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“Manifestation, Assessment And Development Of Preciseness At 7 Years Old Children

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Abstract

Preciseness is one of the abilities that defines human motor space. It's related with successful realization on many movement tasks especially those related with ball games. The aim of this paper is to determine the manifestation and assessment of preciseness at 7-years old children and possibilities for its development applying PE contents. Preciseness was analyzed using 6 motor tests, applied on a sample of 123 seven-year old male examiners. Using adequate statistics methods we determined tests characteristics: discriminativity, reliability, validity and representativity. Obtained results suggest on good validity and poor reliability of applied tests. Three of the tests are recommended for future use for estimation of preciseness. Based on PE curriculum we recommended activities suitable for development of preciseness in children.

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Keywords: motor abilities, motor tests, tests characteristics, PE curriculum.

1. Introduction

Motor abilities are the essence of human motor space. Their development is based on human native characteristics and is result of development and training (Kukulj, 2006). Different levels of development of motor abilities suggest on different levels of motor efficiency and are related with development of human individual potentials (Jovanovski, 2013). Children's motor abilities are manifested and developed differently, compared with the same of adults (Jurimae & Jurimae, 2001; Pisot & Planinsec, 2005, Bala & Katic, 2009). Therefore, the issues related with development, following and assessment at pre – school children's motor abilities and motor abilities of children in the early school period are one of the most important research issues in kinesiology. Development of

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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 in assignments that are recognized in pedagogy as educational assignments. Motor abilities are also highly related with the acquisition of different motor skills and habits (Matic, 1978). Therefore, changes in motor abilities are one of the criteria for creation of PE final grade, criteria for following and evaluation of individual development and improvement on each child, as well as a manner for determination of efficiency of applied PE curriculum.

Preciseness is one of the abilities that define human motor space. It is manifested in movements when certain target should be hit, or when the movement should be performed by precisely defined path (Jovanovski, 2013). In many sports such as football, basketball, volleyball, karate, gymnastics etc., preciseness is one of the main components for success. Preciseness is commonly defined as ability to perform properly directed and optimally dosed movements (Kurelic et al, 1975; Gajic, 1985; Nicin, 2000). It is related with precise evaluation of spatial and time parameters on defined system, of movement and with appropriate movement reactions on those changes. Basic information for creation of main and corrective movement patterns for preciseness is created in the middle brain, helped by visual and kinesthetic senses (Jovanovski, 2013). Regarded to this, as a part of the abilities that defines human motor space, preciseness is closely related with coordination mostly because the realization of precise movements requires visual information or coordination eye – hand and eye – leg (Gajic, 1985).

According to the manifestation in different movements, preciseness is mostly manifested as preciseness with leading, where objects or body parts are led toward certain goal and preciseness with pitching/ throwing (Kurelic et al, 1975; Gajic, 1985). Another classifications of preciseness made by using different criteria are: preciseness with arm and preciseness with leg; according to the speed of realization of movements: fast and slow preciseness; considering the duration of preciseness movement: long - lasting and short lasting preciseness (Gajic, 1985; Jovanovski, 2013). Fatigue and emotional condition have a negative influence upon manifestation of preciseness. Some other factors that influence manifestation of preciseness are: the speed of flow of information, balance, concentration and attention, the level of training, age, gender, alcohol etc.

From the aspect of the structure of children’s motor space, most of the studies that investigate the structure of children’s motor space do not conduct tests for preciseness. In some of the analyzed researches where these types of movement tasks were included, preciseness is commonly isolated as independent latent dimensions defined as preciseness (Rajtmajer, D., & Proje, S., 1990; Rajtmajer, D, 1993); factor named as “fine motoric” or a mechanism for harmonization of motor units during performance of preciseness or mechanism for synergetic regulation. (Peric, D, 1991), preciseness with pitching from sitting and standing position isolated at 6 years old children (Popeska 2009; 2011); preciseness with leading and preciseness with pitching defined at 7 years old children (Popeska, 2009); preciseness with pitching objects with hand (Popeska, 2011).

We could not found enough information about the development of preciseness during the childhood, the degree of heredity, as well as the differences between males and females regarded the manifestation of preciseness. Considering the fact that manifestation of preciseness is related with coordination and depends from visual sensation and visual ability, information’s about their development could give same explanations upon sensitive periods and improvement of preciseness.

Considering the fact that preciseness is determined as one of the ability that defines the motor structure of children, as well as the fact that every age period has its own specifics, important issues of PE teaching process are manifestation, estimation and development of each motor ability in certain age period. Therefore, the aim of this paper is to suggest motor tests with good metric characteristics which are used for estimation of preciseness at 7 years old children and to suggest contents for improvement different types of preciseness identified at 7 years old children. Differences in the segment of motor development between children and adults, that are result of children’s uncompleted development, uncompleted regulations of CNS, ongoing functional development, individual tempo of development, concerning different “biological time” on every individual and other characteristics, emphasize the need of specific motor tests for every specific year of age. 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 (Bala, 1999; 2007; Rajtmajer, 1997; Peric, 1991; Popeska, 2011). According the authors Ikeda & Aoyagi

(2007) it is especially hard to select a motor test 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's motor abilities are noted in researches of Bala, 1999; 2007; Rajtmajer, 1997; Jurimae & Jurimae, 2001; Popeska, 2009; 2011.

2. Materials and methods

The research sample was consisted of 123 examiners, 7 years old male children, pupils in second grade in five primary schools in Skopje, Macedonia. The research was conducted as a part of larger study, realized by Popeska (2011). Preciseness was estimated using 6 motor tests, four tests for estimation of preciseness with throwing and two applied for preciseness with leading. Following tests were used: Throwing circles on stick (PIOBS), Throwing tennis ball in vertical target with arm (PITET), Throwing ball in horizontal target with arm (PITHC), Throwing ball in vertical target with leg (PIVCN), for estimation of preciseness with Throwing and Leading with short stick (PVGKS), Leading with long stick (PVGKD) for estimation of preciseness of leading. Selection of applied tests was based on children's age and possibilities, results of previous researches conducted with children, as well as recommendations of researchers that previously explored this issue (Dukovski, 1984; Rajtmajer & Proje, 1990; Rajtmajer, 1993; Peric, 1991; Popeska 2009; 2011). The first two tests: Throwing circles on stick (PIOBS) and Throwing tennis ball in vertical target with arm (PITET), were previously applied and recommended by Peric (1991), the test Throwing ball in horizontal target with arm (PITHC) is measured by the recommendation of Dukovski (1984), while the last three tests were designed from Metikos, Prot, Hofman, Pintar, & Oreb, (1989) used for estimation of preciseness of older examiners. These tests were modified and recommended for use with children by Popeska (2009).

All six tests were applied as three item tests, realized with three repetitions. Also, the number of repetitions is small, considering the main goal – determination of metric characteristic, small number of repetitions is acceptable considering the age, functional capacities and development characteristics of examiners. Small number of repetitions (two - three) when testing motor abilities in children is acceptable and recommended by other authors who realized similar researches with same age groups (Bala 1999; Pisot & Planinsec, 2005; Bala, Stojanovic & Stojanovic, 2007; Bala & Katic, 2009; Popeska, 2009; 2011).

According to the aim of the research, tests characteristics: discriminativity (sensitivity), asymmetric, homogeneity, reliability, validity and representativity were determined for all six applied 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 (coefficients higher than 0.80 are considered significant). Validity of motor tests is calculated using Pearson's – coefficient of correlation (r), the value of characteristic roots, factor scores of projections of isolated factor and communalities using Hotelling procedures. Internal validity or validity between items from same test is satisfy when values are higher or equal at 0.80. Kaiser-Meyer-Olkin's measure is used for estimation of reliability and representativity. 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.

Analyses of national PE curriculum for second grade is made in order to determine is there any contents and motor activities noted in the curriculum that required manifestation of preciseness, for which we determined that exists in children motor space (Rajtmajer & Proje, 1990; Rajtmajer, 1993; Peric, 1991; Popeska 2009; 2011).

3. Results

Basic descriptive statistics parameters for all three measures at all six applied tests for estimation of preciseness at 7 years old children are presented in Table 1. In Tables 2, 3, 4, 5, 6 and 7 we present the results obtained 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 preciseness.

Table1: Basic measures of central tendency, dispersion and normality of distribution of motor tests used for estimation of preciseness at 7 years old children (second grade)

	Mean	SD	Sx	KV	MIN	MAX	Range	skew	kurt	KS	p
PIOBS1	0,76	0,74	0,07	97,78	0	3	3	0,55	-0,55	0,26*	p < ,01
PIOB	0,87	0,88	0,08	100,86	0	3	3	0,78	-0,12	0,24*	p < ,01
S2											
PIOBS3	0,84	0,84	0,08	100,70	0	3	3	0,65	-0,44	0,25*	p < ,01
PITET1	6,38	3,21	0,29	50,26	0	13	13	0,09	-0,79	0,11	p < ,15
PITET2	6,75	3,53	0,32	52,26	0	16	16	0,23	-0,38	0,09	p > ,20
PITET3	6,38	3,65	0,33	57,15	0	14	14	-0,12	-0,87	0,09	p > ,20
PITHC1	3,46	2,81	0,25	81,46	0	12	12	0,77	0,44	0,13	p < ,05
PITHC2	3,87	2,84	0,26	73,38	0	13	13	0,74	0,26	0,13	p < ,05
PITHC3	3,95	3,03	0,27	76,67	0	12	12	0,71	-0,16	0,14	p < ,05
PIVCN1	3,91	2,61	0,24	66,86	0	11	11	0,56	-0,14	0,13	p < ,05
PIVCN2	3,98	2,51	0,23	62,98	0	11	11	0,68	0,12	0,16*	p < ,01
PIVCN3	4,02	2,29	0,21	56,94	0	11	11	0,56	0,14	0,12	p < ,10
PVGKS1	51,90	8,20	0,74	15,80	29	66	37	-0,54	-0,34	0,11	p < ,10
PVGKS2	50,89	8,48	0,76	16,67	27	66	39	-0,54	-0,10	0,07	p > ,20
PVGKS1	51,07	8,84	0,80	17,32	25	70	45	-0,56	0,12	0,08	p > ,20
PVGDS1	50,74	8,47	0,76	16,68	28	64	36	-0,67	-0,14	0,10	p < ,20
PVGDS2	51,29	8,00	0,72	15,59	31	66	35	-0,48	-0,56	0,08	p > ,20
PVGDS3	50,46	8,82	0,80	17,48	25	65	40	-0,57	-0,39	0,14	p < ,05

Table 2: Throwing circles on stick (PIOBS), reliability, validity and representativity obtained at 7 years old children

Item	r и MC	H 1	h ²
PIOBS 1	(.051)	.597	.357
PIOBS 2	.178 (.107)	.737	.542
PIOBS 3	.186 .304 (.110)	.742	.551
Cronbach's α	.465	Lambda	1,45
SB	.462	%	48,35
KMO	.580		

Table 3: Throwing tennis ball in vertical goal with arm (PITET), reliability, validity and representativity obtained at 7 years old children

Item	r and SMC	H 1	h ²
PITET 1	(.366)	.827	.683
PITET 2	.574 (.402)	.850	.722
PITET 3	.454 .501 (.292)	.785	.616
Cronbach's α	.755	Lambda	2,02
SB	.757	%	67,36
KMO	.683		

Table 4: Throwing ball in horizontal goal with arm (PITHC), reliability, validity and representativity obtained at 7 years old children

Item	r and SMC	H 1	h ²
PITHC 1	(.162)	.723	.522
PITHC 2	.285 (.177)	.739	.546
PITHC 3	.374 .394 (.229)	.797	.635
Cronbach's α	.620	Lambda	1,7
SB	.619	%	56,79
KMO	.632		

Table 5: Throwing ball in vertical goal with leg (PIVCN), reliability, validity and representativity obtained at 7 years old children

Item	r and SMC	H 1	h ²
PIVCN 1	(.230)	.753	.568
PIVCN2	.372 (.283)	.791	.626
PIVCN 3	.450 .507 (.336)	.833	.694
Cronbach's α	.700	Lambda	1,89
SB	.705	%	62,95
KMO	.659		

Table 6: Leading with short stick (PVGKS), reliability, validity and representativity obtained at 7 years old children

Item	r and SMC		H 1	h ²
PVGKS 1	(.409)		.850	.722
PVGKS 2	.598	(.395)	.840	.706
PVGKS 3	.472	.452 (.268)	.768	.589
Cronbach's α	.754		Lambda	2,02
SB	.756		%	67,27
KMO	.676			

Table 7: Leading with long stick (PVGKD), reliability, validity and representativity obtained at 7 years old children

Item	r and SMC		H 1	h ²
PVGDS C 1	(.339)		.803	.645
PVGDS 2	.524	(.456)	.860	.740
PVGDS 3	.531	.640 (.462)	.863	.745
Cronbach's α	.795		Lambda	2,13
SB	.796		%	71,03
KMO	.697			

3.1. Analysis of national PE curriculum for second grade

The school subject Physical and health education in primary education in the national system of nine-year compulsory education in Republic of Macedonia is realized with three school hours during a week, or 108 school hours during a school year. PE teaching process is realized according the national curriculum as a fundamental document, suggested by the Bureau of Education. Acquisition of the contents from the school subject Physical and health education in the first cycle of primary education is a fundament for enrolment in different sports activities in the further education and everyday life. The aims and tasks suggested in PHE curriculum are according with the main educational goal: holistic and harmonious children development, according with their individual abilities and development characteristics. Development of motor abilities, aquisition of different movement skill according to the personal ability of every child as well as learning to selfesteem personal abilities are some of general aims of PHE curriculum in the first cycle of nine year education.

PHE curriculum for second grade is structured in five compulsory thematic unions and five optional thematic units that are realized in cooperation with parents and local community. Compulsory thematic unions are named as: Lining and organized movements, Movements for *body shaping*, *Basics of athletics*, *Basics of gymnastics* and *Games*, while optional units are named as *activities in water*, *activities at snow*, *driving a bike*, *hiking*, *school sport and sports project*. Realization of activities from optional thematic units are in relation with possibilities of local environment, its natural and material facilities and cooperation with local community. Different forms and variations of fundamental movements, particularly different forms of locomotor, unlocomotor and manipulative movements are integrated in compulsory thematic units. For every thematic union in PHE curriculum following parameters are prescribed: aims, contents, examples of concrete activities, method of work, didactic recommendations for successful implementation of curriculum and its efficient practical realization as well as manners for evaluation of children's achievements.

Development of preciseness and development of coordination when throwing, are defined as concrete goals in thematic union *Basics of athletics*, realized as a part of PHE curriculum for second grade. Activities such as throwing ball at certain distance, throwing ball to hit concrete target, throwing ball in net, throwing ball over lower barrier, as well as throwing and catching a ball are activities suggested for improvement and development of preciseness at second grade pupils.

4. Discussion

According to the results presented in Table 1, for all 6 repetitions in every one of 6 applied tests for estimation of preciseness, declination from normal distribution is obtained only at test throwing circles on stick (PIOBS) and at second repetition at the test throwing ball in vertical target with leg (PIVCN). Progressive improvement of average achievements from first to the third repetition is obtained for the tests: throwing ball in horizontal target with arm (PITHC), throwing ball in vertical target with leg (PIVCN), for estimation of preciseness with throwing and leading with short stick (PVGKS). Best achievement in first repetition is obtained at the tests leading with long stick (PVGKD). The same group of children was tested with same tests one year earlier (Popeska, 2011). As expected, better results in all tests for preciseness are obtained at the age of 7, which points out on positive development changes and improvement of preciseness. According to the values of the tests for discriminativity (the relation of x and SD, 3:1) and asymmetry (skwenes) all four tests applied for estimation of preciseness with throwing have low

discriminativity, they do not measure the differences in children's achievements and are hard to perform (Table 1). The two tests used for estimation of preciseness with leading, leading with short (PVGKS) and long stick (PVGKD), have good discriminativity, they measure the small differences between the examiners and for 7 years old children, these tests are easy to perform and they achieved homogeneous results.

Results obtained for the coefficients of reliability and representativity as well as the results for test validity are presented in Tables 2,3, 4 and 5. For every of four applied tests, one significant root is isolated, which suggest that applied tests are valid, or measure same ability. Isolated factor explains the variability of the applied systems from 48 % - 67%. This means that other external factors could influence to the final test result. The variability of the test throwing circles on stick (PIOBS) is explained with 48,35%, variability of throwing tennis ball in vertical target with arm (PITET) is explained with 67.36%, 56,79 % throwing ball in horizontal target with arm (PITHC) while the test throwing ball in vertical target with leg (PIVCN) is explained with 62.95% is the variability obtained for the test. Internal validity equal or higher than .80 is obtained only at the tests throwing tennis ball in vertical target with arm (PITET) and throwing ball in vertical target with leg (PIVCN).

Values obtained for Spirman – Brown (from .46 to .76) and Cranach's α coefficients of reliability (.47 to .76.) obtained from four movement tasks used for estimation of preciseness are low, not satisfactory and suggest on bad reliability of applied tests. If comparing the values of coefficients for reliability obtained at four applied tests, the test throwing tennis ball in vertical target with arm (PITET) (SB .76 and Cronbach's α .76), have coefficients closest to the required limit for reliability (0.80). Lower values of coefficient of reliability point out on great dependence of the final results from the influence on other unsystematic factors such as concentration, problems with sight, bad coordination eye – arm and eye – leg, emotional anxiety etc. Values for KMO index from .58 to .68 obtained at four tests applied for preciseness of throwing, point out on average level of representativity of the tests.

Results for the validity, coefficients of reliability and representativity for two tests for estimation of preciseness with leading are presented in Tables 6 and 7. One significant root for every factor is isolated. The variability of the test with leading with short stick (PVGKS) with 68% while variability of motor task leading with long stick (PVGKD) is explained with 69%. Values for internal validity (from .78 to .86) suggest at tests with good validity. The values for SB coefficient of reliability .796 and for Cronbach's α .795 obtained at the test leading with long stick (PVGKD) are at the limit point .80. Coefficients of reliability (.756 and .754) at the test leading with short stick (PVGKS) are lower and this test could not be considered as reliable. Values for KMO index .676 and .697 tests for preciseness with leading, point out on average level of representativity of the tests.

Obtained results for satisfactory validity and bad representativity obtained at the test for evaluation of preciseness with pitching or good validity and representativity at the limit of significance, confirms the findings of Ikeda & Aoyagi (2008) that it is difficult to determine both, the reliability and validity of tests for young children's motor ability.

Some explanations about the reasons about insignificant reliability of the tests for preciseness could be find in conditioned of preciseness, related with children's age and development characteristics. Final result in tests for preciseness are conditioned with proper perception of the target, the speed of transfer of information as well as the ability to perform a technically correct, that means proper synchronization of the speed or strength of the movement with movement with the object that should be thrown, pitch or leaded. Other explanation about obtained results is in relation with factors that influence the manifestation of preciseness. Namely, preciseness is conditioned by the coordination eye – arm and eye – leg, emotional condition and irritability. Because of ongoing development process, not completed synchronization of body parts and slower process of information analyses, at seven years old children, the process of coordination between eyes, arms and legs are not finished completely. Children also upsets very easily especially in new and unknown situations (Gallahue, 1987, at Age grope development).

Manifestation of preciseness in early school period also depends from other development characteristics specific for children. Some of these characteristics explains some of the results obtained in our study. Namely, it's determined that in the period between 5 and 7 years, children, in general are farseeing and not prepared to look close for a long period (Gallahue, 1987, in Age group development). Individual tempo of development on every child, as well as the fact that children with minor problems with vision were also included in testing, could be one of the explanations for variety of results. Regarded this, in childhood, visual sensation improves in the period between 5 and 7 years of age (Haywood & Getchel, 2004). After the age of 5 improves the ability to follow objects with eyes and control of movements with eyes, visual sensitivity continuously improves, but is not yet well developed until the age of nine (Williams, 1983 referred in Haywood & Getchel, 2004).

The other important issue is regarded to the analyses of PHE curriculum for second grade and possibility to develop preciseness using the motor activities conducted in the current curriculum. Preciseness exist in children's motor space (Rajtmajer & Proje, S, 1990; Rajtmajer, 1993; Peric, 1991; Popeska, 2009; 2011). As presented in analyses and development of preciseness is defined as one of the goals of PHE teaching process, but very few contents are suggested for its realization. Only several typed of throwing ball at certain distance, throwing ball to hit concrete target, throwing ball in net and over lower barrier are suggested in current curriculum. Therefore, PHE curriculum should be enriched with PE contents and activities that will improve preciseness with pitching and leading (Popeska, 2014) Regarded to this we suggest:

- Implementation of movement tasks and games which aim will be to strike at certain goals – horizontal or vertical, static or moving targets with different size, placed on a different distances using different objects to strike (tennis balls, standard balls, medical and pilates balls with different size etc.). For example: leading sticks with different length used to strike static and moving targets; picado on the wall (vertical goal) or at the floor (horizontal goal) with ball with different sizes leaded with arm or with leg; leading the ball using other object for example sticks, with or without hitting in certain goal or target, or activities like golf, cricket, baseball etc. Realizing activities like these or similar to them, beyond development of preciseness, in the same time we also improve the ability for performance of precise and explosive movements, as well as coordinated movements with arms and legs.
- Application of movement tasks and games with leading objects with different size and length. For example: sticks with different length used to strike certain static or moving targets, picado played with different sticks with different length, leading ball or other object using sticks, with or without striking a certain goal, activities similar like cricket, golf, grass hockey, baseball and others. Suggested contents could be implemented in the current PE program as new innovative contents and which will have a positive influence on improvement of preciseness with leading.

Suggested contents, based on exercises for preciseness are especially applicable in schools with lack of material conditions, equipment or sports facilities, because these types of activities could be applied and realized at small space, with objects used in children's everyday life and what is very important, are safe for use from children.

5. Conclusion

As a composed part of abilities that defines the human motor space, Preciseness has an important role in PHE teaching process. In many sports such as football, basketball, volleyball, karate, gymnastics and other preciseness is one of the main components for success. Relations between preciseness and other motor abilities, as well as the impact of regular physical activity of maintaining of different types of preciseness 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 precisenes in every certain period of children's age, 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.

The aim of this paper is to suggest a motor tests with good metric characteristics for evaluation of preciseness at 7 years old children and based on analyses of current PHE curriculum for second grade to suggest contents that will enrich the current curriculum and will have an impact to improvement and development of preciseness. At this way, using different type of movement, PE contents and movement patterns based on fundamental movements skills through play and movement games, children will learn and practice skills that become building blocks for more complicated movements and will be a core for future sport improvement (Juruimae&Jurimae, 2011)

In order to determine tests with significant metric characteristics for evaluation of preciseness, a research was realized on a sample of 123 examiners, 7 years old male children, pupils in second grade in five primary schools in Skopje, Macedonia. Six tests for estimation of preciseness were used. Following four tests: Throwing circles on stick (PIOBS), Throwing tennis ball in vertical target with arm (PITET), Throwing ball in horizontal target with arm (PITHC), Throwing ball in vertical target with leg (PIVCN), were used for estimation of preciseness with throwing, and two tests: Leading with short stick (PVGKS) and Leading with short stick (PVGKD) were used for estimation of preciseness of leading. Tests characteristics: discriminativity (sensitivity), asymmetric, homogeneity, reliability, validity and representatively are determined for all applied tests. Obtained results point out on tests with different metric characteristics. Tests for estimation of preciseness with throwing have low discriminativity, are hart to

perform and they don't measure differences between children's achievements. This group of tests have satisfy validity, bad reliability and average level of representativity of the tests. Comparing results between four applied tests for preciseness with throwing as suitable for further use with seven years old children, we recommend the tests: throwing tennis ball in vertical target with arm (PITET) and throwing ball in vertical target with leg (PVCN). Implementation of these tests in PHE teaching process is important because they estimate preciseness with throwing and pitching with different body parts (arms and legs) that allow development on different movement qualities. Both tests for evaluation of preciseness with leading are discriminative, easy to perform and participants achieved homogeneous results. These two tests have good validity and reliability at the lower part of significance. According to the obtained results, better tests characteristics were obtained for the test leading with long stick (PVGKD) and it is recommended for future use. Obtained results confirms the findings of Ikeda & Aoyagi (2008) that it's difficult to determine both the reliability and validity of tests for young children's motor ability.

Lower values for reliability are explained by factors that have an influence on preciseness, children's age and development characteristics. Final result in tests for preciseness are conditioned with proper perception of the target, the speed of transfer of information, relations with coordination and its level of development, as well as the ability to perform a technically correct movement that means proper synchronization of the speed or strength of the movement with movement with the object that should be thrown, pitch or leaded, emotional condition, perception, attention and other factors contribute to lower results of reliability of the tests. Some of suggested tests should be modified in order to be more suitable for application with young children.

Speaking about the evaluation of motor ability and realization of motor measurements, researchers that work on this issue have 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 sort term focus, disorientation from the goal, lack of motivation, emotional instability as well as understanding of testing as a game, not as a assignment (Jurimae & Jurimae, 2001; Gallahue, 1987; Rajmajer, 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; Jurimae & Jurimae, 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.

Related to holistic development and possibility to develop preciseness using motor activities conducted in the current curriculum, we have suggested several new contents based on manipulative movements that requires manifestation of preciseness. On the other hand, when improving motor abilities, children have the opportunity to learn new movement skills and to improve the old one. Previously suggested contents could be implemented in the current PE program as new innovative contents that will have a positive influence on improvement of preciseness with leading. Beyond this, implementation of these contents at regular PE classes will have an influence on development of other motor abilities, as well as a positive influence on cognitive segment, emotional and social component especially in situations when implementing movement tasks with leading, throwing and striking in different targets as a part of different movement games, etc.

References

- Bala, G. (1999). Some problems and suggestions in measuring motor behaviour of pre – school children. *Kinesiologija Slovenica*, 5(1-2), 5 -10.
- Bala, G., Stojanovic, V.M., & Stojanovic, M. (2007). *Merenje i definisanje motorickih sposobnosti dece*. [Measurement and definition of childrens motor ability. In Serbian.] Novi Sad: Fakultet sporta i fizickog vaspitanja.
- Bala, G., & Katic, R. (2009). Hypotetical model in testing integrated development of preschool children. *Collegium Antropologicum*. 33 (2), 353 – 362.
- 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.
- Dukovski, S. (1984). *Struktura i razvoj morfoloskih i biomotorickih dimenzija dece predškolskog uzrasta u Skoplju*. [The structure and development if morphologic and motor dimensions of pre – school children form Skopje. In Serbian.] Doktorska disertacija, Beograd: Fakultet za fizicko vaspitanje.
- Federation Internationale De Gymnastique (1999) *Age group development program for mens & womens artistic gymnastics*. Phase three.
- Gajic, M. (1985). *Osnovi motorike coveka*, [Bases on human motoric. In Serbian.] Novi Sad: OOUR Institut fizicke kulture.
- Haywood, K., & Getchell, N. (2004). *Life span motor development*. 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*, 5, 9 – 22.

- Јовановски, Ј. (2013). *Антропомоторика* [Anthropomotrics. In Macedonian.] Скопје: Универзитет „Св.Кирил и Методиј“, Факултет за Физичка култура.
- Jurimae, T. & Jurimae, J. (2001). *Growth, physical activity and motor development in prepubertal children*. New York: CRC Press.
- Klincarov, I. (2007). The role of physical education teacher education quality in school physical education process in Republic of Macedonia, In *Proceeding Book of 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). *Антропомоторика* [Anthropomotrics. In Serbian.] Beograd: Fakultet sporta i fizickog vospitanja.
- Kurelic, N., Momirovic, K., Stojanovic, M., Sturm J., Radoevic, H., & Viskic – Stalec, N. (1975). *Struktura i razvoj morfolockih i motorickih dimenzija omladine*, [Structure and development of morphologic and motor dimensions in youth. In Serbian.] Beograd: Institut za naucna istrazivanja Fakulteta za fizicko vaspitanje.
- Metikos, D., Prot, F., Hofman, E., Pintar, Z., & Oreb, G. (1989). *Mjernje bazicnih motoricnih dimenzija sportasa*, [Measurement of basics motoric dimensions in athletes. In Croatian.] Zagreb: Komisija za udbenike i skripta, Fakultet za fizicku kulturu Sveucilista u Zagrebu.
- Malina, R., Bouchard, C. & Bar – Or, O. (2004). *Growth, Maturation and Physical Activity* (Second Edition). Champaign: Human Kinetic, Illinois.
- Nicin, Dj. (2000). *Антропомоторика – теорија*. [Anthropometrics – theory. In Serbian.] Novi Sad: FFK.
- Peric, D. (1991). *Komparativna analiza metodoloskih sistema eksplicacije biomotorickog statusa dece predškolskog uzrasta*. [Comparative analyses methodologic system of explicatio of biomotor status in pre – school children. In Serbian.] Doktorska disertacija, Beograd: Fakultet fizicke kulture Univerziteta u Beogradu.
- Peric, D. (2003). *Антропомоторика, основи спортске локомociје* [Anthropomotrics, bases of human locomotion. In Serbian.] Beograd: Ideaprint.
- Pisot,R., & Planinsec, J. (2005). *Struktura motorike v zgodnjem otrostvu*, [Motor structire in children. In Slovenian.] Koper: Univerziteta in Primorskem, Institut za kinezioloske raziskave.
- Popeska, B. (2009). *Determination and comparation on the latent structure of motor space in male six and seven years old children*. (Unpublished barchelor thesis) Skopje: University Ss Chiril and Methodius, Faculty of Physical Education.
- Popeska, B. (2011). *Development of morphologic and motor dimensions in children in the age period of six and seven years*. (Unpublished doctoal dissertation). Skopje: University Ss Chiril and Methodius, Faculty of Physical Education.
- Rajtmjer, D., & Proje, S. (1990). *Analiza zanesljivosti in faktorska struktura kompozitnih testov za spremljanje in vrednotenje motoricnega razvoja predškolskih otrok*. *Sport*. 38 (1-2), 48 – 51.
- Rajtmajer, D. (1993). *Komparativna analiza psihomotoricne strukture deckov i deklci, starih 5 – 5,5 let*. *Sport*. 41, (1-2), 36 – 40.
- Rajtmajer, D., (1997). *Comparative analysis of the structure of motor abilities of younger children*, In M. Pavlovic (Ed). *Proceedings of the III International symposium Sport of the young*. Bled, Slovenia (216 - 221). Ljubljana: University of Ljubljana. Faculty of Sport.