

**Ss. Cyril and Methodius University in Skopje  
Faculty of Physical Education, Sport, and Health**



**1<sup>ST</sup> INTERNATIONAL SCIENTIFIC CONFERENCE  
RESEARCH IN PHYSICAL EDUCATION, SPORT, AND HEALTH**

**CONFERENCE PROCEEDINGS**

**Ohrid, 30-31. May 2014.**

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## DETERMINATION AND EVALUATION OF FLEXIBILITY AT 7 YEARS OLD CHILDREN

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### **Abstract:**

*Development, evaluation and estimation of motor abilities are one of the basic issues of PE teaching process and important component in determination of the efficiency of PE curricula. Flexibility as one of the determinants of human motor space and is highly related with motor effectiveness in children at early school age. In this paper, we shortly elaborated the theoretic and practical aspects of manifestation, evaluation and assessment of flexibility in 7 years old children and possibilities for its improvement through the PE teaching process. The research was realized on a sample of 123 seven - years old children, pupils in the second grade in five primary schools in Skopje, Republic of Macedonia. Flexibility was estimated applying following three tests Deep bend on bench, Both legs extension lying on back, Legs extended forward bend on floor. Tests characteristic were established using Crombah a u Spearman – Brown (SB) coefficients of reliability, Pearson coefficient of correlation and factor analysis for estimation of factor validity of the tests and Kaiser-Meyer-Olkin’s measure used for estimation of reliability and representativity. Results obtained in this survey point out on good metric characteristics of all applied tests. According the results, the best metric characteristics were obtained for the test both legs extension lying on back that is recommended as most suitable for estimation of flexibility of 7 years old children in situation of limited conditions for measurement.*

**Key words:** *flexibility, seven years old children, tests characteristics, norms, evaluation.*

### **Introduction**

Development, following and assessment of motor abilities in pre – schoolchildren and children in the early school period is one of the most important issues of research in kinesiology. The importance of this research issue is even bigger, considering the different manifestations of motor abilities in children, but also considering the fact that development of motor abilities is one of the main assignments of the PE teaching process. Motor abilities are also important for the process of sport training as one of the main criteria for selection in certain sport disciplines.

As a fundamental determinant of human motor space, motor abilities represent the essence of human motor movements and are in relation with development of human individual potentials (Jovanovski, 2013). From the aspect of PE teaching process, development of motor abilities is defined as one of the main goals of physical education (PE), defined in national curriculum for nine – years compulsory education in the Republic of Macedonia (Bureau for the development of education, 2007). From the aspect of PE teaching process, development of motor abilities is defined as one of the concrete goals in the segment named “movement” (Klincarov, 2007), or assignments that are recognized in pedagogy as educational assignments. Motor abilities are also highly related with the acquisition of different motor skills and habits (Matič, 1978). Therefore, changes in motor abilities are one of the criteria for creation of final grade from the subject physical and health education, criteria for following and evaluation of individual development and improvement of every child, as well as a manner for determination of efficiency of applied PE curriculum.

As a composed part of abilities that defines the human motor space, flexibility has an important role in the complex process of motor learning and determination of motor efficiency. Flexibility is commonly defined as ability to perform movements with large or maximal amplitudes (Zaciorski, 1975; Kurelić et al, 1975; Jovanovski, 1998); ability of the locomotor system to realize or perform movements with optimal amplitude (Perić, 2003). Flexibility as a complex motor characteristics exists primarily as a result of the actual muscle length and degree of mobility in the respective joints and it’s manifested through the amplitude of movement (Kukolj, 2006). The rang of motion exerted in certain joint is a measurement for



flexibility. Depending from the function of the active joint, the authors usually distinguish active and passive flexibility (Zaciorski, 1975, Jovanovski, 1998, Kukulj, 2006). In his work, Peric, D. (2003) speaks of two kinds of flexibility referred as *dynamic (phase)* flexibility which dominates in fast movements and occurs in most of sports and *static flexibility* which is characteristic for movements with high range of motion and are performed slowly.

Flexibility and it's manifestation are determined by the length and elasticity of the muscles, mobility of the joints and the anatomical structure of the skeleton system and ligaments. These indicate of the importance of flexibility for the complete human health. Therefore, according to The American College of Sports Medicine, flexibility along with cardiovascular fitness, muscular strength, muscular endurance and body composition are determined as components of health related fitness (Jurimae & Jurimae, 2010).

From the aspect of the structure of children's motor space, the existence of flexibility as an independent motor factor is determined in several surveys realized with children, conducted by Rajtmajer, 1993; Sabo, 2002; Lašan et al, 2005; Saiti, 2007; Vlahovič et al, 2007; Delaš et al, 2008; Popeska, 2009; 2011. In the researches realized by Rausavljevic, 1992; Bala, 2002; Bala et al, 2005 in which, according to the obtained results, the motor structure is defined with one general motor factor, flexibility is isolated as a part of the mechanism for regulation of muscle tone and synergistic regulation.

There are several sensitive periods in development of flexibility. The first period is the age of nine and ten years, together with the speed, after that the period between the age of 13-14 years complementary with the exercises for strength and power. The latest sensitive period for development of flexibility is the period between 15 and 16 years of age when flexibility is improved together with improvement of strength, speed and dynamic endurance. The results from applied tests for flexibility indicate that the best results the examiners have occurred in the period between six and nine years. This ability declines with increase of children's age. Observation of children shows declining growth of flexibility with age, which indicates that children are naturally more flexible when they are younger.

According to Haywood & Getchell (2004), flexibility declines if we do not train it, even in childhood. According to the results from the research realized by Krahenbuhl & Martin, 1977 (referred to Haywood & Getchell, 2004), flexibility both for boys and girls declines mostly in the period between 10 and 14 years. Results from other researchers have reported decline of flexibility in children at the age between seven and eight, or in the second grade of primary school. It's considered that the decreasing of flexibility is a result of growth of the bones in length, process that is followed with increase of length of the muscles. Better flexibility is noted for the girls compared with boys, but it's considered that these differences are result of greater acceptance of exercises for improvement of flexibility from the girls, not as a result of sex differences (Haywood & Getchell, 2004). Better results at flexibility tests obtained for girls, compared with boys obtained in the surveys conducted by Bala, 2003; Lašan et al, 2005; Pejčič & Malacko, 2005. The flexibility in boys' declines after the 10 years of age, while in the girls, this process occurs two years later, at the age of 12. The results from the tests for flexibility are related with the strength of the abdominal muscles and other morphologic characteristics (Pistotnik, 2003), mainly with the changes of skeletal dimensionality (Rausavljevic, 1992).

All previously explained notes, emphasize that motor abilities, including the flexibility are conditioned by children's age. In children, the manifestation and development of motor abilities is different in every certain age period. Therefore, findings about children's motor abilities in every age period, as well as specific manners of their manifestation and development and possibilities for their following and estimation, are the key issues for the PE teaching process. All these issues were foundation for this paper, which aim is to suggest motor tests with good metric characteristics used for estimation of flexibility at 7 years old children, as well as to propose normative for evaluation of children's achievements. These normative could be used as an objective manner for determination of children's achievements in order to follow their individual improvement.

## Material & methods

The research was conducted as a part of larger study (Popeska, 2011) realized on a sample of 123 examiners, 7 years old male children, pupils in second grade in five primary schools in Skopje, Republic of Macedonia. Flexibility was determined using following three tests: Deep bend on bench (FLDPK), Both legs extension lying on bag (FLRLG) and Legs extended forward bend on floor (FLPRP). These tests are primarily designed for use with older examiners - adolescents and students (Kurelič et al, 1975;

Metikoš et al, 1989). Afterward, they were modified and adapted in order to be suitable for use with pre – school and school children. The adaptation of the tests Deep bend on bench (FLDPK) was made by Dukovski (1984), while the other two tests: Both legs extension lying on bag (FLRLG) and Legs extended forward bend on floor (FLPRP) were modified by Popeska (2009). Recommendations of the authors that previously applied these tests were implemented in the measurement procedure. All used tests were applied as three – item tests, realized with three repetitions and are measured in cm. Also the number of repetitions is a small number considering the main goal – determination of metric characteristic, this number is accepted as methodologically correct, considering the age and possibilities of the examiners. Small number of repetitions of motor tests is also confirmed, approved and recommended in other studies realized with children (Bala 1981, Pisot & Planinsec, 2005, Jurimae & Jurimae, 2010).

Tests characteristics: discriminativity (sensitivity), asymmetric, homogeneity, reliability, validity and representativity are fortified for all three applied tests. Discriminativity, asymmetric and homogeneity were determined using the measures for tendency and dispersion, while reliability, validity and representativity were estimated based of Cronbach  $\alpha$  and Spearman – Brown's (SB) coefficients of reliability, Pearson's coefficient of correlation and factor analysis for determination of validity of the tests. The Kaiser-Meyer-Olkin's measure was used for determination of reliability and representativity of the tests. Normative for children's achievements in motor tests are defined using percentile classes and percentile values for 1, 3, 5, 10, 20, 25, 30, 40, 50, 60, 70, 75, 80, 90, 95, 97 and 99 percentile. The results in the final table for estimation of children's motor achievements are obtained with reduction of percentile distribution in 5 percentile classes defined as: above 95 percentile – excellent achievement; from 75 to 95 percentile – achievement above average; from 26 to 75 percentile – average achievement; from 5 to 25 percentile – below average achievement and under 5 percentile – very bad achievement

## Results

Basic descriptive statistics parameters for all three applied tests for estimation of flexibility at 7 years old are presented in Table 1.

*Table 1: Basic measures of central tendency, dispersion and normality of distribution of motor tests used for estimation of speed at 7 years old children (second grade)*

	Mean	SD	Sx	KV	MIN	MAX	Range	skew	kurt	KS	P
FLDPK1	42,31	7,15	0,64	16,90	20	59	39	-0,51	0,64	0,13	p < ,05
FLDPK2	41,28	6,50	0,59	15,74	24	56	32	-0,10	-0,06	0,08	p > ,20
FLDPK3	40,59	6,49	0,59	15,98	26	57	31	0,22	-0,23	0,11	p < ,10
FLRLG1	89,48	17,04	1,54	19,05	55	130	75	-0,15	-0,36	0,11	p < ,10
FLRLG2	92,96	17,68	1,59	19,01	50	130	80	-0,39	-0,22	0,11	p < ,15
FLRLG3	94,59	19,79	1,78	20,92	50	145	95	-0,34	-0,20	0,13	p < ,05
FLPRP1	35,21	10,34	0,93	29,37	15	60	45	0,21	-0,43	0,07	p > ,20
FLPRP2	36,89	10,15	0,91	27,50	15	60	45	0,13	-0,37	0,08	p > ,20
FLPRP3	38,48	10,37	0,93	26,94	15	65	50	0,27	-0,10	0,07	p > ,20

Results presented in Tables 2, 3 and 4 represent the obtained values from applied coefficients of reliability and representativity, as well as the values for internal and factorial validity for every certain test applied for estimation of flexibility.

**Table (2).** Deep bend on bench (FLDPK), reliability, validity and representativity obtained at 7 years old children

ajtems	r and SMC			H 1	h <sup>2</sup>
FLDPK 1	(.80)			.94	.87
FLDPK 2	.89	(.91)		.98	.96
FLDPK 3	.79	.91	(.83)	.94	.89
Cronbach's $\alpha$	.95			Lambda	2,72
SB	.95			%	90,79
KMO	.68				

**Table (3).** Both legs extension lying on bag (FLRLG): reliability, validity and representativity obtained at 7 years old children

Ajtems	r and SMC			H 1	h <sup>2</sup>
FLRLG 1	(.81)			.95	.91
FLRLG 2	.90	(.91)		.98	.96
FLRLG 3	.87	.94	(.89)	.97	.94
Cronbach's $\alpha$	.96			Lambda	2,81
SB	.97			%	93,63
KMO	.76				

**Table (4).** Legs extended forward bend on floor (FLPRP): reliability, validity and representativity obtained at 7 years old children

ajtems	r and SMC			H 1	h <sup>2</sup>
FLPRP 1	(.89)			.97	.95
FLPRP 2	.94	(.93)		.98	.97
FLPRP 3	.92	.95	(.91)	.98	.96
Cronbach's $\alpha$	.98			Lambda	2,87
SB	.98			%	95,67
KMO	.78				

**Table (5).** Normative for determination of children's achievements at the tests applied for evaluation of flexibility

		Deep bend on bench FLDPK	Legs extended forward bend on floor FLPRP
		7 years	7 years
1	Bad achievement	Up to 30 (sm)	Up to 20 (sm)
2	Under average achievement	31 – 37	21 – 29
3	Average achievement	38 – 46	30 – 43
4	Above average achievement	46 – 52	43 – 55
5	Excellent achievement	Above 52	Above 55

### Discussion

According to the values of the descriptive statistics parameters, presented in Table 1, we could conclude that results from three applied tests, used for estimation of flexibility at seven years old children are normally distributed. Analysis of average values of results from applied tests point out on a progressive improvement of the results from first to the third repetition at following two tests: both legs extension lying on bag (FLRLG) and legs extended forward bend on floor (FLPRP). For the test deep bend on bench (FLDPK), the best average results is obtained in the first measurement and in the following repetitions, average results at the tests decrease continuously. According to the values of the tests for discriminativity (the relation of  $x$  and  $SD$ , 3:1) and asymmetry (skwenes), applied tests are sensitive and easy to perform, except the test Legs extended forward bend on floor (FLPRP). According to the results, for the seven years old children, this test is hard to perform. Results from all three applied tests are homogeneous.

Results obtained for the coefficients of reliability and representativity as well as the results for test validity are presented in Tables 2,3 and 4. Values obtained for Spirman – Brown and Cronach's  $\alpha$  coefficients of reliability (from .95 to .98) obtained from three movement tasks used for estimation of flexibility, point out on very high reliability of all applied tests. Compared between three tests, the highest

coefficient of reliability (.98) is obtained for the tests legs extended forward bend on floor (FLPRP).

Validity of the tests is determined using factor analysis. Using Hotelling procedure of results from the three repetitions of all three tests used for estimation of flexibility, one significant root for every factor is isolated. The isolated factor explains the variability of the applied systems with values from 90.79% to 95.67%. The variability of the test deep bend on bench (FLDPK) is explained with 90,76%, the variability of the test both legs extension lying on bag (FLRLG) is explained with 93,63%, while the test legs extended forward bend on floor (FLPRP) is explained with high 95, 67%. The high explained variability of the tests, points out that the results obtained from the three repetitions on the same test are not significantly different. This is confirmed with high projections of the isolated factor for each test (from .94 to .98). The high factor validity obtained for applied tests for estimation of flexibility is confirmed with significant coefficients of correlation (from .75 to .91) between results of each repetition of every single test. High values for KMO index from .68 to .78 obtained at three applied tests for flexibility, point out on good representativity of the tests.

Results obtained for of coefficients of correlation, reliability, validity and representativity (table 2, 3 and 4) suggest that all three movement tasks used for estimation of flexibility of seven years old children, have good metric characteristics. We recommend these tests for further use with seven years old children. In situations of limited conditions for realization of measurements or in situation where short battery of tests is needed, as a test with best metric characteristics from these group of tests, we recommend the test legs extended forward bend on floor (FLPRP).

## Conclusions

As a composed part of abilities that defines the human motor space, flexibility has an important role in the complex process of motor learning and determination of motor efficiency or motor behavior at children. Flexibility is one of the components for evaluation of health related fitness. This relation is result of conditionality of flexibility by the structure of skeletal and muscle system and their characteristics. Relations between flexibility and other motor abilities, as well as the impact of regular physical activity of maintaining of flexibility are one of the main reasons why this motor ability should be improved and developed during PE teaching process using PE contents. Therefore, findings about manifestation of flexibility in every certain period of age in children, possibilities for its improvement, as well as the standardized procedures for its estimation and evaluation in children, are especially important for PE teaching process and kinesiology in general.

Therefore, the aim of this paper is to suggest a motor tests with good metric characteristics for evaluation of flexibility at 7 years old children as well as to propose a normative for evaluation of children's achievements and individual progress. The research was realized on a sample of 123 examiners, 7 years old male children, pupils in second grade in five primary schools in Skopje, Republic of Macedonia. Flexibility in children was assessed using following three tests: Deep bend on bench (FLDPK), Both legs extension lying on bag (FLRLG) and Legs extended forward bend on floor (FLPRP). Tests characteristics: discriminativity (sensitivity), asymmetric, homogeneity, reliability, validity and representativity are fortified for all three used tests. Obtained results point out on highly reliable tests, with high validity and good representativity. According the results, all three tests have good metric characteristics and we recommend them for further use with 7 years old children. For all recommended tests, we suggest norms for evaluation and assessment of children's achievements and individual improvement in flexibility. According the tests results, in situations of limited research conditions or when short battery of tests is needed, we recommend the tests Legs extended forward bend on floor (FLPRP) as a test with best metric characteristics for estimation of flexibility, proper for use with 7 years old children. Beyond the good metric characteristics, this test is also economic from the aspect of time and conditions for its realization. This finding is also confirmed by the authors Ikeda, T & Aoyagi, O. (2008) in their studies oriented toward designing of new motor tests for pre – school children and children in the early school period. They have also confirmed that flexibility tests realized activating the trunk muscles, such as tests used in our research, have higher reliability, validity and are more practice than other tests.

Speaking about the evaluation of motor ability and realization of motor measurements, researchers that work on this issue determined certain difficulties that are also confirmed in our research. These difficulties mostly refers to age characteristics of the children that are manifested as reduced



concentration, attention and short term focus, disorientation from the goal, lack of motivation, emotional instability as well as understanding of testing as a game, not as an assignment (Jürimäe & Jürimäe, 2001; Gallahue, 1987; Rajmayer, 1997). Related to this and in order to overcome these difficulties, certain procedures like motivation, encouraging, demonstration and previous tries of the motor tasks, which are unacceptable in work with adults, to be justified and recommended in work with children (Bala, 1999; Jürimäe & Jürimäe, 2001; Ikeda & Aoyagi, 2007, Rajtamer, 1997; Popeska, 2011). Therefore, in researches from this type as well as in everyday work with children, knowledge and appreciations of characteristics of children emotional and psychological development as well as their influence on children's motor abilities are essential. This means respect of holistic approach in work with children.

### References:

- Age group development program for mens & womens artistic gymnastics*, Phase three, Federation Internationale De Gymnastique, FIG
- Bala, G. (1981). *Struktura i razvoj morfoloških i motoričkih dimenzija dece SAP Vojvodine*. Novi Sad: Fakultet fizičke kulture.
- Bala, G. (1986). *Logičke osnove metoda za analizu podataka iz istraživanja u fizičkoj kulturi*, Novi Sad: Fakultet fizičke kulture.
- Bala, G. (1999) Some problems and suggestions in measuring motor behaviour of pre – school children. *Kinesiologija Slovenica*, 5 (1-2), 5 -10.
- Bala, G. (2002). Strukturalne razlike motoričkih sposobnosti dečaka i devojčica u predškolskom uzrastu. *Pedagoška stvarnost*, XLVIII, 9 – 10, 744 – 751, Novi Sad.
- Bala, G. (2003). Quantitative differences in motor abilities of pre – school boys and girls. *Kinesiologija Slovenica*, 9, (2), 5 – 16.
- Bala, G., Stojanović, V. M. i Stojanović, M. (2007) *Merenje i definisanje motoričkih sposobnosti dece*. Novi Sad: Fakultet sporta i fizičkog vaspitanja.
- Bureau for the development of education (2007). *Physical education curriculum from first to third grade in nine year primary education*, Skopje: Macedonian ministry of education.
- Delas, S., Miletic, A. i Miletic, D. (2008) Uticaj faktora motorickih sposobnosti na izvođenje bazicnih motorickih znanja- razlike između devojčica i dečaka. *Facta Universitatis. Physical Education and sport*. vol.6. No 1. pp 31-39.
- Dukovski, S. (1984) *Struktura i razvoj morfoloških i biomotoričkih dimenzija dece predškolskog uzrasta u Skoplju*, Doktorska disertacija, Beograd: Fakultet za fizičko vaspitanje. 10. Gajic, M. (1985) *Osnovi motorike coveka*, Novi Sad: OOUR Institut fizicke kulture.
- Haywood, K., & Getchell, N. (2004) *Life span motor development*. Champaign: IL. Human Kinetics.
- Hoffman, J. (2006) *Norms for fitness, performance and health*. Champaign: IL. Human Kinetics.
- Ikeda, T. & Aoyagi, O. (2007) Relationships between test characteristics and movement patterns, physical fitness, and measurement characteristics: suggestions for developing new test items for 2 – 6- year – old children. *Human performance Measurement*, Vol. 5, 9 – 22.
- Јовановски, Ј. (1998) *Практикум по основи на психомоторика*, Скопје: Факултет за физичка култура.
- Јовановски, Ј (2013) *Психомоторика*, Универзитет „Св.Кирил и Методиј“, Факултет за Физичка култура: Скопје
- Jürimäe, T. & Jürimäe, J. (2001) *Growth, physical activity and motor development in prepubertal children*. New York: CRC Press.
- Lasan, M., Pažanin, R., Pejić, A. & Katić, R. (2005) The mechanisms of morphological – motor functioning in male primary school first – to – fourth – graders. *Kinesiologija Slovenica*. 11, (2), 25 – 32.
- Klincarov, I. (2007). The role of physical education teacher education quality in school physical education process in Republic of Macedonia. *4th FIEP European Congress*, Bratislava, Slovakia: Comenius University, Faculty of Physical education and sport, Slovak Scientific Society for Physical education, Federation Internationale d' Education Physique (FIEP)
- Kukolj.M. (2006) *Antropomotorika*. Beograd: Fakultet sporta i fizickog vospitanja
- Kurelic, N., Momirovic, K., Stojanovic, M., Sturm J., Radoevic, H. i Viskic – Stalec, N. (1975) *Struktura i razvoj morfoloških i motorickih dimenzija omladine*, Beograd: Institut za naucna istrazivanja Fakulteta za fizicko vaspitanje.
- Malina, R., Bouchard, C. & Bar – Or, O. (2004) *Growth, Maturation and Physical Activity* (Second Edition). Champaign: Human Kinetic, Illinois.
- Matić, M. (1978) *Čas telesnog vežbanja, Budućnost, Zrenjanin*
- Perić, D. (1991). *Komparativna analiza metodoloških sistema eksplikacije biomotoričkog statusa dece predškolskog uzrasta*. Doktorska disertacija, Beograd: Fakultet fizičke kulture Univerziteta u Beogradu.
- Peric. D. (2003) *Antropomotorika, osnovi sportske lokomocije*. Beograd: Ideaprint.

- Pejčić, A. & Malacko, J. (2005) The ontogenetic development of morphological characteristics and motor abilities of boys and girls in early elementary school. *Kinesiologija Slovenica*. 11, (2), 42 – 55.
- Pistotnik, B (2005) *Kineziologija*, 9, 2003 str 47 - 57
- Pišot, R. & Planinšec, J. (2005) *Struktura motorike v zgodnjem otroštvu*, Univerzitetna in Primorska, Koper: Institut za kineziološke raziskave.
- Попеска, Б (2009) *Утврдување и компарирање на латентната структура на моторичкиот простор кај машки деца на 6 и 7 годишна возраст*. Магистерски труд. Скопје: Факултет за физичка култура.
- Попеска, Б (2011) *Развој на морфолошките и моторичките димензии кај деца од машки пол на 6 и 7 годишна возраст*. Докторска дисертација. Скопје: Факултет за физичка култура.
- Rajtmjer, D., Proje, S. & Vute, R. (1989) Informacijski sistem za spremljanje in vrednotenje motoričnih sposobnosti predškolskih otrok. *Športna vzgoja*. 37, (1-2), 9 – 12.
- Rajtmajer, D. (1993) Komparativna analiza psihomotorične strukture dečkov i deklie, starih 5 – 5,5 let. *Šport*. 41, (1-2), 36 – 40.
- Rajtmajer, D., (1997) Comparative analysis of the structure of motor abilities of younger children, In M. Pavlovič (Ed). *Proceedings of the III International symposium Sport of the young*. Bled, Slovenia (216 - 221). Ljubljana: University of Ljubljana. Faculty of Sport.
- Rausavljević, N. (1992) *Relacije izmedju morfoloskih karakteristika i motorickih sposobnosti učenika i učenica prvih razreda osnovnih škola u Splitu*, Doktorska disertacija, Skopje: Fakultet za fizička kultura.
- Сабо, Е. (2002) Структура моторичког простора и разлике у моторичким способностима дечака предшколског узраста при упису у основну школу, *Физичка култура*, Београд, 56, (1-4). 10 – 17.
- Саити, Б. (2007) *Оценување на моторичките способности како прилог на опитата оцена по физичко и здравствено образование за учениците од I – IV одделение во Р.Македонија*. Докторска дисертација, Скопје: Факултет за физичка култура.
- Зациорски, М. (1975) *Физичка својства спортиста*, Београд: НИП "Партизан".
- Vlahovic, L., Bavcevic, T. & Katic, R. (2007) Biomotor Development in 1992 and 2002 Samples of seven – Year – Old Children. *Collegium Antropologicum* 31. (4). 987-992

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