Направления:

1.Физическото възпитание, спортът и рекреацията в образователната система

2.Рекреация, анимация и спорт в свободното време – превенция за здраве

3.Теория и методика на физическото възпитание и спорта

Програма:

08.11.2013 г. (петък)

12.00 ч.—14.00 ч. – Регистрация на участниците;
14.00 ч.—15.00 ч. – Откриване на конференцията, пленарно заседание;
15.00 ч.—16,30 ч. – Заседание на първо направление;
17,00 ч.—18,30 ч. – Кръгла маса;
19.00 ч.—Коктейл.

09.11.2013 г. (събота)

09.00 ч.—10.30 ч. – Заседание на второ направление;
10.30 ч.—11.00 ч. – Кафе-пауза;
11.00 ч.—12.30 ч. – Заседание на трето направление;
13.00 ч.—14.00 ч. – Обедна почивка;
14.30 ч.—15.30 ч. – Заключително заседание

Забележка:
Допускат се промени, съгласувани и решени от участниците в Конференцията.

SOFIA UNIVERSITY "St. Kliment Ohridski"

DEPARTMENT OF SPORT

Sofia 1504, Bulgaria, 15 Tzar Osvoboditel Blvd.

Tel. (+359-2) 9442749,9308 /435, 703
Fax (+359-2) 943-38-18
e-mail: conference@sport.uni-sofia.bg

РЕКТОРАТ
стая 120, 209А
Тел.: 02 9442749
02 9308 (435, 703),
Факс: 02 9433818
E-mail:
secretary@sport.uni-sofia.bg
Web:
http://www.uni-sofia.bg/Sport

СОФИЙСКИ УНИВЕРСИТЕТ "СВ. КЛ. ОХРИДСКИ"

ДЕПАРТАМЕНТ ПО СПОРТ

България, София 1504,
Бул. "Цар Освободител" 15
Тел. (+359-2) 9442749,9308 в.435, 703
Факс (+359-2) 943-38-18
e-mail: conference@sport.uni-sofia.bg

Място на провеждане:
Ректората на Университета
Зала № 2

Срокове

Потвърждаване участие до	30.06.2013 г.
Изпращане на доклада до	31.08.2013 г.
Потвърждаващ отговор от организационния комитет	15.09.2013 г.
Заплащане на таксата до	07.10.2013 г.

Софийският университет и Департаментът по спорт

в чест на **125** годишнината на Алма Матер

Ви канят да участвате в

Международна научна конференция

на
08-09.11.2013 г.
София
на тема:
Съвременни тенденции на физическото възпитание и спорта

Кръгла маса:

Мястото на спорта в университетското образование

СЪВРЕМЕННИ ТЕНДЕНЦИИ НА ФИЗИЧЕСКОТО ВЪЗПИТАНИЕ И СПОРТА

Организационен комитет:

доц. д-р Анжелина Янева
Зам.-ректор на СУ
проф. дпн Емилия Рангелова
доц. д-р Емил Прокопов
Зам.-кмет СО
Зам.-министър на образованието
Зам.-министър на спорта

Секретар:

гл. ас. д-р Боряна Туманова

Редакционна колегия

доц. д-р Анжелина Янева, гл. ас. д-р Антон Хиджов, гл. ас. д-р Боряна Туманова, гл. ас. д-р Ирен Пелтекова, гл. ас. д-р Евгени Йорданов, гл. ас. д-р Георги Игнатов, ас. д-р Костадин Костов, гл. ас. Елисавета Михайлова

Технически сътрудници:

гл. ас. Иванка Костова, ас. Валерия Луканова, ас. Тихомир Димитров, Фани Благоева, Станислава Стоименова, Ивайло Прокопов

Коректор:

Фани Благоева

Съставител:

доц. д-р Анжелина Янева

Издателство:

Университетско издателство и печатница "Св. Кл. Охридски"

Финансиране:

Конференцията се осъществява с помощта на научен проект за частично финансиране от бюджета на СУ за 2013 г.

ИЗИСКВАНИЯ

ЗА ОФОРМЯНЕ И ПУБЛИКУВАНЕ НА МАТЕРИАЛИТЕ

Предложените статии трябва да са оригинални и непубликувани в други издания, да се предадат на електронен носител.

Работни езици: български, руски и английски;

Статиите да са от 3 до 10 страници и да бъдат оформени по следния начин:

Текст: Редактор Word 2000 или по-висока версия;

Оформление: Формат А4, Portrait; Times New Roman, Size 12; Regular, Justify; междуредово пространство single; без сричкопренасяне. Полета: Top – 2.5 cm, Left – 2.5 cm, Bottom – 2.0 cm, Right – 2.0 cm, Character spacing—Normal;

Заглавие на български език Times New Roman, Size 12, Bold, All Caps, Alignment (Align) Justified;

Автор/и – след един празен ред, Times New Roman, Size 12, Bold, All Caps, Line spacing – 1,5, Align Justified;

Заглавието и имената на авторите на английски език се разполагат през 2 празни реда: собствено и фамилно име на авторите, следвано от заглавието – Times New Roman, Size 12, All Caps, Line spacing – 1,5, Align Justified;

Анотацията на английски език: през 1 празен ред, в обем до 12 реда, Times New Roman, Size 10, Regular, First Line Indent – 1,5, Line spacing – 1,5, Align Justified;

Ключови думи—Key Words следват през 1 празен ред Times New Roman, Italic, ключовите думи са Times New Roman, Size 10, Regular, First Line Indent – 1,5, Line spacing – 1,5, Align Justified;

Основен текст: Times New Roman; Size 12, First Line Indent – 1,5, Line spacing – 1,5, Align Justified.

Литература: Times New Roman; Size 12, Line spacing – 1,5, Align Justified.

Данни за автора (авторите) - през един празен ред, *месторабота, длъжност, научна степен, контакти за връзка* — Times New Roman, Size 12, *Italic,* Align Right.

Таблици и фигури: Прилагат се в текста и на отделни файлове в цвят чернобял, патерн или други различими цветове за печат в черно-бялата гама. Диаграмите задължително се представят на Excel. Схемите се изчертават на Smart Draw, Corel Draw 10 или по-висока версия. Номерът и текстът на таблицата се позиционират над нея, а на фигурата – под. Изписват се по следния начин: Font - Times New Roman; Size 12; No effects; Paragraph Alignment: Center. Таблиците и фигурите се отбелязват в текста с малки скоби (Табл. 2).

Литература: Библиографията трябва да съдържа само автори, цитирани в текста. Посочва се съгласно БДС, като в текста цитирането се указва с цифри в квадратни скоби [2], които съответстват на поредния им номер в библиографската справка. Когато се цитират имена на автори, след името се посочва датата на издаване в малки скоби (Богданов, 2008) или Богданов (2008). Авторите се подреждат и номерират по азбучен ред (по фамилното име на първия автор) първо на кирилица, след това на латиница, като се спазва следната последователност:

Статии — име на авторите, заглавие на материала, наименование на списанието, том, номер на броя, година на отпечатване, страници.

Книга—имена на авторите, заглавие на книгата, издателство, място на издаване, година на издаване.

Финансови условия:

Такса за участие:
60 лв. за първи доклад,
40 лв. за докторанти—редовно обучение,
20 лв. за студенти, незрящи и за всеки следващ доклад;
Пълната такса се заплаща до **07.10.2013 г.** по сметка:
БЪЛГАРСКА НАРОДНА БАНКА - Централно управление
Банкова сметка**:**
BG52 BNBG 9661 3100 1743 01,
BIC CODE: **BNBGBGSD**
Титуляр: СУ „Св. Климент Охридски",
за конференцията на Департамента по спорт
Вносител**: трите имена на участника**
Таксата за участие включва:
Сборник с доклади и материали от конференцията;
Участие в работните заседания;
Кафе-паузи и коктейл на 8 ноември 2013

CHARACTERISTICS OF MOTOR TESTS FOR EVALUATION OF SPEED USED AT 7 YEARS OLD CHILDREN

BILJANA POPESKA

ORCE MITEVSKI

JOVAN JOVANOVSKI

SNEZANA JOVANOVA – MITKOVSKA

ХАРАКТЕРИСТИКИ НА МООТРИЧКИТЕ ТЕСТОВЕ ЗА ОЦЕНКА НА СКОРОСТТА ПРИЛОЖЕНИ ПРИ ДЕЦА ДО 7 ГОДИШНА ВЪЗРАСТ

БИЛЯНА ПОПЕСКА

ОРЦЕ МИТЕВСКИ

JОВАН JОВАНОВСКИ

СНЕЖАНА JОВАНОВА – МИТКОВСКА

Abstract

Changes in motor abilities are one of the criteria for creation of final appraisal for PE as well as criteria for following of individual progress and improvement of every child. Therefore, motor tests with significant metric characteristics are the most objective manner for estimation of the effects from the teaching process. This aim of this paper is to determine the metric characteristics as well as norms for valuation of achievements in three tests used for estimation of speed at 7 years old children. The research was realized at sample of 123 examiners, second grade pupils in in five primary schools in Skopje, Republic of Macedonia. Following three variables for estimation of speed were used: 10 m running from flying start (BT10LS), running 4x10m (BT4x10) and cries - cross running 4x5м (BTZMT). Results obtained in this research indicate to good metric characteristics and are recommended for further use. Best characteristics are obtained for the test cries - cross running 4x5м (BTZMT) which is recommended for use in shorter battery of tests or in limited conditions for measurement.

Key Words: speed, motor tests, children, evaluation, , norms, validity, reliability, representativity

Introduction

Development, following and evaluation of motor abilities is one of the main assignments of physical education and sports training, as well as one of the main criteria for sports selection in certain sport disciplines. Development of motor abilities is also one of the main goals of physical education (PE), defined in national curriculum for nine – years compulsory education in Republic of Macedonia (Bureau for the development of education, 2007), while in PE teaching process is defined as one of the concrete goals in the segment named as "movement" (Klincarov, 2007), goals that are equivalent on educational assignments. Motor abilities explain the differences between people and they are changed with systematic training. They are a result of humans` complex possibilities and they unique physical qualities, biochemical processes and functional changes (Kukolj, 2006). Motor abilities are permanent, exists entire life and are fundament in process of creation of motor habits. Manifestation and improvement of motor ability is possible only with their use and action (Gajić, 1985). Motor abilities are invisible; they exist in human latent space. Using simple or complex motor movements (tests), certain physiological processes are provoked and the reactions from these processes are noted, measured, valued and compared. Motor abilities are measured using different instruments that ables only their adjustment (Bala et all 2007).

Motor abilities in children are differently manifested and developed compared with adults. These is result of uncompleted development, uncompleted regulations of CNS, ongoing functional development, individual tempo of development, concerning different "biological time" on every individual and other characteristics specific for children age period. Therefore, beside regular demands for standardization and good metric characteristics, motor tasks used in tests for estimation of children's` motor abilities, should be conducted as a content of education curricula for certain age, or should be specially designed or modified for certain age group. According the authors Ikeda & Aoyagi (2007) is especially hard to select a motor tests for children that will be enough reliable, valid and practical because little children still have not developed sense for time and rivalry (Matsuda, 1961). Difficulties in realization of measurements of children motor abilities are noted in researches of Bala, 1999; 2007; Rajtamer, 1997; Popeska, 2009, 2011.

The speed is one of the abilities that define human's motor space and determine certain motor behavior. The level of development and manifestation of speed in different age periods is a condition for different development level and intensity on other motor abilities, as well as adopted movement habits and skills. The speed, in relation with other motor abilities (coordination, strength, balance, flexibility and preciseness) defines humans` motor status and

establishes it`s motor efficiency. As a complex anthropometric characteristic that exist in the space of human motor space, the speed is mostly defined as ability of the human to realize a certain motor activity for minor time (Zaciorski, 1975), ability when using muscle contractions in motor units certain body should pass the longest for shortest time (Opavski, 1975), ability to perform a simple motor tasks for shortest time (Kurelič et al.1975).From the aspect of structure of speed and it`s manifestation, three forms of manifestation are dominant: (1) Time of reaction or latent time of motor reaction (time passed from the appearance of the signal until the reaction of it); (2) Speed of segmental movements (time passed from the beginning of certain movement until it`s end); (3) Frequency of movement or segmentary speed (frequency on certain movement in period of time, or ability for fast contraction and relaxation on certain muscle groups) (Perič, 2003; Kukolj, 2006). These manifestations of speed are relatively independent but they accompanied one another in complex movements for translocation of the body or a certain body parts in space (Jovanovski, 1998).

The beginning of early school age, particularly 7 years old children or the period we are interested in, is an important period when it comes to speed and possibilities for its development. Development of speed in this period is a result of developed and improved nervous regulation. Namely, the period between 7 and 13 years is an ideal period for improvement of speed of movement (Weineck, 1990 at Age group development program), which is precisely developed in period from 7 – 8 years, from 8 -9 and between 10 and 11 years (Kukolj, 2006). Consequently, this improvement influence on improvement of speed of reaction that occurs in period between 7 and 10 years (Hahn, 1987 at Age group..), while for development of frequency of movement, significantly develops in periods from 7 to 9 and from 12 to 13 years. The development of speed reaches its pick in period at the age between 20 and 25. Possibilities for improvement of speed are limited because of its high percent of heredity h = 0.95 which is related with motor efficiency as an individual characteristic of the person (Jovanovski, 1998).

In PE curriculums, speed of movements is manifested in thematic field named as athletics, represented with contents like running with changes of directions, tempo and speed (fast, slow, moderate; forward, backward, cries - cross, left – right), running in different formations (lines, rows, circles etc), fast running on different distances, tasks with speed running as a part of different elementary games etc. Manifestation of speed as potential ability in children is a precondition for successful realization of these contents. From the other hand, realization of these activities contributes to improvement of speed as a motor ability. Objective estimation at changes in speed as result of successful realization of PE contents could be realized only using

standard procedures, or motor tests with good metric characteristics. These types of tests and estimation of their metric characteristics are the main purpose of this work.

Method of work

The aim of this paper is to determine the metric characteristics of motor tests used for estimation of speed at 7 years old children and normative for valuation of children's achievements. The research was conducted on a sample of 123 examiners, 7 years old male children, pupils in second grade in five primary schools in Skopje, Republic of Macedonia. The examiners were tested in three motor tests hypothetically used for estimation of speed. Following tests were used: 10 m running from flying start (BT10LS), running 4x10m (BT4x10) and cries - cross running 4x5м (BTZMT)[1]. The testes: 10 meters running from flying start (BT10LS) and cries - cross running 4x5м (BTZMT) are recommended by Perič (1991), while the test running 4x10m (BT4x10) was used and recommended by Dukovski (1984). All tests were realized with two repetitions and are measured in seconds. Aldo two repetitions is a small number considering the main goal – determination of metric characteristic. According the age and possibilities of examiners, this number is accepted and needed. This is also noted and recommended by other authors that realized researches with same age groups (Bala 1981, Pisot & Planinsec,2005)

Tests characteristics: discriminativity (sensitivity), asymmetric, homogeneity, reliability, validity and representatively are fortified for all three used tests. Discriminativity, asymmetric and homogeneity were determined using measures for tendency and dispersion, while reliability, validity and representativity were estimated based of Crombah α and Spearman – Brown`s (SB) coefficients of reliability[2], the value of significant root, the projections of isolated factor and communalities obtained using Hotelling procedure for determination of validity[3] and Kaiser-Meyer-Olkin`s measure[4] for reliability and representativity.

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 final table for estimation of children`s motor achievements is 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

---

[1] Detailed description of the performance of used tests and there measurements are available at the authors.

[2] Coefficients higher than 0.80 are considered significant

[3] Internal validity, between items from each test is significant when value is higher or equal to 0.80

[4] KMO – Kaiser-Meyer-Olkin – coefficient around **.**90 is excellent representativity, around.80 very good; around .70 good; .60 average; .50 the test have bad representativity and below.50 unacceptable

percentile – average achievement; from 5 to 25 percentile – below average achievement and under 5 percentile – very bad achievement.

Results and discussion

Basic descriptive parameters obtained at motor tests used for estimation of speed at 7 years old children, are presented in Table 1. Declination from normal distribution are noted for two of three tests, 10 m flying start (BT10LS) and cries - cross running 4x5м (BTZMT).

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
BT10LS1	2,39	0,44	0,04	18,45	1,9	4,13	2,23	1,59	2,88	0,16	p < ,01*
BT10LS2	2,45	0,47	0,04	19,35	1,89	4,25	2,36	1,29	2,02	0,13	p < ,05
BT4x101	14,48	1,78	0,16	12,27	10,4	22,11	11,71	0,90	1,95	0,08	p > ,20
BT4x102	14,68	2,10	0,19	14,30	10,5	22,3	11,8	0,96	1,44	0,10	p > ,20
BTZMT1	8,68	4,60	0,41	52,96	4,3	20,59	16,29	1,09	-0,33	0,28	p < ,01*
BTZMT2	8,51	4,30	0,39	50,50	4,1	18,4	14,3	0,97	-0,64	0,25	p < ,01

Analysis of approximate values obtained at test for estimation of speed at 7 tears old children, shows better results in second repetition in the test cries - cross running 4x5м (BTZMT), while at other two tests, better results are accomplished in the first repetition. Lower achievements in second repetition are probably result of children's motivation and maximal deployment in first measurement, that results with appearance of fatigue in next repetition.

Sensitivity calculated on bases of ratio between mean (x) and standard deviation (SD) (3:1), with exception of the test cries - cross running 4x5м (BTZMT), point out on sensitive (discriminative) tests or tests that are register and emphasize the differences between the achievements of examiners based on their results.

Values of the test for asymmetry for all used motor tasks and repetitions are positive, which means that most of the examiners achieved results that could be placed in the zone of lower achievements. These means, that for this sample of tests, our examiners achieved good results.

Coefficients for reliability: Crombah α and Spearman Brown coefficient (SB), presented in tables 2, 3 and 4 in all three used tests are very high (.91 to .99) that means that all three tests have high level of reliability. Using factor analysis, with application of Hotelling procedure at results from the two repetitions of all three used tests for estimation of speed, one significant root that explains variability of the system from 92.47% 10 m running from flying start (BT10LS), 92,63% for running 4x10m (BT4x10) and high 98.83% for the test cries - cross running 4x5м

(BTZMT). Highly explained variability, shows that results in all measurements for all three applied tests for estimation of speed are not significantly different. This is also confirmed with high and approximately similar projections of isolated factor (from .96 to .99). These results indicate to tests with high factor validity, which is also confirmed with high coefficients of correlation between repetitions (from .85 to .98).

Table (2). 10 m running from flying start (BT10LS), validity, reliability and representativity – 7 years old children

честици	r и SMC		H 1	h²
BT10LS 1	(.72)		.96	.93
BT10LS 2	.85	(.72)	.96	.93
Cronbach′s α	.92		Lambda	1,85
SB	.92		%	92,47
KMO	.50			

Table (3). Running 4x10m (BT4x10): validity, reliability and representativity – 7 years old children

честици	r и SMC		H 1	h²
BT4X10 1	(.73)		.96	.93
BT4X10 2	.85	(.73)	.96	.93
Cronbach′s α	.91		Lambda	1,85
SB	.92		%	92,63
KMO	.50			

Table (4). Cries - cross running 4x5м (BTZMT): validity, reliability and representativity 7 years old children

честици	r и SMC		H 1	h²
BTZMT 1	(.95)		.99	.99
BTZMT 2	.98	(.95)	.99	.99
Cronbach′s α	.99		Lambda	1,98
SB	.99		%	98,83
KMO	.50			

Homogeneity of results is confirmed with high values of communalities (from .93 to .99). The value of KMO index which is measure for representatives of the test, for all three used tests for estimation of speed is on the level of significance (.50).

In general, results obtained for validity, reliability and representativity of the tests indicate to test with significant metric characteristics. Comparing the results from three tests for

estimation of speed used at 7 years old children, the test cries - cross running 4x5м (BTZMT) have the best metric characteristics. The other two tests, 10 m running from flying start (BT10LS) and running 4x10m (BT4x10) also have good metric characteristics and mutually almost identical values of calculated parameters. Significant metric characteristics for all three applied tests for estimation of speed, gives an opportunity for their efficient use with 7 years old children in the teaching process of PE. In situations of limited conditions for realization of measurement or in situation where short battery of tests is needed as a test with the best metric characteristics from these group of tests, we recommend the test cries - cross running 4x5м (BTZMT). In the research conducted by Perič (1991), this test also shown good metric characteristics and is strongly recommended for further use in a work with pre – school children.

Beside metric characteristics, norms for evaluation of children's` achievements were also calculated as a task of this research. These norms are orientation values that could facilitate the teacher or the sport pedagogic in the process of following, evaluation and comparison of children's achievements. The norms are fortified using percentile clauses and percentile values. The result obtained reducing percentile distribution in five percentile classes are presented in Table 5.

Table 5. Norms for children` achievements in tests for estimation of speed

		Running 4x10m (BT4x10)	Cries - cross running 4x5м (BTZMT).
		7 years	7 years
1	Very bad achievement	Above 17,73(sec)	Above 17,15(sec)
2	achievement below average	17,72 – 15,80	17,14 – 12,96
3	average achievement	15,79 – 13,20	12,95 – 5,43
4	achievement above average	13,19 – 12,30	5,42 – 4,68
5	excellent achievement	Under 12,30	Under 4,68

Considering development characteristics and functional capacities of children at the age of seven, we recommend the number of repetition of all motor tasks to remain the same as in suggested methodology, or two repetitions for each tests for estimation of speed. As an addiction of these recommendation are suggestions from authors that realized similar researches (Bala, 1999, Delaš et all, 2008). During the process of realization of measurement with small children, several characteristics, such as short term attention on one activity, emotional instability (Gallahue, 1987 at Age group development program), disorientation from the goal and

understanding the process of testing as a game etc, should be considered. These and other similar characteristics of children at this age are one of the main practical issues and problems during the realization of these types of researches. (Rajmajer, 1997, Popeska, 2011). These findings allows certain activities, such as 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; Jürimae & Jürimae, 2001). 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.

Conclusion

Development, following and evaluation of motor abilities is one of the main assignments of physical education and sports training, as well as one of the main criteria for sports selection in certain sport disciplines. Development of motor abilities is also one of the main goals of physical education (PE). Motor abilities in children are manifested and developed differently compared with adults. Therefore, motor tasks used in tests for estimation of children's` motor abilities, should be contained content from education curricula for certain age, or should be specially designed or modified for certain age group.

The speed is one of the motor abilities that defines the human's motor space and determine certain motor behavior. The beginning of early school age, particularly 7 years old children or the period we are interested in, is an important period when it comes to speed and possibilities for its development, which in these period is a result of development and improved nervous regulation. Changes in motor abilities are one of the criteria for creation of final appraisal for PE as well as criteria for following of individual progress and improvement of every child. Therefore, motor tests with significant metric characteristics are the most objective manner for estimation of the effects from the teaching process.

The aim of this paper is to determine the metric characteristics of motor tests used for estimation of speed at 7 years old children and normative for valuation of children's achievements. The research was conducted on a sample of 123 examiners, 7 years old male children, pupils in second grade in five primary schools in Skopje, Republic of Macedonia. The examiners were tested in three motor tests hypothetically used for estimation of speed. Following tests were used: 10 m running from flying start (BT10LS), running 4x10m (BT4x10) and cries - cross running 4x5м (BTZMT). Results obtained in this research indicate to good metric characteristics. The used tests are discriminative, except the test cries - cross running 4x5м

(BTZMT). High values of Crombah α and SB (from .91 to .99) indicate to tests with high degree of validity which is confirmed the coefficients with high coefficients of correlation between repetitions (from .85 to .98). According the values of KMO index, the used tests have representativity at the level of significance.

Comparing the results from three tests for estimation of speed used at 7 years old children, the test cries - cross running 4x5м (BTZMT) have the best metric characteristics and it`s recommended in situations of limited conditions for realization of measurement or in situation where short battery of tests is needed. The other two tests 10 m running from flying start (BT10LS) and running 4x10m (BT4x10) also have good metric characteristics and mutually almost identical values of calculated parameters. For practice, calculated normative for evaluation on children's achievements are especially useful. These norms are orientation values that could facilitate the teacher or the sport pedagogic in the process of following, evaluation and comparison of children's achievements.

References (Литература)

1.*Age group development program for mens & womens artistic gymnastics*, Phase three, Federation Internationale De Gymnastique, FIG

2. Bala, G. (1981). *Struktura i razvoj morfoloških i motorićkih dimenzija dece SAP Vojvodine*. Novi Sad: Fakultet fizićke kulture.

3. Bala, G. (1986). *Logićke osnove metoda za analizu podataka iz istraživanja u fizićkoj kulturi*, Novi Sad: Fakultet fizičke kulture.

4. Bala, G. (1999) Some problems and suggestions in measuring motor behaviour of pre – school children. *Kinesiologija Slovenica*, 5 (1-2), 5 -10.

5. Bala, G., Stojanović, V. M. i Stojanović, M. (2007) *Merenje i definisanje motoričkih sposobnosti dece*. Novi Sad: Fakultet sporta i fizičkog vaspitanja.

6. 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.

7. Delaš et all, 2008). Delas, S.,Miletic., A. i Miletic, D. (2008) Uticaj faktora motorickih sposobnosti na izvodenje bazicnih motorickih znanja- razlike izmedu devojcica i decaka. *Facta Universitatis. Physical Education and sport*.vol.6. No 1. pp 31-39.

8. 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.

9. Haywood, K., & Getchell, N. (2004) *Life span motor development*. Champaign: IL. Human Kinetics.

10. Hoffman, J. (2006) *Norms for fitness, performance and health.* Champaign: IL. Human Kinetics.

11.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.

12. Јовановски, Ј. (1998) *Практикум по основи на психомоторика*, Скопје: Факултет за физичка култура.

13. Jürimäe, T. & Jürimäe,, J. (2001) *Growth, physical activity and motor development in prepubertal children*. New York: CRC Press.

14. 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)

15. Kukolj.M. (2006) *Antropomotorika*. Beograd: Fakultet sporta i fizickog vospitanja

(Kurelič et al.1975). Kurelic, N., Momirovic, K., Stojanovic, M., Sturm J., Radoevic, H. i Viskic – Stalec, N. (1975) *Struktura i razvoj morfolockih i motorickih dimenzija omladine*, Beograd: Institut za naucna istrazivanja Fakulteta za fizicko vaspitanje.

16. Malina, R., Bouchard, C. & Bar – Or, O. (2004) *Growth, Maturation and Physical Activity* (Second Edition). Champaign: Human Kinetic, Illinois.

17. Muzić, V. (1968) *Metodologija pedagoskih istraživanja*, Sarajevo: Zavod za izdavanje udžbenika.

18. Perić, D. (1991). *Komparativna analiza metodoloških sistema eksplikacije biomotorićkog statusa dece predškolskog uzrasta.* Doktorska disertacija, Beograd: Fakultet fizičke kulture Univerziteta u Beogradu.

19. Peric. D. (2003) *Antropomotorika, osnovi sportske lokomocije*. Beograd: Ideaprint.

20. Pišot,R. & Planinšec, J. (2005) *Struktura motorike v zgodnjem otroštvu*, Univerziteta in Primorskem, Koper: Institut za kineziološke raziskave.

21. Попеска, Б (2009а) *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.

22. Popeska, B. (2009b). Numeric and structural differences in motor tests for evaluation at same motor abilities implemented to the children at 6 and 7 years age. *Научна конференция на Русенския Университет, Научни трудове, Физическое воспитание и спорт,* Том 48, серия 8.2. 121 – 125.

23. Попеска,Б (2011) *Развој на морфолошките и моторичките димензии кај деца од машки пол на 6 и 7 годишна возраст*. Докторска дисретација. Скопје: Факултет за физичка култура.

24.Rajtmjer, D., Proje, S. & Vute, R. (1989) Informacijski sistem za spremljanje in vrednotenje motorićnih sposobnosti predškolskih otrok. *Športna vzgoja*. 37, (1-2), 9 – 12.

25.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.

26. Зациорски, М. (1975) *Физичка својства спортиста*, Београд: НИП "Партизан".

About the author (s)

PhD Biljana Popeska, Faculty of educational science,
University" Goce Delcev", Stip, Macedonia
biljana.popeska@ugd.edu.mk

PhD Orce Mitevski , Faculty of Physical Culture,
University Ss. Cyril i Metodius" – Skopje
ogimnstika@yahoo.com

PhD Jovan Jovanovski, Faculty of Physical Culture,
University Ss. Cyril i Metodius" – Skopje
jovanjovanovski@yahoo.com

PhD Snezana Jovanova – Mitkovska, *Faculty of educational science,*
University" Goce Delcev", Stip, Macedonia
snezana.jovanova@ugd.edu.mk