

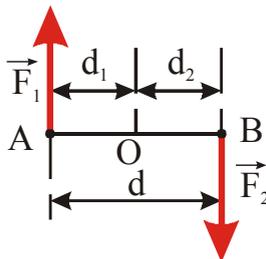


Fig 24

I. 3.0 SIMPLE MECHANISMS FROM PHYSICS APPLIED IN JUDO

Generally, there are two forces which are applied to these simple mechanisms:

- The resistance force which has to be overcome
- The active (motor) force which overcomes the resistance force
- Simple mechanisms: shear, slope, screw, wheel, lever

3.1 The lever:

We call lever any rigid body that is mobile with respect to a fixed axis on which the active forces are trying to rotate it against its resistance force.

In the execution of the judo techniques we will use the operation of the levers applied to the human body. The main purpose of using the lever is to lift a heavy object using a small force.

Components of a lever:

- The force that has to be overcome R-resistance force
- The force with the aid of which the resistance force is overcome, called active force F
- The fulcrum of a lever denoted by s
- d-distance between the active force and the fulcrum s-called the arm of the active force
- d1-distance between the resistance force and the fulcrum s- called the arm of the resistance force

Classification:

- Lever of class I-lever of equilibrium: R.S.F
- Lever of class II- lever of force: S.R.F
- Lever of class III-lever of speed: S.F.R

3.1.1 Lever of class I: R.S.F

- d1- the arm of the resistance force R
- d2- the arm of the active force F
- s-the fulcrum
- F-the active force
- R-the resistance force

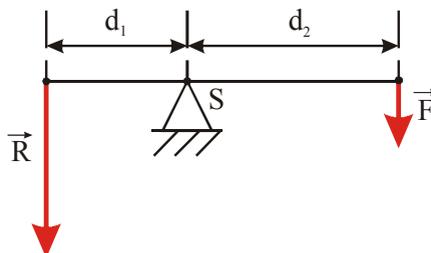


Fig 27

Practical examples from technique: Lifting a weight using a lever of class I

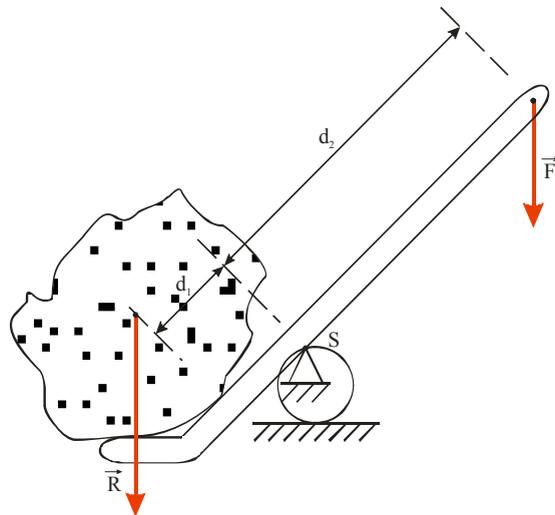


Fig 28

Example from judo: Kata-guruma

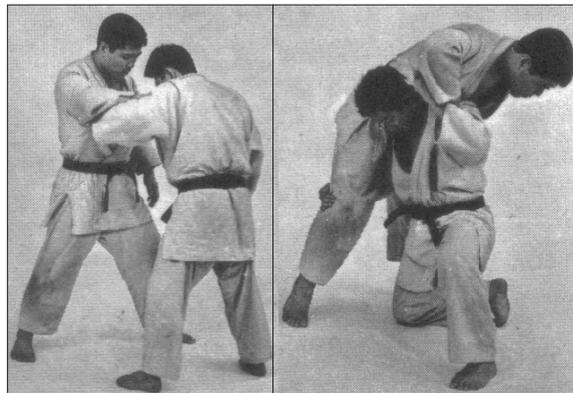


Fig 29

3.1.2 Lever of class II: S.R.F

Characteristics of the lever of class II SRF

- the resistance force is between the fulcrum S and active force F
- d1-the arm of the resistance force
- d2-the arm of the active force

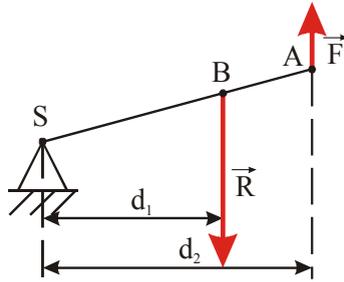


Fig. 30

Example of a lever of class II: the wheelbarrow

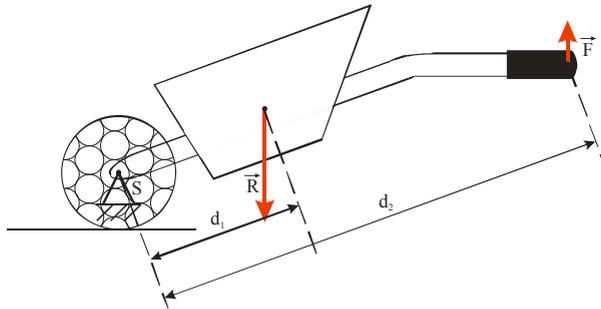


Fig 31

3.1.3 The lever of class III: S.F.R

Characteristics of the lever of class III

- the active force is located between the fulcrum S and the resistance force R: SFR
- d2-distance between the fulcrum S and force F
- d3-distance between the fulcrum S and force R

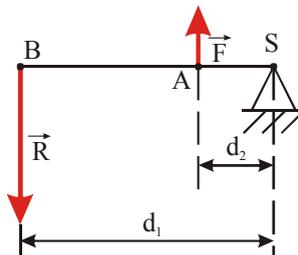


Fig 33

Example of a lever of class III: the elbow joint

- S the elbow joint
- F is the brachial triceps insertion
- R is the weight of the body

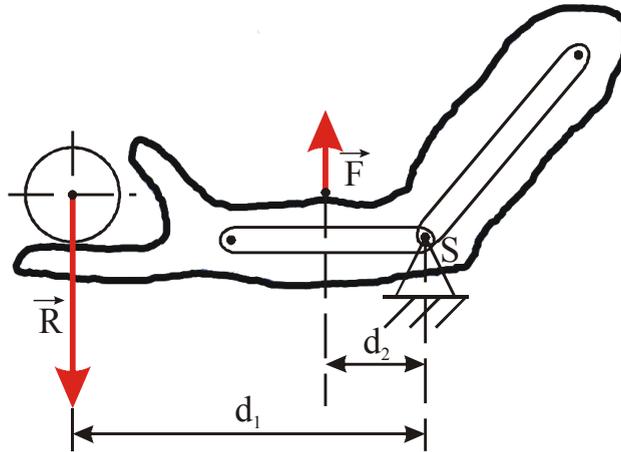


Fig 34

Example of a lever of class III in judo:

The cross arm lock (Ude-Hishigi-Juji-Gatame)



Fig. 35

I. 4.0 DYNAMICS OF THE RIGID BODY

4.1 The law of inertia-first law of dynamics: Law I

The velocity of a body remains constant unless the body is acted upon by an external force

This tendency of the body is called inertia.

A body at rest position tends to stay in the rest position- rest inertia: $v=0$

A body in uniform motions tends to keep on moving -> movement induction

I.5.0 THE ACCELERATION LAW- SECOND LAW OF DYNAMICS

5.1 The acceleration law-the fundamental law of dynamics

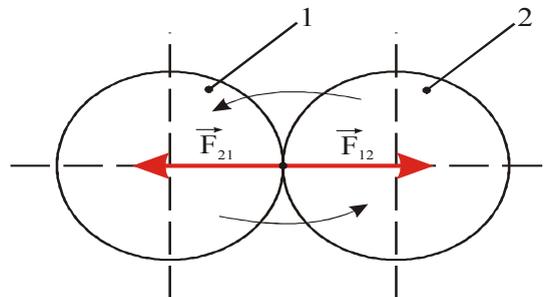
$$F = m \times a; \vec{F} = m \cdot \vec{a}$$

The force which acts on a body is equal to the product between the mass of the body and the acceleration given by the force acting on the body.

When the force acts on a body in the direction and orientation of the movement, there is a variation of the velocity given by the velocity increase -> acceleration

If the force acts on a body in the same orientation but different direction, there is a variation of the velocity given by the velocity decrease-> deceleration

I.6.0 THE LAW OF ACTION-REACTION- THIRD LAW OF DYNAMICS



$$F_{12} = -F_{21}$$

Fig. 40

The Law of Action-Reaction-the force (F_{12}) with which the first body acts on the second body, is equal and in the opposite direction to the force (F_{21}) with which the second body acts on the first one.

1.7.0 PRINCIPLES OF DYNAMICS IN THE ROTATIONAL MOTION

7.1 First principle-the law of inertia

A body is at rest or in rotational motion with a constant angular torque unless a force couple or a torque of an external force acts on it

7.2 Second principle- the law of acceleration

The variation of the angular torque of a body which is rotating around its own axis is proportional to the torque of the force couple or of the external force that acts on it.

7.3 Third principle- The law of action-reaction

If a body during its interaction with another body exerts a torque of a force couple or a torque of a force on the second body, the second one also exerts on the first one a torque which is equal and has opposite direction.

BIOMECHANICS OF THE HUMAN BODY

II.1.0 BIOMECHANICS-is the application of the physics law on the human body

Biomechanics of the sport-studies the complex human movement during the physical exercise and, more specifically, the execution of some JUDO techniques

The biomechanics is the science which analyses the biological and mechanical causes of the movement; when these are known and correctly applied, they lead to the improvement of the JUDO techniques.

Hence, we can distinguish three main seams of research for the biomechanics of sport:

- 1) The evaluation of the motor skills and the physical-biological properties of the athlete
- 2) The rational individualization of the sport technique
- 3) The improvement of the personal technique

1.1 The positions or the postures of the human body

The anatomic position of the human body is the following: in orthostatic position with horizontal look, with adjacent legs, hips and knees in extension, legs at a right angle with respect to the shank, the heels touching, with a **45°** angle between the leg axes. The upper limbs next to the upper parts of the torso, with elbows extended and forearms in supination. The posture is regarded as a neuromuscular response in order to maintain the equilibrium of the body.

JUDO positions are positions derived from the anatomic position of the human body. The stability of a body is given by the power of getting back to the equilibrium position, once it has been unbalanced.

1.2 The vertical position of the human body:

The vertical position is the characteristic of the human body. In orthostatic position, the support basis has the shape of a trapezium comprised in the centre of the two legs. For humans, in bipedal position, the centre of gravity is located at the intersection of the following three planes: frontal plane, sagittal plane and transverse plane at the level of vertebra L2.

1.3 The centre of gravity of the human body

The centre of gravity is located at the intersection of the three main planes, at the level of vertebra L2, in the symmetry plane of the human organism. The vertical axis passing in front of the vertebra L2, posterior to the axofemoral joint, behind the transverse axis of the knee, in front of the taloceleular joint and falls in the middle of the support basis.

The center of gravity doesn't have a fixed position, but varies from man to man, from posture to posture.

1.3.1 The coordinates of the centre of gravity

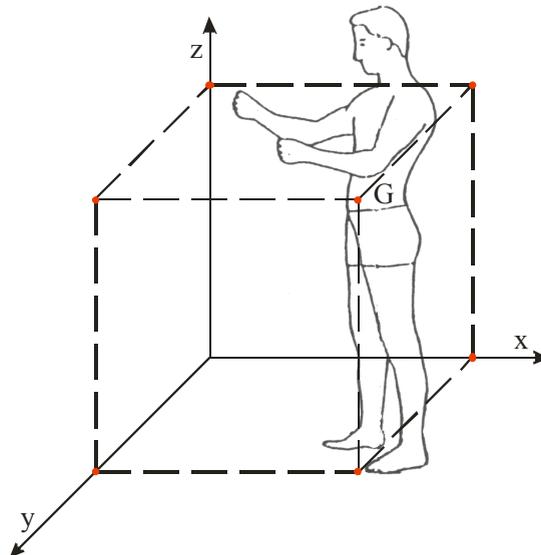


Fig. 41

II.2.3 Equilibrium posture of the human body in JUDO

According to the statics laws, the static equilibrium in JUDO must fulfill the following two conditions:

a) The vector sum of all external forces that act on the JUDOKA's body is zero
 $\Sigma F_n = F_1 + F_2 + F_3 + \dots + F_n = 0$ (1), F_n -external forces

b) The vector sum of all torques that act on the rigid body is zero
 $\Sigma M_n = M_1 + M_2 + M_3 + \dots + M_n = 0$ (2) M_n -external torque

According to the first law of dynamics, a body is at rest position as long as there is no external force to take it out from the rest position.

2.3.1 Stable equilibrium

JUDOKA's body would remain in the equilibrium position as long as the projection of the centre of gravity falls on the centre of the supporting geometrical figure or inside the support area.

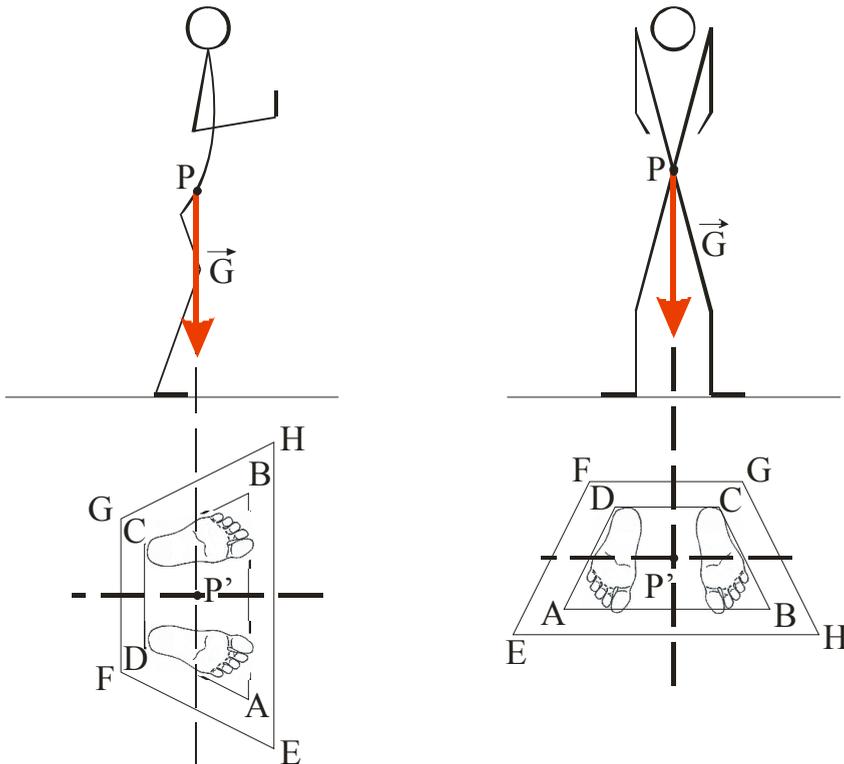


Fig.45

2.3.2 Unstable equilibrium

If above the JUDOKA's body which is in equilibrium position acts an internal force which moves the centre of gravity so that the projection of the centre of gravity falls in the supporting area, which is EFGH-ABCD, we say that we have an auto imbalance.

If above the athlete that is in equilibrium position acts an external force greater than the internal forces that hold the JUDOKA's body in equilibrium position, the centre of gravity moves into a horizontal plane so that the projection of the centre of gravity falls on the maintaining area (EFGH-ABCD) we are in UKE's imbalance position, the one that the external force is acting on.

G-body weight

F_a-external force

F₁- component of the G force

F_t-tangential force

P-centre of gravity

P'-the projection of the centre of gravity

ABCD-supporting area

FGEH-maintenance area

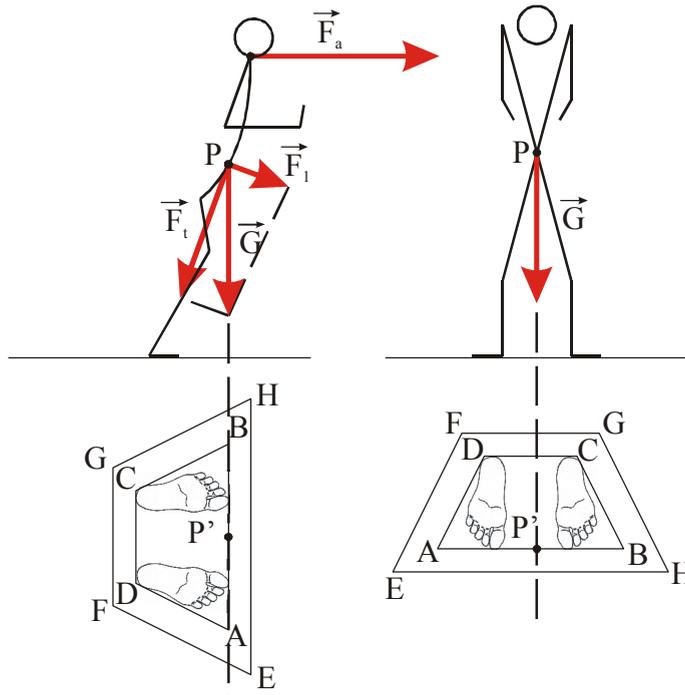


Fig 46

2.3.3 Disequilibrium

In the situation when the projections of the centre of gravity go away from the limits of the maintenance area, the muscular system of the JUDOKA cannot reestablish the vertical position and there comes the disequilibrium, or the balance split, followed by the athlete's fall.

In figure 47 we can watch the way the forces act in the disequilibrium position.

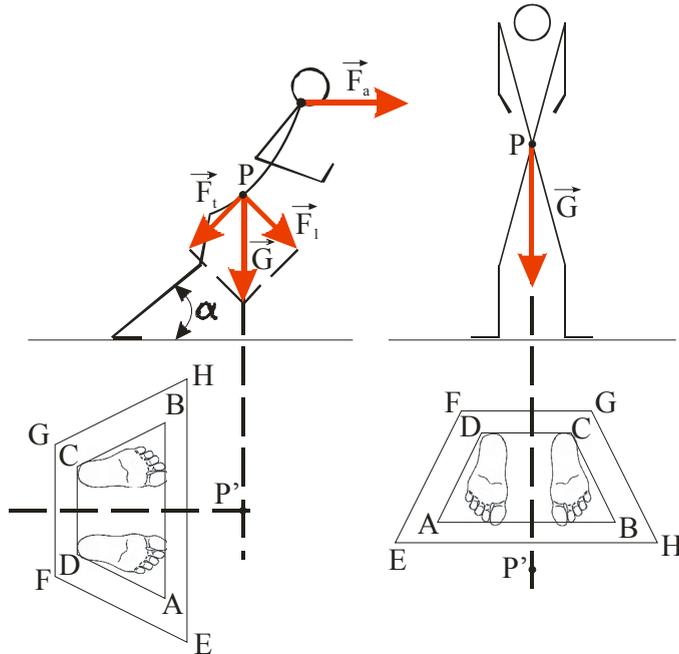


Fig. 47

Under the action of the external force F_a applied to the JUDOKA's body, an inclination of the body with respect to the vertical axis shows up and hence, the projection of the centre of gravity on the supporting area will fall outside. The weight G of the body will split in two components: F_t -tangential force which presses the body on the supporting area and the force F_1 , perpendicular to F_t , which, together with F_a , creates moments of clutter against the fulcrum, which lead to the fall of the body.

2.3.4 Applications of equilibrium and disequilibrium in JUDO

In the biomechanics substantiation of execution of JUDO throwing technique, the equilibrium of UKE and the disequilibrium created by TORI represent basic concepts in learning, improving, consolidating and applying a JUDO throwing technique.

In a competition, the unbalance created by TORI on UKE and the balance of UKE against TORI represent the entire mechanism that leads to a successful execution of a JUDO technique.

2.3.4.1 The disequilibrium of TORI during the attack:

In TORI's attack on UKE, we can identify the following situations of disequilibrium:

- a) Direct attack using a preferred technique
- b) Repeated attack using one technique
- c) Repeated attack coupled with a successive chain of other techniques
- d) Attack while UKE is in auto unbalanced position

a) Direct attack using a preferred technique

In this situation, the unbalance appears by applying an agent force on UKE which is large enough to overcome his internal force, materialized by a shifting of the projection of UKE's gravity centre out of the supporting area, producing the disequilibrium.

b) Repeated attack using one technique

In this situation, the disequilibrium is amplified by TORI's repeated attack on UKE. The first attack represents the first disequilibrium action while the second one amplifies it, obtaining a maximized efficiency of the action.

c) Repeated attack coupled with a successive chain of other techniques

TORI's repeated attacks are made by alternating the direction of the attack until an optimum unbalance of UKE is achieved, finalizing with a successful attack.

d) Attack while UKE is in auto unbalanced position

This type of attack represents the superior form of JUDO practice.

The attack is realized by TORI and involves successive moves which enable him to achieve UKE's unbalance only as a result of UKE's weight action. This type of attack has maximum efficiency.

2.4 The center of gravity of the human body coordinates

The centre of gravity satisfies all properties of a centre of parallel forces. According to the gravity falling laws, we have the following definitions:

1) The weight of a body is the resultant of the weight forces applied on that body

2) The centre of gravity is the origin of this resultant.

The position of the centre of gravity doesn't depend on the direction or the intensity of the parallel forces.

The position of the centre of gravity depends on its geometrical shape and the mass distribution

The centre of gravity of a rigid, homogenous and isotropic body is a fixed point, individualized by three Cartesian coordinates x, y and z.

$$X_{CM} = \frac{\int v X m v g dv}{P}$$

$$Y_{CM} = \frac{\int v Y m v g dv}{P}$$

$$Z_{CM} = \frac{\int v Z m v g dv}{P}$$

In the situation of a human body staying in vertical position, the centre of gravity is located in a plane that crosses through the L2 vertebra.

The center of gravity of the human body coordinates with respect to a reference system Oxyz are illustrated in Fig 48.

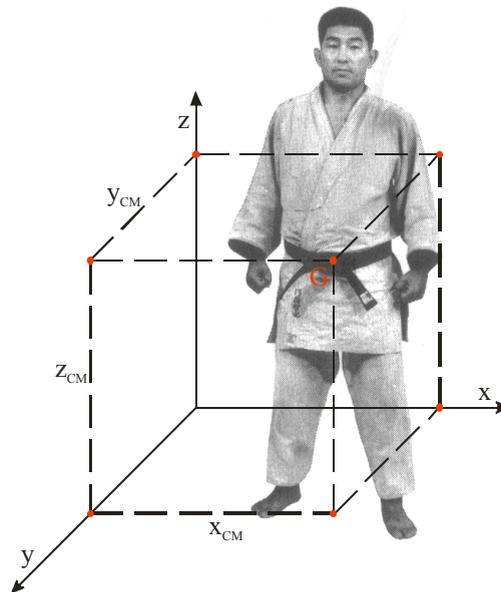


Fig 48

2.4.1 The importance of the centre of gravity in JUDO

There are two key elements involved in the execution of JUDO techniques:

- a) The torques-called levers
- b) The force couple

2.4.1.1 The torque-the lever

The lever is a simple mechanism with the aid of which a simplification of the active force is obtained.

In fig. 49 it can be stressed the importance of the fulcrum S in the execution of a technique by the force equilibrium that appears.

The more the fulcrum S is under UKE's centre of gravity C, the smaller is the active force that denotes the disequilibrium of UKE. The lower the fulcrum is, the bigger is the arm of force, creating a tipping torque that leads to the disequilibrium.

$$M_a = F_a \cdot d_e; \quad M_1 = F_1 \cdot d_2$$

$$M_a + M_1 \cong M_{\text{intern}} \rightarrow \text{disequilibrium}$$

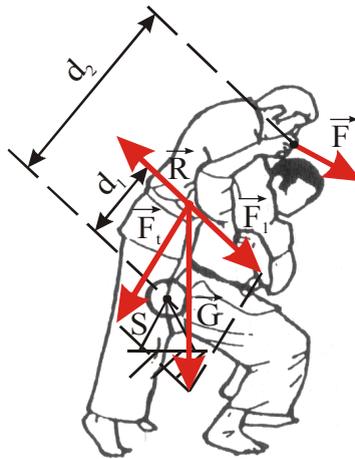


Fig 49

2.4.1.2 The force couple

The force couple represents two equal forces which have opposite directions and a distance d to the force applying support. The resultant of two forces of equal modulus and different directions is zero, but the forces produce a torque of which value is equal to the product between the force and the distance between the forces.

$$M = F \times d$$

According to the above formula, the value of the torque can be increased by increasing the distance d at the same force F acting in the couple, as illustrated in figure 50.

In this case, the execution of the technique is realized by the force couple applied to UKE with respect to TORI's centre of gravity.

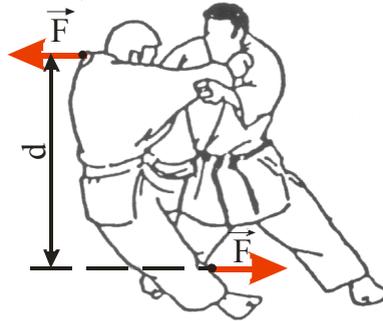


Fig. 50

CONCLUSIONS AND RECOMMENDATIONS ON THE BIOMECHANICS OF THE JUDO TECHNIQUES NAGE-WAZA

The paper “The substantiation of the biomechanics of JUDO throwing techniques” is intended to present the factors and mechanisms which represent the basis of the execution of a judo throwing technique.

There are some conclusions and recommendations that can be drawn from the paper, useful in the learning and improving process, but also in the competitive system.

a. The study and the application of scientific laws of biomechanics in judo represent a

necessity in the improving and the applying process of the judo techniques in competitions.

b. We cannot analyze the human body, in our case the JUDOKA’s body, as a mechanism on which torques and forces act, without analyzing the interconnections between the nervous, muscular, skeletal and articulation system

c. There are two basic mechanisms in the execution of any JUDO technique: THE LEVER and THE FORCE COUPLE

d. The efficiency of the throwing technique is proportional to the way these two mechanisms are applied, as well as to the state of the other systems: nervous, muscular, cardiovascular and respiratory system.

e. The principle that rules the execution of a JUDO technique involves a maximum efficiency with a minimum energy waste.

f. The execution of a JUDO throwing technique is based on the ability and the efficiency of the unbalancing action made on the opponent.

g. During the learning and improvement process, coaches must apply the biomechanics laws of simple mechanisms which occur in the execution of the JUDO techniques.

h. The correct application of biomechanics during the learning process will lead to a proper energetic efficiency of the JUDOKA.

i. There is no incompatibility between the teaching and pedagogical classification of JUDO techniques, paired in Kyus and the classification based on the simple biomechanical mechanisms: THE LEVER and THE FORCE COUPLE. These two systems complement each other.

j. A biomechanical approach to JUDO will lead to an improvement of the ways and the methods which deal with the sportive training factors, physical, technical, tactical and psychological training.

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STRATEGY OF STIMULATING STUDENTS CREATIVITY BY MEANS OF ACROBATIC SCHOOL GYMNASTICS

PAȘCAN IOAN¹, PAȘCAN ADRIAN¹

ABSTRACT. The paper starts from the assumption that the creative potential of students can be stimulated through means of gymnastics by using an appropriate strategy; in this respect some actual means are presented, applied during a lesson of physical education in secondary school. The research was conducted on 242 students, 122 boys and 120 girls, divided into the experimental and the control group. The research was conducted under normal circumstances as part of the physical education lesson, having gymnastics as a topic at school in Cluj-Napoca. The results of the research prove that we were able to stimulate the creative potential of the members of the experiment group by using our strategy. They exposed rich and pragmatic imagination by creating and applying specific exercises for developing psychomotor skills, by integrating free chosen exercises and physical skills tracks.

Keywords: *creative potential, inherent motivation, inhibitory factors, power of observation, flexible thinking, psychomotor skills.*

REZUMAT. **Strategia stimulării creativității elevilor prin mijloacele gimnasticii acrobatice școlare.** Lucrarea pornește de la premiză că, prin utilizarea unei strategii adecvate se poate stimula potențialul creativ al elevilor prin mijloacele gimnasticii, prezentând în acest sens o serie măsuri concrete, aplicate în cadrul lecției de educație fizică, ciclul gimnazial. În cercetare au fost cuprinși 242 elevi, 122 băieți și 120 fete, împărțiți în lotul experimental și lotul martor. Experimentul s-a desfășurat în condiții naturale în cadrul lecțiilor de educație fizică, cu tematică din gimnastică acrobatică, la o unitate de învățământ liceal din Cluj-Napoca.

Rezultatele cercetării dovedesc faptul că, prin strategia utilizată de noi, cu subiecții lotului experimental, am reușit să stimulăm potențialul creativ al acestora. Ei au dat dovadă de o imaginație bogată și pragmatică prin crearea și aplicarea exercițiilor specifice pentru dezvoltarea aptitudinilor psihomotrice, prin alcătuirea exercițiilor liber alese și a traseelor aplicative.

Cuvinte cheie: *potențial creativ, motivația intrinsecă, factori inhibitori, spiritul de observație, flexibilitatea gândirii, aptitudini psihomotrice.*

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General aspects

The requirements of modern everyday life and the urgent need to solve complex problems within all areas of life have turned the training of creativity into a priority, i.e. into a stringent need for society, within all fields of action.

As M. Ionescu (2000) shows „*At the moment a priority for educational sciences is the exploitation of potential creativity nuclea and training creativity in children of all ages.*” This approach aims at reaching the following general goals:

- Forming of a positive/adequate attitude towards progress, towards new elements and towards their introduction in ones actions;
- Their preparation to accept novelty as an indication of progress, of innovation and human creativity;
- Encouraging pupils manifestations characterized by original condition and results;
- Forming and developing the skills and abilities to create, to rethink work strategies and to integrate them in dynamic, flexible and efficient systems;
- Forming and developing abilities to create, to make something new: connections, ideas, theories, ideal or material models, material products and so on.

School is the main factor which can and has to contribute decisively to using students potential creativity and stimulating their creative talents and training creativity.

N. Jurcan (2001) expresses the same idea, showing that „*school should not be limited to providing knowledge and making pupils avoid failure, but has to take up the role of helping pupils to discover their own potential.*”

Reaching this complex goal implies restructuring the educational process at all levels by applying a systematic viewpoint. The systemic perspective is “*indispensible for rendering the elements which make up the educational process more modern and efficient in the perspective of a creative pedagogy.*” (Inonescu, M., 2001).

Within the educational process learning aims at intellectual as well as practival activity. The two aspects interdependant; the difference is only made in order to facilitate a better analysis, because „*intellectual activity can only be expresses under motor skills, and the best practice can only be produces under the control and control of the intellect.*” (Epuran, M., Holdevici, I., 1993).

Professor Mihai Epuran emphasizes that the field of human motor skills comprises also of intelligent and creative learning ways, besides gestured, motor and perceptive-motor learning, realised at the level of motor capabilities, skills or habits. It is about a complex learning process, within which the changes of mainly motor behaviour are reached by coordination (harmonization) of motor schemes with the intellectual ones, while the individual deliberately controls their movements „*using the knowledge, habits, skills totally according to the situation they find themselves in*” (Epuran, M., Holdevici, I., 1993).

A. Dragnea and A. Bota (1999) state something similar, saying that the cognitive activity accompanying learning of motor skills turns this kind of learning into a special kind, within which the skills acquired become operational means of solving a certain type of problems. Thus, the gestured learning and the motor learning realised at the level of capabilities, skills and habits is doubled by acquiring notions and concepts, which offer the subject the possibility to perform judgements and reasoning in problematic situations, while displaying creativity. By this motor learning becomes *„intelligent, creative, and motor performance is nothing else than a superior manifestation of fast and efficient learning skills, conditioned by factors of attitude (especially motivational).*

We only introduced a small part of the characteristics of motor learning, in order to point out the complexity of this process and to point out that within the field of physical education in school, and especially within gymnastics, there are actual means of stimulating and exploiting the creative potential.

Assumption

We assume that within gymnastics at the level of secondary school students the creative potential can be stimulated and exploited if the training strategies presented in the psycho-pedagogical literature are respected and adapted according to the sports branch.

Subjects and methods

The subjects of the research were students from the grades 5 to 8 from the „N. Bălcescu” highschool, Cluj-Napoca. The research comprised of 242 students, out of which 122 boys and 120 girls, divided into the experimental and the control group.

The samples according to grades can be seen in table no. 1. The age of the subjects is according to the four secondary school classes and lies within 11-14 years.

Table 1.

Samples according to grades

GRADE	BOYS		GIRLS		TOTAL
	Experiment	Control	Experiment	Control	
5th	17	17	16	16	66
6th	16	16	16	16	64
7th	14	14	14	14	56
8th	14	14	14	14	56
TOTAL	61	61	60	60	242

Conduction of the research

The research was conducted during November to March of the school year 2009-2010, at the above mentioned school.

The research took place under normal circumstances within the classes of physical education, with gymnastics topic, according to the structure of the school year, divided into semesters and following the suggested assumption.

Before continuing with creating the exercises specific for developing the psychomotor skills, we had the solving of the following important aspects in mind:

- Ensure favorable conditions to enhance inherent motivation and interest in gymnastics;
- Remove the inhibiting factors: fear of ridicule, timidity, lack of self-confidence, fear to make mistakes, discouragement, lack of perseverance and ambition;
- Enhance and develop the students' spirit of observation;
- Cultivate in students the courage to try and persevere;
- Fight prejudice, premature critics, original ideas;
- Encourage personal initiatives to discover what's new, to find new connections between apparently isolated entities;
- Develop fluency of ideas;
- Cultivate flexibility of thought;
- Create situations in which creativity can be manifested;
- Recognize and reward new ideas;
- Promote collaborative didactic relationships and ensure a favorable psycho-social environment for a good cooperation;

As far as the formation of intrinsic motivation and of interest in acrobatic gymnastics is concerned, we have considered a series of specific concerns, such as:

- Explain and prove the practical importance of the learned acrobatic techniques or of those that are being learned, in everyday life;
- Emphasize their importance in the development of conditional and coordinative motor skills, and of the mental skills;
- Underline the importance of acrobatic exercises in accelerating the learning of actions and techniques from other sports;
- Direct demonstrations performed according to the model.

In order to remove the inhibiting factors, we tried to create a relaxed, collaborative environment, and the students were constantly encouraged to answer questions without immediate assessment of their answers. They were also urged to ask various questions, to come up with new ideas, to find connections between different exercises and techniques. Their solutions were carefully analyzed, at the beginning only the positive aspects were underlined, and the children were congratulated.

With this attitude, we tried to mobilize also the children who were shy and lacked self-confidence. We also asked children to show tolerance for their classmates' opinions. They were taught to understand and be aware of the fact that they could act in different ways in certain situations.

In our research, the main directions in which we acted in order to stimulate and enhance the creative potential were the following:

- Create and apply specific exercises for the development of psychomotor skills, necessary to learn acrobatic elements;
- Create exercises for psychomotor skill development, which include the basic technical mechanism;
- Create exercises for psychomotor skill development, which represent parts of the technical elements;
- Find versions of known technical procedures by changing the initial position, the final position or by changing the position of one or more segments of the body;
- Attempt to connect technical elements in an original way;
- Develop diversified acrobatic lines;
- Develop an original optional floor exercise routine, which includes 2-3 acrobatic lines;
- Create physical skills tracks which include also simple acrobatic elements.

Results and Discussions

We are going to present in our paper, due to the lack of space, only the results achieved by the two groups in the following two directions:

- I. Development of an original optional floor exercise routine, which includes 2-3 acrobatic lines;
- II. Creation of physical skills tracks which include also simple acrobatic elements.

I. Development of an original optional floor exercise routine, which includes 2-3 acrobatic lines

The results achieved in making an optional floor exercise routine can be seen in table no. 1, and in figures no. 1 and 2.

Table no. 1

GRADE	BOYS			GIRLS		
	Experimental	Control	Difference	Experimental	Control	Difference
	Mean (X)	Mean (X)		Mean (X)	Mean (X)	
5 th	8.80	8.20	0.60	9.05	8.50	0.55
6 th	8.70	8.40	0.30	9.10	8.60	0.50
7 th	9.00	8.60	0.40	9.30	8.70	0.60
8 th	8.90	8.45	0.45	9.20	8.75	0.45

The arithmetic means of the experimental groups are higher than those of the control groups. The best scores were achieved by the 7th grade students: girls 9.30, and boys 9.00. We can see a slight regress in the 8th graders, both girls and boys.

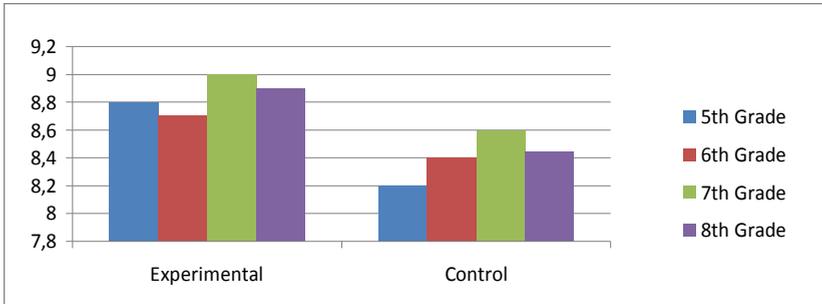


Fig. no. 1. Arithmetic mean of the results achieved in the floor exercise routine (boys)

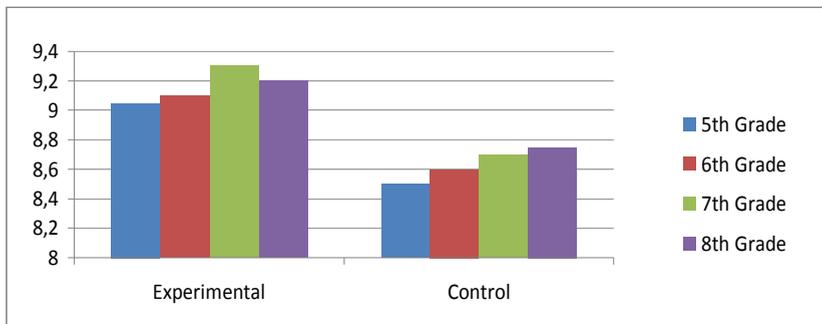


Fig. no. 2. Arithmetic mean of the results achieved in the floor exercise routine (girls)

II. Creation of physical skills tracks which include also simple acrobatic elements

The results achieved in creating physical skills tracks can be seen in table no. 2, and figures no. 3 and 4.

Table no. 2

GRADE	BOYS			GIRLS		
	Experimental	Control	Difference	Experimental	Control	Difference
	Mean (X)	Mean (X)		Mean (X)	Mean (X)	
a V-a	8.70	8.30	0.40	8.80	8.50	0.40
a VI-a	8.90	8.40	0.50	9.05	8.60	0.45
a VII-a	9.20	8.60	0.60	9.15	8.65	0.50
a VIII-a	9.30	8.65	0.65	9.25	8.70	0.55

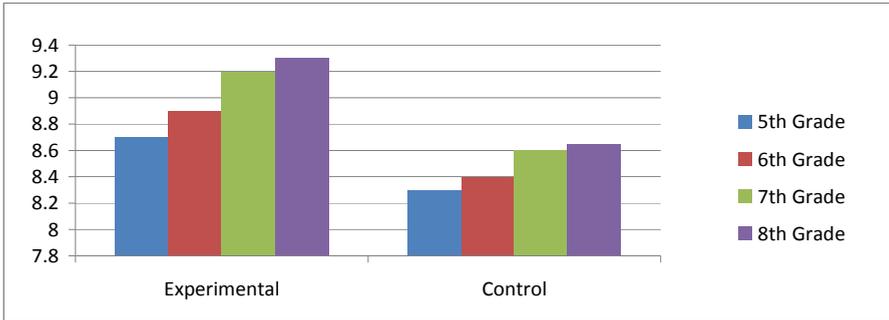


Fig. no. 3. Results achieved in physical skills tracks (boys)

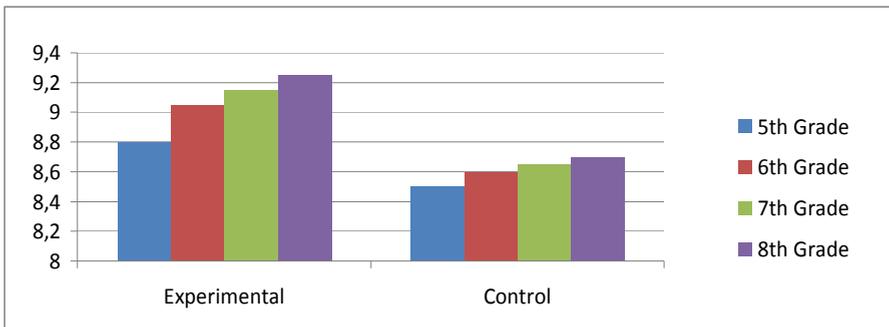


Fig. no. 4. Results achieved in physical skills tracks (girls)

The results of the experimental group are higher than those of the control group, both boys and girls. The 7th grade and 8th grade boys have higher scores than the girls. There is an ascending progress from one grade to another, in both groups.

Conclusions and Recommendations

1. Psychomotor skills are formed and developed by creating and applying an optimum and efficient number of specific exercises.
2. In order for the secondary school students to be able to create specific exercises for psychomotor skill improvement, several specific steps must be taken to develop their creative potential, of which we mention the ones that we believe to be the most important ones, such as:
 - Development of the students' spirit of observation;
 - Development of fluency and flexibility of thought;
 - Raise interest and positive attitude towards acrobatic gymnastics and towards everything that is new and useful;
 - Create and have the subjects face new problems and solve them, with or without their teacher.

3. Due to the actions taken in order to develop and enhance the creative potential, the subjects of the experimental group showed a rich pragmatic imagination in creating and applying specific exercises for psychomotor skill development, in creating optional routines and physical skills tracks. (see tables 1 and 2, figures 1-4)

4. We propose in the acrobatic gymnastics methodology the line approached by us, which consists in placing an emphasis on the development of psychomotor skills in students through creative exercises as a prerequisite for effective learning of techniques.

5. In order to stimulate and enhance the creative potential of secondary school students in acrobatic gymnastics, we propose the strategy that we used and presented in our paper.

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PILATES METHOD STUDY ON THE EFFECTS ON HEALTH IN YOUNG

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ABSTRACT. The beneficial effects of exercise practice were identified at both psychologically and in terms of health, body image and social interactions. They are supported by a study of the consequences of inappropriate lifestyle such as inactivity. Movement is a means of disease prevention and health maintenance by providing appropriate body fitness and wellness maintenance. Physical activity is often ignored because it takes time and effort, but its importance in health cannot be neglected. First she must become a means of maintaining wellness. Striving for a healthy lifestyle that includes exercise as an important component of lifestyle are increasing. These highlight negative consequences because of both sedentary and because of the positive effects of practicing physical exercises. It is well-reasoned way, choosing to engage in physical exercise, which must be an automatic for everyone. The paper aims to highlight the beneficial effects it has on health Pilates gymnastics injury. To highlight this benefit was designed a kinetic program of exercises from Pilates method has been applied over a period of 12 weeks where some parameters were measured as effort and applied a questionnaire. The data drawn from the experiment demonstrated the effectiveness of Pilates gymnastics means to improve health.

Keywords: *Pilates method, health, kinetic program*

REZUMAT. Studiu privind efectele metodei Pilates asupra stării de sănătate la tineri. Efectele benefice ale practicării exercițiilor au fost identificate atât psihologic, cât și în ceea ce privește imaginea sănătății corporale, și a interacțiunilor sociale. Acestea sunt susținute de un studiu cu privire la consecințele de stil de viață necorespunzătoare, cum ar fi inactivitatea. Mișcarea este un mijloc de prevenire a bolilor și de întreținere a sănătății prin asigurarea unui program adecvat de fitness și wellness de întreținere. Activitatea fizică este adesea ignorată, deoarece este nevoie de timp și efort, dar importanța sa în domeniul sănătății nu poate fi neglijată. În primul rând ea trebuie să devină un mijloc de a menține sănătatea. Lupta pentru un stil de viață sănătos care include exerciții fizice ca o componentă importantă a stilului de viață sunt în creștere. Aceasta evidențiază consecințe negative din cauza atât a sedentarismului cât și din cauza efectelor pozitive ale practicării exercițiilor fizice. Lucrarea își propune să evidențieze efectele benefice pe care metoda Pilates le are asupra sănătății. Pentru a evidenția acest beneficiu a fost conceput un program kinetice cu exerciții din metoda Pilates, a fost aplicată pe o perioadă de 12 săptămâni, au fost măsurați parametrii de efort și s-a aplicat un chestionar. Datele extrase din experiment au demonstrat eficacitatea exercițiilor din gimnastica Pilates ca mijloc de îmbunătățire a sănătății.

Cuvinte cheie: *metoda pilates, sănătate, program kinetic*

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Motivating theme choice

The reason for choosing Pilates exercise program as a way of developing healthy lifestyle is that I work as a physical education teacher and found that regular practice of this form of movement can help prevent and treat various physical conditions acquired during life. That's why I want to improve in this area and I contribute to promoting a healthy lifestyle that includes exercise and practicing Pilates method.

The research was conducted on a group of 30 people (girls), students at the Faculty of Political Science and Public Administration, the second year of the Babes-Bolyai University, Cluj-Napoca, aged between 20 and 30 years who participated in physical education classes in the school curriculum.

Batch of students was divided into two groups of 15 people, a group representing the control group who took part in physical education classes but not the kinetic program and another group representing the experimental group in physical education classes, the 2 times a week participated in a program consisting of kinetic exercises in Pilates method for improving health.

Survey method was used in this paper was applied directly to individual questionnaire applied in indefinitely. Questionnaire Short Form 36 (SF-36) is a generic health measure, developed and tested by New England Medical Center in the doctor Outcomes Study, which used eight scales: physical function, social function, role limitation (the question physical and emotional), mental health, energy, somatic pain, general health. This model has three levels: -32 Items (questions) -8 Scales that aggregate items Generic concepts that aggregate scales -2

The questionnaire were processed by the body belongs to health (physical).

These indicators are:

1. Physical Functioning = physical functioning (PF) - item 3
2. Physical Role = role physical (RP) - item 4
3. Pain Body = body pain (BP), item 7
4. General health = general health (GH) - item 8

Method of testing

Mathematical and statistical and graphical method

Kinetic Program (Pilates exercises)

The research was conducted over a period of 10 weeks (October 2010 - December 2010) at the Faculty of Physical Education and Sport, aerobics room.

We've put together a program that contains exercises based kinetic used in Pilates Method. These exercises include a series of movements and positions that have included because they are simple, is open to all persons regardless of physical training and health they have, and have no contraindications.

The program was conducted over a period of 10 weeks of 2 sessions per week, during a 45-minute sessions.

We chose a group of 15 original movements are the "Mat work" (mat exercises) which are aimed at reducing pain in the spine by improving its flexibility and more, toning muscles, correcting poor jobs and reduce stress.

RESULTS

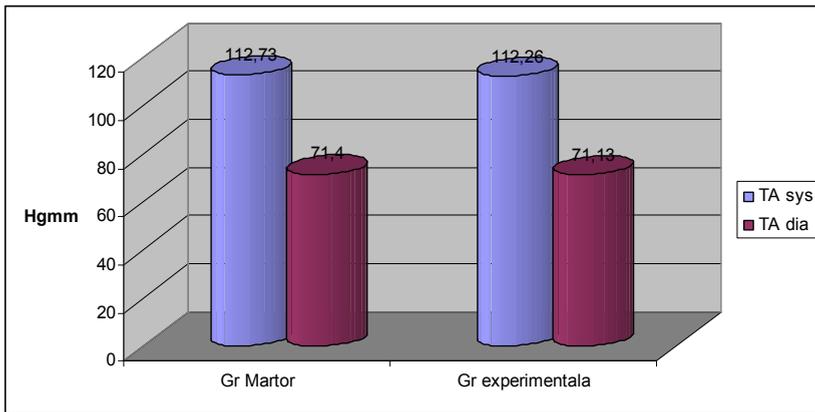


Figure no. 1 - systolic and diastolic preefort the two groups

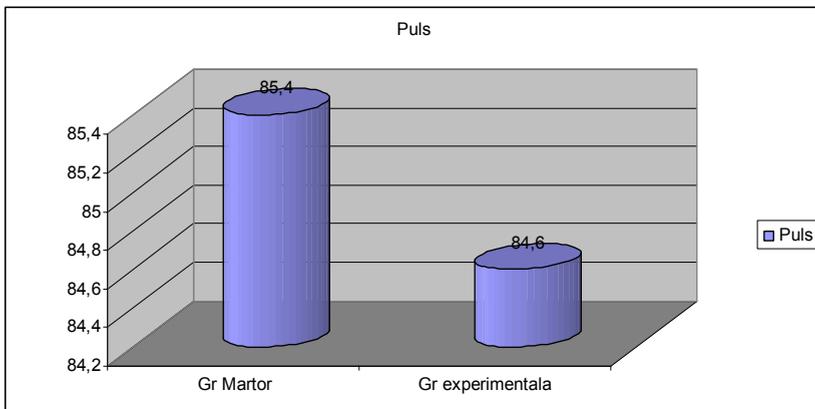


Figure no. 2 - Pulse of the two group's preefort

NUȚ RAMONA ANCUȚA

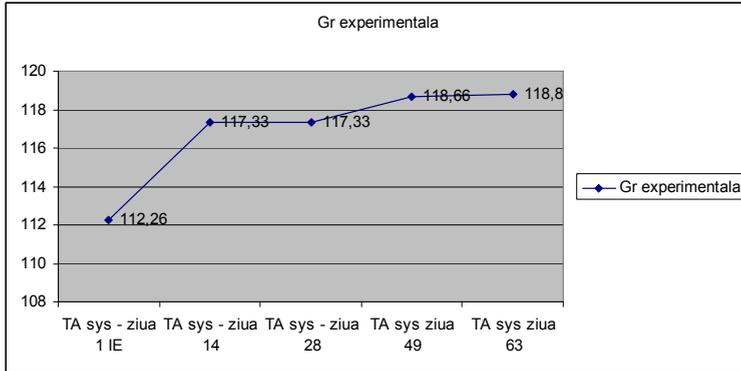


Figure no. 3 - Evolution of systolic BP during the experiment - the experimental group

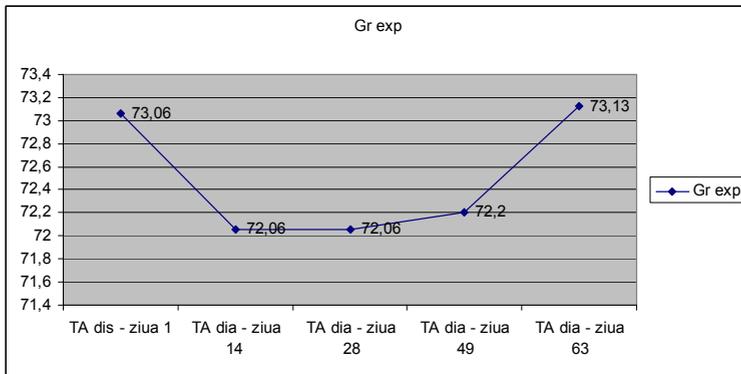


Figure no. 4 - The evolution of diastolic BP during the experiment - the experimental group

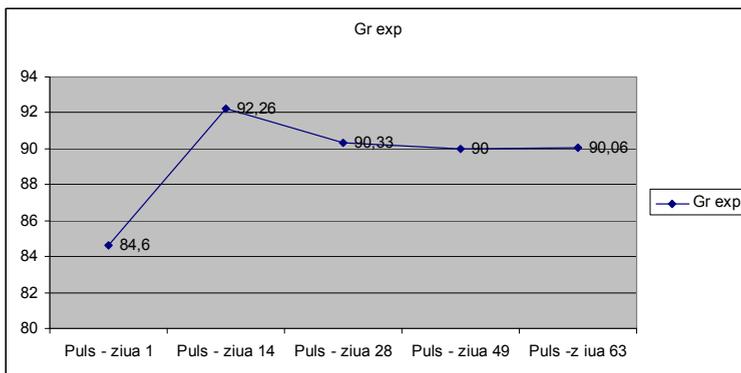


Figure no. 5 - Evolution of the pulse during the experiment - the experimental group

There is a positive correlation between the indicators, which is significant at $p = 0.05$ threshold. There was an improvement in exercise capacity after application exercises.

Questionnaire results

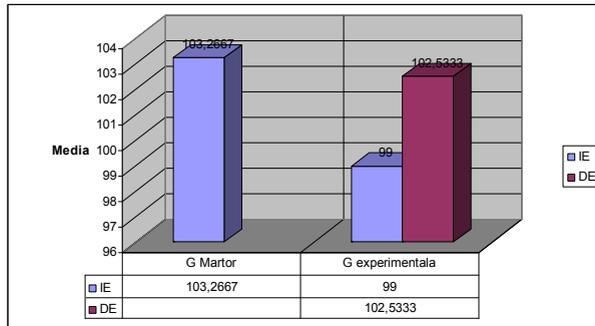


Figure no. 6 - Means testing the control group and experimental group

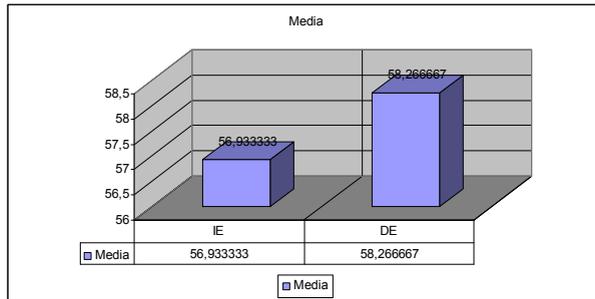


Figure no. 7 - Average pre-test and post-test score - the experimental group

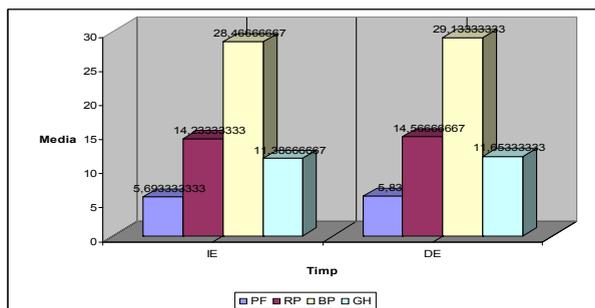


Figure no. 8 - media component "body Health" pre-test and post test - experimental group

Following statistical analysis has found that:

- There was an improvement in exercise capacity after application exercises.
- A weight loss
- During the course attendance, no illnesses have recorded the participants, their health has improved.

CONCLUSIONS

In conclusion to those presented in this paper, we point out that beneficial effects on physical activity gym or practiced Pilates regularly have on the body are complex and substantial health benefit.

The data drawn from the experiment demonstrated the effectiveness of Pilates method means to improve health through a dynamic, friendly and very loved by the subjects of the experiment.

The beneficial effects of practicing Pilates exercises have been identified at both psychologically and in terms of health and body image. They are supported by the study of the consequences of an inappropriate lifestyle such as inactivity. Movement is a means of disease prevention and health maintenance by providing an appropriate body fitness and well-maintained. Pilates helps improve posture, increase muscle tone, improved breathing, and blood circulation and eliminate toxins from the body practically. It also helps in weight loss, but more in inches, which seems more important to me because no matter how much you weigh if muscle mass is not distributed right. Pilates improves flexibility and mobility is very important for our body.

Without taking into account other shortcomings due to lack of movement and exercise, it can be concluded that strengthening health art as a means of "conservation" of life, strengthening the physical body and maintaining a healthy mind is that of a daily physical training with active role in disease prevention and treatment of diseases often, protecting and strengthening health, opposing aging and prolong life.

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EFIT SOFTWARE BODYBUILDING-FITNESS COMPUTERIZATION HALLS - CONCEPT AND APPLICATION

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VOICU VIRGIL ALEXANDRU³

ABSTRACT. eFit application is designed for computerization bodybuilding and fitness rooms, is an original conception of IT applications by designing a software application specific software that consists of two modules (cores) working in tandem. BackOffice Module is a software management module and is invisible to the user, but showing great utility for the administrator, through it is system being introduced in all subsequent data will be accessed by the user. It allows defining and managing users and security policy and define the types of subscriptions, subscriber management, exercise programs individualized, viewing and printing reports. FrontOffice module has an interface through which users interact with the system. Access to the application is made by each user based on an access card with a unique bar code assigned.

Keywords: *computerization, bodybuilding, software, monitoring training*

REZUMAT. Informatizarea sălilor de culturism - fitness cu aplicație eFit - concept si aplicabilitate. Aplicația eFit este destinată informatizării sălilor de fitness-culturism și reprezintă o concepție originală de aplicație a IT, prin proiectarea unui software specific în care aplicația informatică este alcătuită din două module (nuclee) care lucrează în tandem. Modulul *BackOffice* este un modul de administrare a aplicației, fiind invizibil pentru utilizator, dar prezentând o deosebită utilitate pentru administrator, prin intermediul său introducându-se în sistem toate datele care ulterior vor fi accesate de către utilizator. Permite definirea și administrarea utilizatorilor și a politicii de securitate, precum și definirea tipurilor de abonamente, administrarea abonaților, programelor individualizate de efort, vizualizarea și tipărirea rapoartelor. Modulul *FrontOffice* prezintă o interfață prin care utilizatorul interacționează cu sistemul. Accesul la aplicație se face de către fiecare utilizator pe baza unui card de acces având un cod de bare unic alocat

Cuvinte cheie: *informatizare, culturism, program informatic, monitorizarea antrenamentului*

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Software concept

EFit application was developed based on the concept of monitoring of sports training using computerized means. Monitoring is intended to streamline the process of training, a dynamic adjustment effort in the training unit and the individualization of training depending on individual needs at some point.

The development of this software was done in two ways: monitoring specific training and fitness and bodybuilding noncompetitive monitoring indicates that morphological and functional.

EFit application allows each user can choose a specific type of training, depending on the personal level of physical training. Were developed three main categories of training: training for athletes beginners, workouts for athletes who are training intermediate and advanced training for athletes. An important aspect in developing the training plan is that each user can receive a personalized training plan, even if he opted for a particular type of training. (Example: even if a user chose a training plan for athletes are in the intermediate stage of training, it will be modified according to individual features of the athlete and will be coded "2673 Intermediate Training Plan", the figures representing the last sequence of code assigned unique bar.) (Herlo, J.N., 2011, pp. 13) All versions individualized workouts are stored in a database that can be accessed at any time based on a password access.

In terms of morphological and functional indices monitoring, eFit application was developed for registration and determination of morphological index and body mass index, the Hirtz index of elasticity chest, perimeters of the body segments and indicators functional (TA and FC), in their dynamics, as determine the training session before starting and during it and after exercise.

In monitoring and stewardship effort in sport is important response to the stimulus given individual. In this respect, we believe it is imperative that we get a change of training tasks in real time. To solve this task we turn to eFit application, such as application software, developed specifically for this purpose. This application allows the user to interact with the computer system and can reduce the intensity of effort in daily training, with a touch a touch screen. It is noted that this feature of the application is useful, with a very practical character, because it allows immediate determination of effort, depending on the user's need time.

eFit monitor morphological indicators such as body mass index, the index of elasticity chest Hirtz, perimeters and indices functional body segments (TA and FC), in their dynamics, are determined before starting the training session and during it and after cessation effort. (Herlo, J.N., & Mihailescu Liliana, 2011, pp. 607)

In developing eFit, I thought a software feature, reflected in the user information via electronic mail on the training program held on the same day. Following analysis by sports training content for the current day, it may require the system administrator, change the structure and content of training units.

Component software to run in order to solve the tasks for which it was developed, requires a computer system and certain devices.

Hardware Components Structure

EFit hardware needed for the applications is made up of a suite of devices that were selected and tested to the highest degree of compatibility exists between them, eliminating the risk of errors due to hardware incompatibility conflicts and especially the drivers of their they serve.



Figure number 1 Hardware structure

Software Components Structure

Software component consists of two software modules that together form eFit. The first module, BackOffice is a software management module and is invisible to the user, but showing a special administrator utility. Accessing this module is secured with a password.

BackOffice module will be managing the database. The application will run on a server with Windows XP Professional operating system using ASP.NET technology with a database Microsoft SQL Server 2005 Express. The main features of BackOffice module are:

- ✓ introduction and modification of users,
- ✓ introduction and modification of training program,
- ✓ introduction and modification of the preparedness,
- ✓ introduction and modification of training schedule
- ✓ introduction and modification level of access to application,
- ✓ report generation. (Herlo, J.N., 2011, pp. 113)

Database application, is the core software and stores all data administered and collected by FrontOffice module.

Use, called FrontOffice presents an interface through which the user interacts with the system. Access to the application is made by each user based on an access card with a unique bar code assigned.

Initial registration is required by the administrator of each subscriber in the system. If the type of subscription assigned to the subscriber is given a questionnaire will be completed by the subscriber, before you can access the fitness room services.

The way work of eFit application will be following the next algorithm:

Step 1. Subscriber access scan their code. The code and subscriber identify and submit required data on the touch screen.

Step 2. The system identifies a questionnaire on the type of subscription.

Step 3. If there is an active partner questionnaire, the subscriber will answer the questionnaire in order to access personalized workout plan.

Step 4. On leaving the gym subscriber will scan the unique identifier for record output. (Herlo, J.N., 2011, pp. 40)

eFIT applicability

Identification of subjects based on unique access code assigned

Each topic is assigned a card with a unique bar code, with which you can log in any time the system log that allows viewing personal training program for the day.

Recording in the database of all training programs conducted

Training programs developed individually for each user are stored in a database, possibility their subsequent consultation by any person which allows administrator access rights.

Sending automatic daily personal training program, in electronic format, each topic, e-mail

This feature automatically sends the application eFit daily e-mail a document to each user. Thus, the user can view electronic format, the entire training program assigned day.

Monitoring of somatic and functional indices and the development of dynamic reports on their

From time to time, is recorded as a result of joint determination (automated and manual), somatic indices following values: body mass index of elasticity chest Hirtz, body mass index, arm perimeter, perimeter abdominal, thigh area, perimeter leg.

Functional indicators are monitored: systolic and diastolic blood pressure and heart rate, they are determined effort before, during and after this effort.

Possibility of grouping the subjects in a specific category: novice athletes, athletes who are training in intermediate stage and advanced athletes.

This option can be selected when the type of training allocation. Thus each subject may opt for a certain type of training, depending on the personal level of physical training. There are three categories of training: training for beginners athletes, athletes who are training for medium stage of preparation and training for advanced athletes.

Choice of predefined states "weather-sensing" and / or "tired"

At the beginning of each workout, the user can choose a predefined condition "weather-sensing" and / or "tired". Each state is allocated a predetermined percentage decrease in the intensity of training. Selecting one of these options reduces the default rate with exercise intensity, and select both options combined will reduce training intensity. (Example: select state "weather-sensing" - 15% reduction in training intensity state selection "tired" - decrease workout intensity by 20%, selection of both state-intensity exercise decrease by 35%).

Determination and automated registration in a database of body mass

Determination of the automated body mass may be made at any time of day, just before or after completion of training, the only condition being that the personal card scanning for recognition by the system user. This, after reaching the virtual button "weighing" located on the touch screen, the system will be warned by the message "Please sit on the scale." After climbing the weighing platform, in seconds the system will determine the user's body weight. If that day is scheduled to create a regular personal records of the athlete, the value displayed on the screen, expressed in kilograms will be automatically saved in the database, user account, stating the date on which it was registered. Communication protocol between weighing platform and protocol number 17 system is implemented in memory Dibal weighing platform, application that enables communication between devices is Microsoft Hyper Terminal.

Direct interaction between the computer system and the subject

The most important feature of the software eFit is the direct interaction between user and computer systems. The subject is able to start training unit to achieve a virtual button on the touch screen, thus decreasing the intensity of effort.

Moreover, at any time of day, after having logged on the system is able to determine their body mass by tapping the button virtual "weigh" information system displaying the message "Please sit on the scale!" After this step the application displays on the screen for a few seconds of the subject body weight, then returns to the screen.

If a user is entered in the database of a particular eFit but does not have assigned a valid exercise after logging, the system will identify and interact with it saying "Welcome....." will display the estimated duration of exercise, and also sending the following message "You not have defined a workout! "

To ensure confidentiality of personal information, we expected that after displaying the current day training planned to achieve virtual button "OK" the system will display the main screen, but will store the current position of the subject activity. This system allows use by multiple users at virtually the same time, viewing only the personal data. Each of the subjects can see the current exercise, including number of series to be performed. The system marks with red color the current row, and displays the following message at the end of training "You have finished training!" (Herlo, J.N., 2011, pp. 43)

Practical testing software

eFit application was tested on a group gym mixed, composed of 19 subjects, with representatives from all classes (beginner athletes, sports are the average stage of development, advanced athletes).

Following testing, the eFit were highlighted certain limitations: the lack of possibility to increase the intensity of effort automated (by tapping the touch screen), the need for card scan each time the system returns to the gym (except when there many users login simultaneously).

Following the detection limits of the software, we do correct them by re-editing of sequences of software code.

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SOCIAL AND PSYCHOLOGICAL ASPECTS OF THE SPORTING PHENOMENON. THE LAWN TENNIS' CASE

BACIU ALIN¹, BACIU CODRUTA ROXANA¹

ABSTRACT. In the specialty works of the sociology of sport domain, the following main aspects are to be found, aspects related to the intersection of sociology and social psychology – treated also in the books of our country – sometimes under the title of sociology (see Mișu, 1967, 2000), other times in the social psychology books (Neculau, 2003; Chelcea and Iluț, 2003).

Keywords: *violence in sports, audience, number of watchers, the sport group's psychology, social factors of the success in sports.*

REZUMAT. Aspecte sociopsihologice ale fenomenului sportiv. Cazul tenisului de camp. Lucrarea tratează aspecte ce țin de intersecția dintre sociologie și psihologie socială - violența în sport, publicul spectator, numărul telespectatorilor, psihosociologia grupului sportiv, factorilor sociali ai reușitei în sport. În cele ce urmează sunt tratate succint cele care se pot aplica mai bine în cazul tenisului, ca sport mai mult individual și fără contact direct dintre competitori.

Cuvinte cheie: *violența în sport, publicul spectator, telespectatori, psihosociologia grupului sportiv, factorilor sociali ai reușitei în sport*

In this article are treated concisely those aspects which can be applied better in the tennis' case, being more like an individual sport without a direct contact between competitors.

a) The studies regarding the violence in sports refer, on one hand, to the violence on the sports field and, on the other hand, to the violence of the public. In what concerns the first aspect, in order to explain the aggressiveness, one resorts to the theory of frustration and direct instigation. One also appeals to the difference between the instrumental aggressiveness (in "cold-blood", aiming at a pragmatic purpose, well-determined) and the emotional aggressiveness. (Mitrofan, 2003). At football games, one can see how sometimes a good striker is deliberately annihilated in order to be pulled out of the game (instrumental aggressiveness), other times, a player just can't control himself and, because he was hit, hits back (emotional

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aggressiveness and response to a direct instigation. A disputed issue is whether the sports which, by their nature, suppose violence (boxing, wrestling and so forth) have a catharsis effect. By fighting, by rules, in the ring, or watching that fight, does it really mean that one would be less aggressive on the street, at school, in the family, at work? R. Thomas (2002) sustains that the results of the research on this topic are controversial, but the social psychologists (Taylor et al., 1994; Baron and Byrne, 2000) declare that the large majority of studies indicate a negative answer, for both the sportsmen and the public. In what concerns the cases of public's violence, the frustration and the anger due to the fact that the favorite team lost are set forth, together with the feedback to direct instigation. However, the violence of the fans may have some particular explanations. For the notorious phenomenon named hooliganism in Great Britain, one puts forward, for instance, the next explanation (Thomas, 2002): "Football was, in a large measure, a symbol of the working English class, it was an important piece of its culture. Alongside with its transfer in the sponsors' hands, in the tradesmen's hands, one part of this class revolts against losing an important asset." At large, on the same level, the act of being a fan (and being a hooligan) is perceived as "against the culture" and a form of collective movement (Mihu, 2002). However, research showed that, in some cases, the aggressiveness against the opposite team is not at all a spontaneous emotional reaction, possibly hardened by alcohol consumption, but an organized violence, with sophisticated weapons: thus, an instrumental one, which aims at the referees. (Thomas, 2002)

b) In what concerns the direct audience, specialty studies tried to decipher the causes for which people are present on the fields, in sports halls, ice-rinks and so on. One simple and valid explanation is the fact that sport represents itself a show, it has an amusement function, and "it raises the adrenaline". But there are other reasons that also matter very much. Psycho-sociologists sustain that identifying oneself with a certain team or player is fundamental. It implies many sides, starting from the national identity, of the social type, of club, of an adored sportive personality. Nonetheless, there is here a more subtle psycho-social phenomenon, that which consists in using (being warmed up by) the glory of the others (*basking in the reflected glory of others*). This phenomenon supposes boasting in front of our eyes and in front of the others about the qualities and the successes of the impressive persons and institutions. (Baron and Byrne, 2000). Researchers have questioned themselves in what measure the esthetic qualities and movements of the players (contestants) do represent an attraction point for their participation to the contests. These qualities matter to a certain degree, but their identification with the favorite teams or contestants and the desire for their victory are more important factors by far (Kazdin, 2000).

c) Nowadays, the number of the TV spectators at the sports manifestations has grown enormously. At the end of the 20th century, in France and in the USA, the percentage of the persons aged between 12 and 74 interested in viewing sports manifestations was approximately 70% (Defrance, 2000). Sports on television are consumed in a far larger measure by men than by women. Without detecting

significant social-professional differences in global audience, they exist when one refers to women and men's situation according to the social class. J. DeFrance states that, since in popular classes, male domination is more pronounced, they impose to their wives or sisters the TV shows that they want to watch – most of them sportive; thus, willing or not, the discrepancy between women and men in viewing sports is not too big. On the other hand, in the social groups which are more qualified and educated, where the equality between man and woman is bigger and, consequently, male domination is weaker, the discrepancy in viewing TV shows is more pronounced. However, the weight of the audience – sustains the same author – depends very much on sports type: rugby, cycling, football and motorized sports have a public composed to a greater extent by men, tennis and skiing have a similar impact on both men and women, while gymnastics is watched more by women.

In what concerns the relation between sports and media, particularly between television and tennis, B. Heimermann (1982) made a few decades ago the observation that, together with the equipment industry and the sponsors, the transmission channels were putting pressure on the organization of the sports races. In a way, they tend to replace the federations and the specialty forums by imposing, for instance, the “tie-break” formula, new ball and racket types, for the show. Also in order to make everything more “interesting”, demonstrative games are being organized, matches between the best tennis players in the world, between the former and the current champion (for instance, in Las Vegas, in 1972, between Laver and Connors). After the 80's, the collision between sport, media and business became more conspicuous in a way; however, it seems that the problem is not so much the substitution, but the negotiation between the sportive forums, the trading ones and the elite players, who are earning tremendously, especially from commercials for different companies which are selling sports materials.

d) A major direction in the sociology of sport would be the psycho-sociology of the sports group, with its problems regarding the relation between leader and team - leader as both game leader on the field, and coach. Many papers also refer to the social-affective relationships inside the group, applying successfully the concepts and the methods of the sociometry (see, for instance, Mureşan, 2003). In tennis' case, the psycho-social aspects concern first of all the relation between coach and player, since this sport doesn't suppose team sport, only the double. We are talking less about the important problem of the game team cohesion, which is present in other games.

e) One problem which is particularly complex and aimed by the sociology of sport is the problem of the social factors of the success in sport. By showing that, unlike the biological and psychological factors of the success in sport, the social ones were less studied, W. Thomas (2002) finds that the following are more important:

The filtration by affiliation to the class with respect to the insight in the elite sport is first of all made by the fact that the access in the federal system is easier if one is a graduate. But most of the parents from upper classes, as well as

children, have diplomas (academic degrees) for higher studies in sport. Complementary to this is the fact that young men belonging to disadvantaged classes and categories are obliged to work early, so they can neither access the specialty studies, nor have the time in order to devote themselves to high performance sports. Things are different though in the relation middle class – upper class. Parents from the middle class, having a little economic possibility, mobilize all the resources for their children to access the elite sports, relying on a leap in the quality of life and in the social prestige. Many researches (see Thomas, 2002) show that the sportsmen who come from the middle class are statistically better represented in the sport of performance, at least at the Olympic level. The working class is disadvantaged not only by the effect of the period of instruction, but also by the fact that the sport of performance requires investing in equipments, hours of trainings, traveling, cantonments and so on. Also because of this fact, the social classes and strata differ, relying on types of sports of performance.

Religion is mentioned in a Weberian way, namely by the fundamental difference between the Catholic and Protestant conception, the latter urging to activism, performance, realization during life on earth. The studies that were made showed that the Protestants are statistically better represented than the Catholics in terms of elite individual sports.

The family environment, in the same measure by the influence of bigger brothers or sisters – who can serve also as models of the realization in life through sport, but also as a precise support – and also by parents' attitude, is a decisive factor. Often quoted on the same line is the paper of the American psycho-sociologist B. Bloom (1985), a result of an arduous research concerning the success in many fields: plastic arts, music, sports, science. The fundamental conclusion is that parents decide decisively the success in the sport of performance by many ways: coming almost exclusively from middle and upper classes, they have material means which can be used in order to invest early in the practice of sport of their children; parents inoculate them values which lead to performance, such as independence, the need of succeeding in life, effort, competition; in addition to the financial support, they grant their children a constant psychological one, encouraging, giving them comfort, mobilizing them. Most parents were sportsmen themselves, some of them even high performance ones, so the granted support is also of high performance. One may anticipate that for children who are playing high performance tennis in Cluj-Napoca, the above description matches perfectly.

The social differentiation is highlighted also in the high performance sport. First of all, with few exceptions, such as acrobatic gymnastics and rhythmic gymnastics, the number of men in different sport branches is bigger. Then, men are superior to women concerning the results in sports races. Men's world volleyball champion beat women's world volleyball champion at any time. Not to mention football. In individual sports, the difference is even more obvious. Each time Jimmy Connors met Martina Navratilova, he defeated her, despite him giving her odds. The

main explanation lies in the fact that performance in sport consists fundamentally in strength and physical skills, and men are superior by nature in this way. It isn't less true that gender stereotypes come into play to women's detriment. Women are appreciated for their delicacy, smoothness, beauty, eroticism. Early socialization and then the requirements of the social environment move the woman to the domestic and marital career, and not to the professional and sportive performances; or if it's about success, then to choreography, music, theater. However, this image is pretty classy nowadays; due to the feminist movement, things changed quite radically in sport too. More and more young women become part of the elite sport, their participation to the Olympic Games, for instance, being on the increase. Women's access in the elite sports world differs according to the types of sport. In France, sports in which women have a bigger rate of participation are, in order: rhythmic and sport gymnastics, tennis, badminton, basketball, swimming, table tennis and volleyball (Thomas, 2002, page 91). One can stress that, despite the fact that women are increasingly gaining ground as direct probationers of the performance sport, things are different in terms of leading functions in the world of sports and especially in coaching. Desiring that the teams or the sportsmen who compete individually have better results, one looks for men coaches. Thus, for instance, in the U.S.A., at university teams, which have there a national prestige, in five main sport branches (athletics, basketball, softball, tennis and volleyball), the number of women coaches decreased from 1978 to 1988 with nearly 20%. In tennis, in 1978 there were 72.9% women and in 1988, 52.2. At least in tennis, this tendency continues nowadays too. The inequality in women's detriment is showed by the fact that, as well as in other working domains, at the same qualification level, women coaches and other female persons who have sportive positions are paid less.

The differentiation by cultures and countries. The statistics of various nations' international successes, for which the Olympics classifications are eloquent, show the domination of big and developed countries. It comes clearly into sight how much the economic factor mean. Almost all sports involve, at the level of national picked team, enormous financial expenses and advanced technology. On the other hand, the possibility of recruiting sports talents is bigger in a numerous population. Success in sports is determined, though, by the simultaneous achievement of some conditions and factors which have different weights related to types of sports. Maybe the geographical environment condition too, reflected in human's body morphology, says its word. In this way, the successes of the Kenyan sportsmen in marathon or of the northern people at skiing are demonstrative. When various competitions which take place at high heights are organized, people who are accustomed to those conditions are favored. The tradition of the national schools from one domain counts too. The Czech Republic's case at tennis is a good example. However, the social-cultural elements also seem to be important. The individualistic competitive spirit of the occidental culture, particularly of the Americans, leaves its mark on the success in tennis, athletics, in obstacle courses,

whereas the collectivism which is more present in the oriental culture (and the former socialist one) would be responsible for Russia's results in gymnastics (the former USSR) and China (Thomas, 2002). One can easily bring many counter-arguments based not only on many examples, but also on statistics. For example, the U.S. gymnastics team is in top 5 in the world, Russian athletes (and those who came from the former U.S.S.R.) obtained remarkable results many decades, one after the other. Hence, some general tendencies concerning the factors of the success in sport relying on countries may be observed, but the accurate explanation of different national performances supposes more like an approach based on context, a qualitative one, as it happens to other social domains of the development of the performance.

f) A qualitative approach in the exploration of tennis was made by A.M. Waser, a former tennis player at various tennis clubs in Strasbourg who became later lecturer at the university of Caen, working at the same time at the Center for Studies and Management of the Sport Innovation. Even if her paper – PhD thesis in sociology – is entitled “Sociology of tennis” (1995, Paris, Harmattan Publishing House), one has to do with a tight knitting of the sociological aspects with an authentic social psychology. By using the involved observation and the intensive interview, the author makes a comparison between four tennis clubs in Strasbourg, focusing on the socioeconomic status of the members of the club, on interpersonal relationships between players, on the connection of the members with the executive board, on the request and the offer for the players and on the mutual determination between club life and general social life of group's members. Also named “the genesis of a crisis”, the work follows the evolution of tennis in France, from the first clubs founded by the English aristocrats on the French territory, in the years 1870-1880, to 1990. The author proves the way that tennis turned from an amusement activity with the occasion of meetings between English and French aristocracy and bourgeoisie into a federal sport.

Until 1960, even if the French Tennis Federation existed already, the clubs still had the air of friendly meeting circles, people played tennis for pleasure and social relationships. As federations and clubs standardized the game (field and balls' dimensions, rules of game and so on), organized tennis became competition, hierarchy, industry increasingly. Club's prestige depended then not so much on tradition and social quality of the members, but on the value of the players. Their recruitment is no longer made, therefore, firstly on “family” bases and of socio-professional belonging, but depending on how good they play. This fact means a serious financial problem, richer clubs being able to buy more valuable players. One finishing stroke given to the traditional atmosphere tennis clubs, the loss of their social and cultural identity, was given by broadcasting the competitions. A.M. Waser considers that the homogenization of the tennis game by the federation, live broadcast and the broadcast of the game on replay by national or local channels were the factors which contributed to the French clubs' crisis in the early 90's of

the last century. The frustration that you are not the best or good enough in front of hundreds of thousands of people, as well as the “difficulty in finding partners”, “the lack of time” are the invoked reasons for the fact that the former affluence of enlisting in tennis clubs no longer exists.

Even if tennis clubs are not dead, their “spirit” is no longer what it seemed to be, a sports application loaded with multiple symbolic aptitudes, but it turned into a dry space of competition. The conclusions of the former tennis player of the 70’s have a nostalgic air, exposed, as a matter of fact, by representatives of many sports. But beyond this light air of sentimentalism, the paper describes in detail the process by which tennis became high performance tennis at the level of the clubs too, meaning extensively the connection of the symbolic connotation with the trading one.

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OPTIMAL APPROACHES OF PLANNING THE COMPETITIONS

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ABSTRACT. This article is about some of the most important factors which may guarantee the success of a tennis player. One of them refers to the importance of knowing when to stop for good or just for a longer or shorter period of time; this prevents the appearance of physical and psychical tiredness and feeling of too much. Here we have suggested some methods of relaxation like a trip to the mountains, to the seaside or the practicing of other sports. Another important factor refers to the importance of having the same sensations and pleasure of playing. The third important factor for success refers to the training sessions. Some can argue that this is the most important factor, but let's do not forget that all the tennis players train but only a few become champions. And the last factor mentioned here refers to the player's behavior during the tournaments, meaning not only on the tennis court but also outside it. The conclusion which can be draw is that , like in many other domains of activity, the most important is to know ourselves very well and our limits.

Keywords: *pleasure of playing, relaxation, physical and mental tiredness, self-knowledge, training sessions, tournaments.*

REZUMAT. Modalități optime de planificare a sezonului competițional în tenisul contemporan. Acest articol este despre unii dintre cei mai importanți factori care asigură succesul unui jucător de tenis. Unul dintre aceștia se referă la importanța cunoașterii momentului optim când să te oprești pentru o perioadă scurtă de timp; acest lucru împiedică apariția oboselii fizice și psihice și a sentimentului de saturație. De asemenea am sugerat câteva dintre metodele de relaxare cum ar fi excursii la munte sau la mare sau practicarea altor sporturi. Un alt factor important se referă la importanța păstrării plăcerii de a juca și a senzațiilor unice pe care ni le oferă practicarea tenisului de înaltă performanță. Al treilea factor important pentru succes se referă la sesiunile de antrenament. Unii ar putea argumenta că acesta reprezintă un factor primordial dar să nu uităm că toți jucătorii de tenis se antrenează dar numai câțiva ajung campioni. Și ultimul dar nu și cel din urmă factor se referă la comportamentul jucătorului nu numai pe terenul de tenis în timpul competițiilor ci și în afara lui. Concluzia care se poate desprinde este aceea că, asemenea multor domenii de activitate, este extrem de importantă auto cunoașterea și mai ales cunoașterea limitelor proprii.

Cuvinte cheie: *plăcere de a juca, relaxare, cunoașterea de sine, sezon competițional, competiție.*

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Any player, no matter of his level of performance, may experience a lack of focus during a tennis match. His thoughts are away and he feels incapable of focusing on the match or the ball. These situations are the result of the worries and concerns which haunt his mind but they can also be the result of the mental tiredness of the player, ultimately leading to a feeling of fed-up.

This state of spirit manifests itself through an attitude of passiveness or through a nervous breakdown. The phenomenon of fed-up is, unfortunately, widely spread in the today tennis world; the huge sums of money involved and the great number of tournaments at which the players take part for getting more and more ATP points makes the players to play more and rest less.

Unfortunately, only a few realize the negative effects of this state of fed-up upon the quality of their play. Most of the times they have tried to justify their failures appealing to technical and tactical causes.

It is also true that it is difficult to realize that it is about mental tiredness or the first signs of feeding-up. The one who learns to know himself better that will be able to stop when he feels it is necessary or to schedule better its tournaments. Many players unable to do this have missed the chance of becoming real champions.

TIME-OUT PERIODS

In order to regain the pleasure of playing, some players chose to interrupt their activity completely while others chose to continue playing not for losing the pleasure of sensations.

COMPLETE STOP

Many times, during a year, a tennis player may feel the need to stop; but it is advisable to be a stop of a week or two because in this case it is more difficult to regain the preciseness of the hit very quickly. The purpose of such a break is that of reconsidering the player's attitude towards the game; for better results it is advisable to cut all the possible connections with the tennis world. Instead mountain trips or the sea can be great alternatives. However, we do not have to forget the importance of getting in good shape; it is well known that good shape is got with difficulty and lost easily.

THE KEEPING OF THE SENSATIONS

Some players, even if they have chose to take a week or two break, prefer to continue hitting the ball. Most of the times they do this in a confrontation with players less trained the only purpose being that of not losing the pleasure of playing.

In this case the purpose of the break is that of relaxing, of forgetting about the pressure got during the training sessions or tournaments. Anyway a total relaxation is not advisable.

Each player have to know himself very well for knowing which method is better suited to him, when is the right time for him to stop and for how long. All these may vary from player to player.

To be a tennis player implies two periods of time, that of training and that of tournaments during which it is essential to avoid of getting bored or sick of playing.

The idea is to know how.

THE PERIODS OF TRAINING

The new tendency is to have short and rare periods of training due to the heavy schedule of the tournaments during a year.

The long periods of winter in which the physical training sessions were the most important along with the improvement of some technical details have gone. Instead there are some short periods of training before some competitions or in case of accidents.

If a player trains a lot for an important contest, it is almost impossible to get bored because he is already mentally connected to the tournament. But if the competition is going to have place at a distant date, the training sessions may become boring and lead to a passive attitude. "The degree of motivation" depends of the player's taste for competition.

Unfortunately, there is a category of players who are brilliant during the training sessions or during some informal matches, but who are not able to reach the same performance during official matches. These are the players who cannot stand the competition's pressure and often, they are not understood by the trainers, teachers or psychologists.

What remains it is the fact the long and repetitive training sessions are, most of the times, a source of saturation.

If the player trains at home, even 4 or 5 hours every day, the familial environment (parents, children, brothers, wives) gives him a feeling of comfort, calm and security and makes him forget about the hardships and difficulties of being professional tennis player.

Besides the family, to be in an agreeable environment is not always an easy task, especially in the situation in which "the false friends" buzz all around. That is why, most of the players socialize between them remaining in the same environment. But this environment does not represent the best way of exchanging ideas and that is why some of them are looking for establishing relationships with people from other environments.

The most dangerous situation for the young tennis players' crazy about this sport is to discover that there are many other things in life and that they can get satisfaction doing much more than hitting a ball and winning matches.

But those who become powerful very fast they got immediately all they want: fame, popularity, women, money and they do not show any interest in looking for other things.

THE TOURNAMENTS PERIODS

They also allow a lot of free time for the players.

Generally there is only one match per day, sometimes followed by a double match. There is only a short time of 30 minutes training sessions .

But there must be made a distinction between the 100th player , who often lose in the first or second tour, and Federer and Nadal who play a match every day. But even for them a working day means 4 or 5 working hours. Someone may argue that they have a lot of free time to do anything they want , but the reality is that universe of a professional tennis player during a competition is limited; he goes from the hotel to the tennis court and then back to the hotel.

That explains why a professional tennis player when he gets for the first time in a town is not interested to go sightseeing but is preoccupied by the next match. They are “on tour” so they have a state of spirit focused on the matches to be played.

In this case he needs to remain calm, he needs rest and peace and quiet and that is why he avoids, especially before the important matches, any additionally source of tiredness.

The short sessions of training and the practicing of some quiet and calm activities are the only activities done by a player before a match.

OCCUPATIONS DURING THE COMPETITIONS

During the competitions, the players who do not have a match, prefer to play cards, read books or watch their colleagues matches. Many have i-pods, i-phones, laptop's which are integrated part of players life. It is also true that due to the great amount of time spent in the plane or in the airports, music can also be a solution for relaxation and “ isolation” from the outside world. But the paradox is that music is one of the factors which stresses the individualistic side of the players especially in the tournaments, reducing in this way the contacts between players.

Returning to the extra-sportive preoccupations of the players during the tournaments, it is true that, once eliminated, the player has more free time. But playing almost every week, the eliminated player has to run to the next town and to start training for the next matches. In the situation when they lose, they want to get to his family as soon as possible, most of them hating to remain longer that necessary in the place they lose. However some of them choose to stay one or two more days spending the nights in different clubs from the town. Here they relax totally letting all the accumulated stress free.

What is certain is the fact that a player needs to take part to as many competitions as possible to become a stronger player and to progress. In the official matches a player learns the most.

So, the key for game's improvement is as much matches as possible accompanied by moral and physical freshness; otherwise the effects can be totally different. That is why so important to know themselves very well.

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THE IMPORTANCE OF TOURISM COURSES, SPORTIVE ORIENTATION AND SKI FOR KINESIOTHERAPY STUDENTS WHO ASPIRE TO BECOME MOUNTAIN RESCUERS

GANEA IOAN VIRGIL¹

ABSTRACT. The introduction of the tourism and sport orientation course, between the Kinesiotherapy Faculty's main or optional courses gives another chance for the young graduate to candidate/aspire to become a member of the mountain rescue team, a social alternative of professional development.

Keywords: ski, tourism, candidate, mountain rescue, social alternative of professional development

In order to back up the title of my paper, I have to mention that us, university teachers, have a big responsibility in training the students, but we also have to prepare them so they can blend socially and professionally.

The theoretical knowledge and practical skills acquired by the students have to be of real use allowing them to choose from a range of professional careers, based on the evolution of society.

We still sustain the specialization on a certain field of study, but we cannot deny the importance of interdisciplinary studies and their support in widening the career opportunities.

The curriculum reform caused a big reorganization of the Physical Education and Kinesiotherapy Faculty syllabuses, maintaining a common base for only 3 semesters. Because of this, physical education students lose the medical subjects that would have helped them in medical assistance and first aid, while kinesiotherapy students lose practical subjects like tourism and sportive orientation and applied swimming, courses that would have given them the chance to apply for Lifeguard and Mountain rescue jobs.

The strategic program of the Babes Bolyai University for 2007-2011, approved by the University's Senate in 25th July 2006 has the following objectives:

- „the need to replace „the reform” through addition of subjects with a reorganization of existing subjects and their order in the curriculum”;

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- „the need to concentrate on subjects that help forming the students, like the universities used as reference”;
- „the need to concentrate the curriculum on training the students”;
- „the need to establish which are the useful specializations for long term and to support those of them that to not attract enough students, with special programs”;
- „The curriculum council together with every faculty examine the connections between the different specializations, the work market and the European Union landmarks.”.

Starting from those objectives I consider that the Kinesiotherapy Faculty has inside the curriculum subjects that form skills with direct application in the Mountain Rescue department, like:

- functional anatomy and biomechanics
- general physiology
- hygiene and first aid
- massage, basic techniques
- kinesiotherapy in traumas
- physiology of physical effort
- invalids handling techniques
- medical massage, therapeutic instructions
- alpine skiing, theoretical and practical course.

The further we go from the urbane and rural areas, which have plenty first aid services (emergency rooms, medical offices, ambulance, SMURD), the lesser chances of survival has an injured man, and the chance of the „golden hour” is lost.

Mountain tourism has become a spread activity and people are going in more and more distant and remote areas looking for something new. Usually those groups of tourists (pupils, students or adults) are lead by mountain guides or physical education teachers, who because of the new curriculum do not study any more the applied medical subjects.

Mountain rescue services have the duty to cover the whole area of the touristic flow, but they cannot join all the groups that are on the mountain at a certain time. The kinesiotherapist can be a solution to the problem by increasing the number of people able to provide first aid in the mountains, but only if they like the mountain and long nature walks and if they are properly prepared for mountain recreation, orientation, wall climbing and cave-tourism. This complementary training can be done only through a direct and compulsory involvement of the students during the ski and tourism and sportive orientation courses, courses that are already in the curriculum of the Physical Education Faculty.

Skills acquired in the ski course:

- how to chose proper equipment based on age, skills and body development;
- knowledge of nutrition required by high altitude efforts;

- knowledge of body reactions during acclimation to high altitude efforts;
- knowledge of alpine skiing techniques required for movement on different types of snow (ice, powder, crust, etc);
- the ability to climb, break and safely stop on skies;
- the ability to descend and perform curves when working in a team, for the purpose of transportation of a injured person;
- knowledge of first aid techniques specific to alpine skiing (sprains, strains, fractures, frostbites);

Skills acquired in the tourism and sportive orientation course:

- how to chose the adequate equipment;
- how to set camp;
- the ability to travel on mountain paths in a sustain pace in 6-8 hours;
- how not to waste energy when traveling;
- how to orientate on the mountain with a compass or using natural landmarks;
- prevention of accidents in bad conditions (rain, fog, lightning, hail, thunder stroke, debris etc.);
- establishment of relations with the mountain rescue teams and with the service owners from the area.

All this skills will replenish the kinesiotherapy student's preparation and will give him the chance to try out as a mountain rescuer.

In order to get the students in touch with the specifics of the mountain rescuer, and to get them interested in this field of work, we, the teachers, have to form them in proper conditions. This requires the following steps:

1. The reintroduction of the course of tourism and sportive orientation in the Kinesiotherapy Faculty curriculum, as a compulsory or optional class.
2. The purchase of a first aid kit for practical applications.
3. The designation of the teachers that will coordinate the program.
4. The schedule of students in an even way on the different stages of preparation of the second year of study (the summer stage).
5. The schedule of students for the winter stage, on snow, under the coordination of a medical specialist.
6. Practical applications in collaboration with the Mountain Rescue service (winter stage).

All this stages will help the student to learn how to apply his knowledge in a different line of work, extending his professional options.

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SPORT SCIENCE – GENERAL REFERENCES

ZĂGREAN ELEONORA¹

ABSTRACT. We believe that the development in science and scientific research can shape its own laws and principles to substantiate an integrative name for it, which is the sport science.

The interrelation between science and scientific research boost to the philosophical level, the controversy between the subject and the object of historical research.

Scientific research is the most efficient way of objective knowledge of reality, of the phenomena in their essence. The main object of scientific research in sport is the phenomenon of sports performance and for this goal to achieve exceptional levels, there is need for comprehensive interdisciplinary approaches.

Keywords: *science, research, principles, interdisciplinary, sport science*

REZUMAT. ȘTIINȚA SPORTULUI – REPERE GENERALE. Considerăm că evoluția științei și a cercetării științifice poate contura legi proprii și principii veridice pentru fundamentarea unei denumiri integrative și anume cea de știința sportului.

Interrelația dintre știință și cercetarea științifică relansează, în plan filosofic, controversa istorică dintre subiectul și obiectul cercetării. Cercetarea științifică este modalitatea cea mai eficientă de cunoaștere obiectivă a realului, a fenomenelor în esența lor. Principalul obiect al cercetării științifice din domeniul sportului este fenomenul performanței sportive, iar pentru ca acest deziderat să atingă nivele de excepție, apare necesitatea unor abordări complexe, interdisciplinare.

Cuvinte cheie: *știință, cercetare, principii, interdisciplinaritate, știința sportului*

Introduction

Science is a systematic field of knowledge, one of the most important activities of people. It has been outlined since antiquity, preceding the emergence of scientific activity that is related to a particular type of knowledge: the scientific knowledge. Science is a system of knowledge and true facts governed by principles and laws.

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Sport and physical education are scientific fields in which principles and laws borrowed from other sciences are acting. For example, from mechanics, the principle of moderate-increasing dosage; from pedagogy, the law of conscious participation; or law of group effect from psychology etc.

If science is mixed up or deliberately equivalent with scientific research, the scientific disciplines (rather than scientific research) can be grouped multidisciplinary, transdisciplinary or, especially, interdisciplinary, in complex fields and about sport it might be said that it is able to capture both the complex areas of science and those that generated the earth sciences, natural sciences, sciences about the human being etc.

The name of *sport science* is, in our own view, a beneficial anticipation, especially since under its factual depth we can see its own principles and laws.

The relationship between science and scientific research

The scientific research is an approach of the researcher (of the logical subject), studying an omen or phenomenon (object logic), and belonging to the scientific domain. Therefore, the relationship between science and scientific research boost, to the philosophical level, the historical controversy between the subject and the object of research.

We believe that scientific research is one of the input entities of the science system. Through scientific research (but not only through it) the fund of knowledge and facts of a science is enriched, new laws and principles are discovered, theories and methods, devices and technologies are invented etc.

We must note that the benefit of sport science based on the research of the performance comes mainly from the exploitation of the sport as a business or as a social factor.

The interdisciplinary scientific research in sport science

The scientific research is the main way of objective knowledge of the reality, of the phenomena in their true essence.

The main object of the scientific research in sports is *the performance phenomenon* (of the athlete and his/her evolution).

The athletic performance depends on many factors. Most of these can be grouped around the athlete body, forming the group of biological and psychological sphere factors; others may form, for example, the group of technological factors (those referring to the sports materials, equipment and accessories), the environmental group, the opponent one and so on. The graph of these factors, through its flows of information entropy energy, offers a multitude of variations of performance predictability.

The interdisciplinary research becomes a necessity and not a trend. On the other hand, being a whole, the athlete body response to the exercise should be investigated fully and interdisciplinary accordingly with its main functions involved in the effort. In connection with the above example, A. Gagea proposes integro-correlation method for psycho-motor, neuro-endocrino-metabolic, neuro-muscular and psycho-social functions. This method has not any more as reference the "champion" model, but the biological one.

As a rule, an *interdisciplinary team* of research and scientific assistance in professional sports is composed of at least: a doctor, a biologist, a biochemist, a psychologist, a sports training methodologist and an computer specialist.

Interdisciplinary is a progressive solution that combines the advantages of *reliability* of transdisciplinary research with the *relevance* ones of multi-or pluridisciplinary research.

Principles of validation in sport science

Returning to sport science system, we noted that his output size, consisted of the rate of performance progress and the benefits of sport, depends both on the efficiency of the scientific research and the transfer function of the system, of the way of usage of the knowledge fund and true facts. In a based science, in addition to rules (conventional) of inevitable empiricism, the systematization of this fund is completed through principles (immutable relationships) and laws (relations that supports exceptions).

Their development seems to be currently possible, due to the tremendous amount of accumulated knowledge and scientific facts, and the effect will certainly improve the rate of progress and benefits of sport performance.

We appreciate that in time, the following ideas will be accepted as scientific principles and laws of sport science:

↳ Overcompensation effort principle. Accepting judicious training as a complex stimulus or stimulus complex, overcompensation becomes an appropriate response of the athlete body. On the basis of individual qualities, overcompensation tends to increase in the loop that follows stress-recovery cycle;

↳ The principle of social effects predictability of sports. Accepting the fact that interest in sports can be directed, its social effects become manageable, and based on the group behavior, they can become an instrument of influence and social influence.

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CRITICAL COMPOUND ASSESSMENT IN FOOTBALL REFEREE TRAINING

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ABSTRACT. Just like that of a football referee, nearly every field of activity has evolved towards improvement. Growing closely together with football, the domain of referee is meant to make up the object of a new field of activity and a process of continuous improvement. On a national and international level, in terms of interdisciplinary, refereeing represents a professional activity as it is described in the following.

Keywords: training, referee, speed, intervals

REZUMAT. Evaluarea componentă indispensabilă în pregătirea arbitrilor de fotbal. În decursul timpului aproape toate domeniile de activitate au evoluat spre perfecționare și cel al arbitrajului în fotbal de asemenea în strânsă simbioză cu fotbalul, menit să facă obiectul unui domeniu nou de activitate și perfecționare continuă. Arbitrajul la nivel național și internațional reprezintă o activitate profesionistă din punct de vedere al interdisciplinarității fapt prezentat în cele ce urmează.

Cuvinte cheie: antrenament, arbitru, viteză, intervale

A few decades ago a referee's job was fairly simple and easy. Being positioned somewhere in the centre of the field he would even hold an umbrella in case of unfavourable weather. Today, however, a referee's life is just as hard or active as that of a football player, being required to take part in all the phases of a game, defence and offence, a referee covers an average of 10 – 20 km, 5 – 6 for assistant referees. Being as close to the action as possible, anticipating possible conflicts amongst players is key, which means the referee is no longer a simple part of the scenery.

In the past two referees were making the decisions on the field while another referee wearing a gentleman's hat and carrying a stick was standing on the side-lines. As a consequence of the very different and increased rhythm of today's football game, at least 4 – 6 referees are needed to supervise every moment of a game, even more so the FIFA is considering to possibly make the additional two referees a definite part of future games.

The evolution of the game shows a growth of the spectacularity of it, a technical-tactical virtuosity, with a large area of creative expression and intelligence manifestation of the players, trends in support of which, the referees may have an important role.

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Fig. No 1.

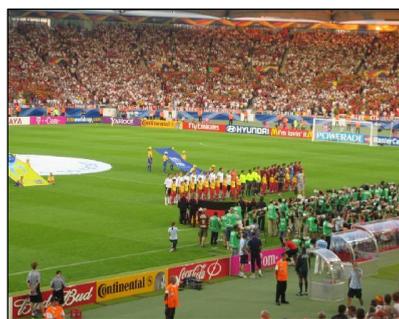


Fig. No 2.

The current game speed is much higher than previous periods, requesting the referee physically, putting him in a situation where he has to analyse decisions in fractions of a second, issues that can not be achieved without a complex training.

Therefore FIFA-UEFA wants and requires a specific physical training, based on the methods and means that are close to the football players, with trends taken from the athletic training with a carefully composed methodology.

The application of specific modern means and methods to optimize all factors of the training brought a result on covered distance during an official game.

Similarities and differences between players and referees has made over time many misinterpretations therefore I would like to present an average of travelled distances taken by them during an official game.

Related to the speed of the players I would like to give an example, on average, a professional player is moving with 8-8,5 m/sec, and a referee with 7 m/sec, if it crops up a counterattack in which the distance would be about 60m, the distance between the players and the referee increases approximate 14 m if they start in the same time, (but this situation almost never occurs, but if the distance would be the recommended one: 10-12 m, plus 14m more, the referee will have to make decisions from about 30 m) in conclusion every m matters when the referee needs to make a good decision.

Table no 1.

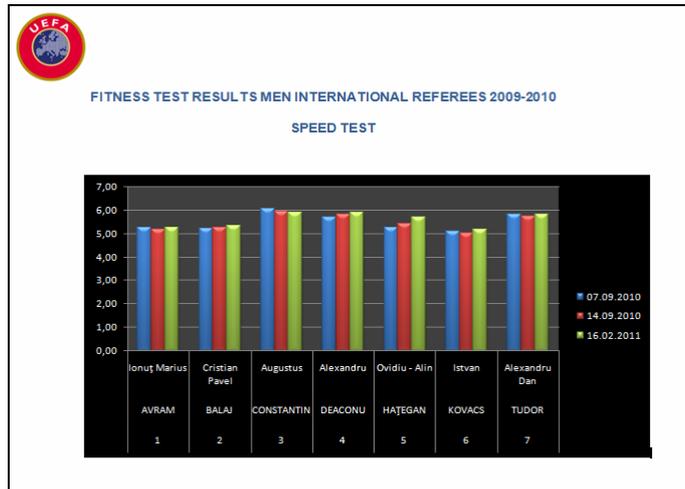
The average of travelled distances taken by players and referees

Distance (km)	Referees	Ass-Referees	Players
Total	11-13		10-14
Sprint	0,61	6-9	0,4
High Speed	1,6	0,3	0,7
Medium Speed	2,6	1,2	1,7
Low Speed	4,2	2,9	5,7
Backwards	1,3	1 - 2,4	0,2
Peek velocity (km/u)	24-28	21-24	>30

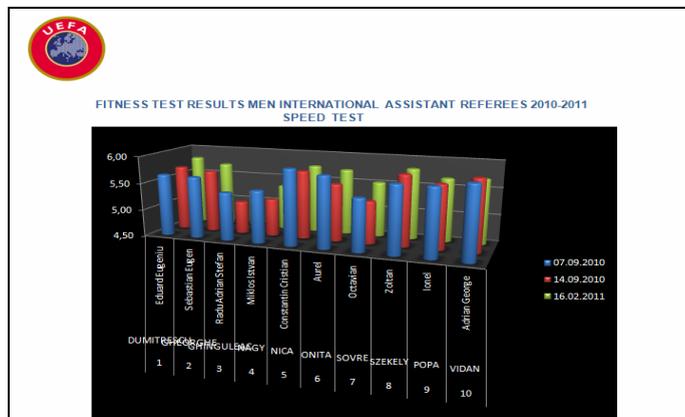
The evaluation of each referee is the primary component for each subject when we want to make radiograph of a constant training cycle.

After the specific evaluations obtained from implementing of specific methods and means, they have reached an improvement of the physical parameters as follows:

- Speed test- running a distance of 40m with 6 repetitions

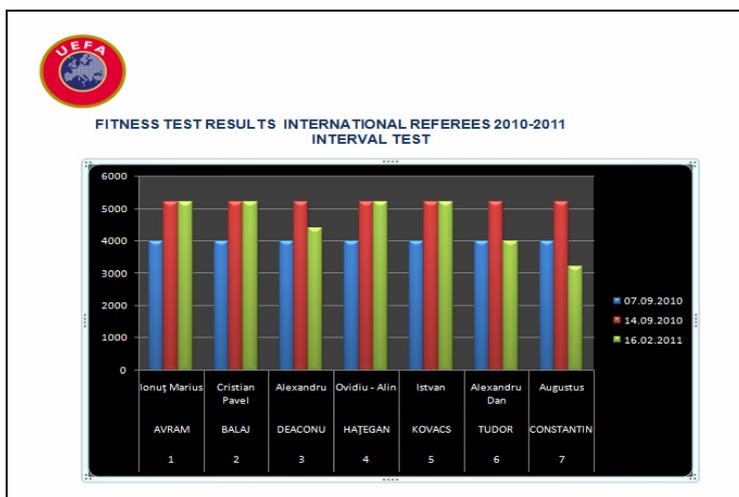


Graph no 1. Fitness Results men international referees 2009/2010 – speed test

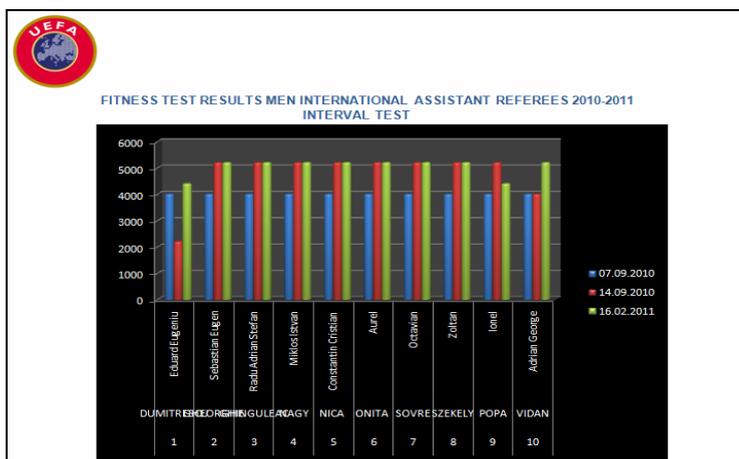


Graph no 2. Fitness Results men international referees 2010/2011 – speed test

Test of the intervals–was observed an improvement of the obtained values during the evaluation.



Graph no 3. Fitness Results International Referees 2009/2010 – interval test



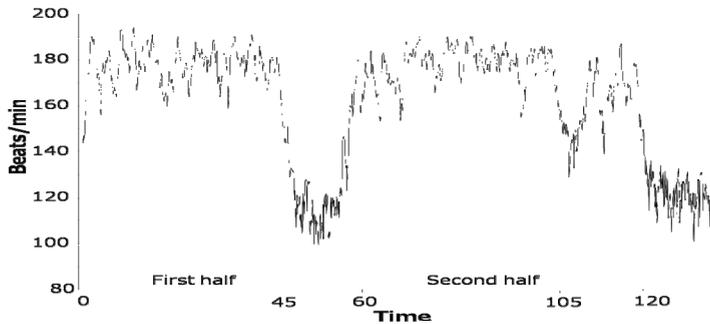
Graph no 4. Fitness Results International Referees 2010/2011 – interval test

For the evaluation of the referees and for the identification of the type of the effort during an official game we have used Polar watch, a barometer of the intensity of the effort depending on heart rate.

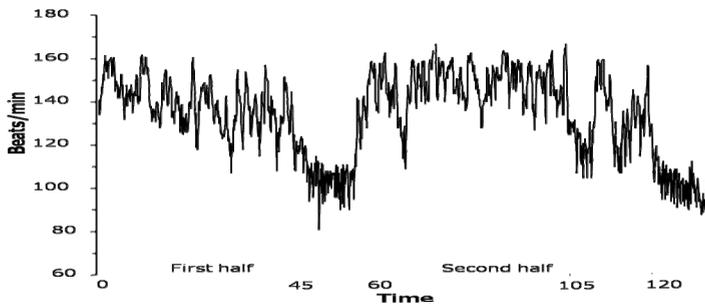
Why we use polar clock?

- for the identification of the heart rate which is directly proportional with the type of the effort
- to determine the intensity of the effort
- to determine the necessary time for to restore the body functions (break)

Evaluation of heart rate during a football game



Graph no 5. Referees hart rate evaluation



Graph no 6. Assitances referees hart rate evaluation

Conclusions

- The specific physical training is made gradually respecting the training factors volume-intensity
- In performing specific physical training many factors should be reviewed which should be taken to account (for example the age at the top referees which is between 35-45 years)
 - Is very important the restoring of the body before matches, because if the referee is physically or psychically tired, he can make big mistakes in management of the matches
 - The planification of the training sessions will be made according to the planification of the matches inside of the championship (competitional program)
 - Quantification of the training volume, intensity and density will be made with modern methods, not randomly (for example, the polar clock for the identification of the intensity of effort using heart rate)

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