

## **THE EXAMINATION OF THE EFFECTS OF BASKETBALL TRAINING PROCESS ON SPEED AND COORDINATION DEVELOPING ON 9-10 YEARS OLD GIRLS**

*(Research note)*

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### **Abstract:**

*Research was conducted toward determination the effects of a current program of physical education teaching on motor abilities coordination and speed of girl pupils. The research involved a total sample of 102 girl pupils from 3<sup>rd</sup> and 4<sup>th</sup> grade of elementary school. The subjects were classified in an experimental and a control group. The experimental group was made of 54 girls, and they were exercising according to the planned instructions where the basketball played the primary role. The control group of 48 girls was practicing according to official instructional plan and program for PE of the Republic of Serbia. At the beginning of the academic year, initial measurement was performed, followed by experimental final measurement at the end of the experiment. Research data was processed using the SPSS standard statistics procedure. The multivariate procedures were used in this research, and they were: the multivariate analysis of covariance MANCOVA and multivariate analysis of variance MANOVA. The given results lead us to the conclusion that for the experimental factor is responsible for the significant changes in the evaluation of coordination and the speed.*

**Keywords:** *physical education, motor abilities, motor tests, young school girls, experimental group, control group, initial measurement, final measurement, analysis of covariance*

### **INTRODUCTION**

Basketball is based on the teaching and development of fundamental motoric, i.e. motoric behavior through the learning of the basic basketball positions, elements and skills through natural ways of moving and play, in non-competitive surroundings. By different moving activities, learning about their body and its motoric, a child develops its motoric, acquires different motoric skills and habits and develops motoric activities. In this work, the subject of the research are segments of the anthropological areas which refers to the appearance of appropriate motor abilities-coordination and speed. Coordination, as the basic motor ability, is very complex as the levels of the movement regulation can change. In addition, the regulation includes energetic mechanisms as well as mechanisms of simple structuring of movement. The appropriate level of coordination is necessary during each motor activity. Also, speed is very complex motoric ability.

It is known that the use of physical exercise stimulation only within regular physical education classes is not sufficient to provoke essential improvement of motoric

abilities. Therefore it is very important not only to try to animate schoolgirls for participation in additional sporting activities, especial basketball, out of regular physical education classes, but, what is even more important, to increase the number of physical education classes a week, with the ambition to provide sufficient stimulation to ensure a harmonic somatic growth and development.

Throughout the history, basketball has constantly changed and improved. From the former slow activity with a ball, it grew into an exceptionally dynamic activity with defined movements. The time for fulfillment of technical-tactical assignments has become shorter and shorter, and the speed of actions in sports combat, in relation to the first phase, reached an unimagined scales. Taking into account that within the basketball, the motoric activity is primary, it is logical to conclude that the system of research should be directed toward gaining as much information about the basic and specific motoric activities, as their correlation and mutual influence are, and all that to supplement hypothetically with assumed equations of specifications. Basketball belongs to the most dynamic sports. The development of contemporary

sport is more and more based on scientific researches and cybernetic principles in organizing and conducting the athletic training. This kind of approach is especially present in basketball which is characterized by situational, complex, and not standard movements of variable rhythm and intensity, conditioned by different situations which appear in a sports combat.

## METHODS

In this work, the subject of the research are segments of the anthropological areas which refers to the appearance of appropriate motor abilities-coordination and speed. The battery for the evaluation of coordination consists of the following tests: MPON, MSL3, MONT. The battery for the evaluation of speed consists of the following tests: MTAR, MTAN, MPZD. During the 2011/12 academic year, a research was conducted so as to determine the effects of a current program of physical education teaching on motor abilities coordination and speed of the girl pupils. The research involved a total sample of 102 girl pupils from 3<sup>rd</sup> and 4<sup>th</sup> grade of the elementary school. The subjects were classified in an experimental and a control group. The experimental group was made of 54 girls, and they were exercising according to the planned instructions where the basketball played the primary role. The control group of 48 girls was practicing according to official instructional plan and program for PE of the Republic of Serbia. At the beginning of the academic year, initial (first) measurement was performed, followed by experimental final (second) measurement at the end of the experiment. Research data was processed using the SPSS standard statistics procedure. The multivariate procedures were used in this research, and they were: the multivariate analysis of covariance, MANCOVA, multivariate analysis of variance MANOVA and the t-test. Also, the monovariance procedures were used, and they were: the variance analysis, ANCOVA, ANOVA and the interval of entrust.

The usage of exercises for the development of coordination integrates specific motoric movements of basketball.

Examples:

- manipulation of a ball in one place (leading a ball in one place, leading a ball in one place alternately forward, backward with both hands, etc.)
- manipulation of a ball in movement (circulating a ball around the body during the motion in a straight line, leading two balls in movement, motion in straight line while simultaneously passing a ball, etc.).

## RESULTS

Considering the tables of the central and disperse parameters of motoric ability, speed and coordination from group to group, it can be seen that the results of both sub-samples are very much homogenous, and that there are no quantities which significantly differ from expected and realistically possible values.

During the process of analyzing of the final state by usage of a multivariate analysis of covariance (MANCOVA), it is determined that analyzed groups of girls statistically significantly differ among them in their motoric abilities, and that there is a clearly defined line between some groups of examinees, which means that even after the neutralization of the differences from the initial state, there is a significant difference among the analyzed groups on the final measurement, which practically means that there is a significant difference in the contribution of the treatment.

Already noticed difference among the examinees of the experimental and control groups for every single characteristic of motoric space of speed is given by the analysis of covariance (ANCOVA).

The experimental group which underwent the treatment from the scope of basketball gave the results of the interval of entrust which show the existence of the differences in the utilisation of the experimental group with

*Table 1. Central and disperse parameters and normality of distribution of motoric variables-experimental group (54)*

Initial	$\bar{X}$	SD	MIN	MAX	KV %	SKEW	KURT	p
MPON	20.15	5.16	11.43	32.45	25.62	.77	.32	.549
MSL3	52.30	12.45	39.17	92.24	23.80	1.64	2.80	.236
MONT	26.00	5.41	16.84	35.64	20.82	.13	-1.17	.685
MTAR	19.31	3.04	14.00	26.00	15.74	.27	-.73	.285
MTAN	25.59	2.97	20.00	31.00	11.62	-.21	-.92	1.00
MPZD	12.80	2.27	10.00	18.00	17.73	.90	-.38	.002
Final	$\bar{X}$	SD	MIN	MAX	KV %	SKEW	KURT	p
MPON	21.81	6.57	0.92	13.13	41.22	1.13	0.64	.353
MSL3	47.65	8.78	1.23	30.08	62.58	-0.01	-1.26	.722
MONT	23.45	9.96	1.39	11.23	46.99	1.1	0.02	.076
MTAR	21.83	4.11	16.00	31.00	18.83	.50	-.76	.973
MTAN	28.06	3.95	21.00	35.00	14.08	.01	-.91	.999
MPZD	13.61	2.48	10.00	19.00	18.19	.63	-.54	.791

Table 2. Central and disperse parameters and normality of distribution of motoric variables-control group (48)

Initial	X	SD	MIN	MAX	KV %	SKEW	KURT	p
MPON	23.10	8.32	11.43	55.01	36.03	1.65	3.23	.723
MSL3	56.41	14.09	39.17	98.02	24.97	1.28	1.43	.570
MONT	28.71	9.30	16.84	63.65	32.40	1.56	2.86	.824
MTAR	20.21	3.38	14.00	28.00	16.74	.19	-.84	.993
MTAN	26.17	3.60	19.00	35.00	13.78	.18	-.23	.891
MPZD	13.21	2.30	10.00	18.00	17.39	.66	-.62	.084
Final	X	SD	MIN	MAX	KV %	SKEW	KURT	p
MPON	20.60	6.85	.99	11.25	46.22	18.01	1.65	3.01
MSL3	51.03	11.02	1.59	23.51	85.87	50.86	.44	1.07
MONT	25.83	8.15	1.18	15.99	59.18	23.85	1.65	4.13
MTAR	21.54	3.38	16.00	29.00	15.68	.15	-1.00	.861
MTAN	27.54	3.78	21.00	35.00	13.71	.26	-.67	.994
MPZD	14.02	2.39	10.00	19.00	17.06	.38	-.63	.888

Table 3. The significance of the difference among the groups of the examinees in relation to the evaluation of speed-final

	n	F	p
MANCOVA	3	4.571	.000

Table 4. The significance of the differences among the groups of the examinees in relation to the measurements of speed- final.

	F	p
ANCOVA		
MTAR	4.258	.006
MTAN	6.573	.000
MPZD	3.385	.019

two characteristic of the motoric space of speed.

Speed is in great degree a genetic ability and firstly depends on the number and percentage of so called fast

speed fibers. Most scientists considers that the percentage of inheritance is above 90 %, so it can not be developed by training much more, but the ability of application of speed in a certain athletic activity can be increased. By the development of other motoric abilities, the conditions for its demonstration through the efficient movement are created, in order to make possible for „natural“ speed to be optimally demonstrated. So, the possibility of training is reduced to the fact that the certain technique of used movement is adapted to the available individual speed and the constitution of the body of an individual.

The speed of basketball players is shown in the speed of reaction with sudden movements, in the speed of running in short distances which are determined by the size of a basketball field, and the speed of performing technical-tactical skills with or without a ball. The speed of situational movement in basketball is represented by the complex demonstration of speed because it depends on the speed of reaction at the beginning of the movement, the speed of single movements (pushing away with one leg, raising a tight etc.), and it also

Table 5. The significance of the difference among groups of the examinees according to the interval of entrust of corrected surroundings of examinees in the evaluation of speed-final

Groups	Variables	Corrected surroundings	Interval of entrust
EXPER KONTR	MTAR	23.02	21.99
EXPER KONTR	MTAN	29.12	28.14
EXPER KONTR	MPZD	14.16	14.15

Table 6. The significance of the difference among the groups of the examinees in relation to the evaluation of coordination-final

	n	F	p
MANCOVA	3	4.082	.000

Table 7. The significance of the differences among the groups of the examinees in relation to the measurements of coordination- fina.

ANCOVA	F	p
MPON	5.798	.001
MSL3	3.123	.027
MONT	6.999	.000

Table 8. The significance of the difference among groups of the examinees according to the interval of entrust of corrected surroundings of examinees in the evaluation of coordination-final.

Groups		Variables	Corrected surroundings		Interval of entrust	
EXPER	KONTR	MPON	19.18	20.13	-1.79	-.11
EXPER	KONTR	MSL3	48.47	49.64	-3.56	1.22
EXPER	KONTR	MONT	24.43	24.69	-1.26	.74

depends on the pace (frequency) of steps. All the given elementary forms of showing speed influence the speed of the whole situational movement.

During the process of analyzing of the final state by usage of a multivariate analysis of covariance (MANCOVA), it is determined that analyzed groups of girls statistically significantly differ among them in their motoric abilities, and that there is a clearly defined line between some groups of examinees, which means that even after the neutralization of the differences from the initial state, there is a significant difference among the analyzed groups on the final measurement, which practically means that there is a significant difference in the contribution of the treatment.

Already noticed difference among the examinees of the experimental and control groups for every single characteristic of motoric space of coordination is given by the analysis of covariance (ANCOVA). It shows that there are differences among all the characteristics and they are:

1. polygon backwards (mpon)  $p=.001$ ,
2. slalom with three balls (msl3)  $p=.027$ ,
3. dexterity on the ground (mont)  $p=.000$ .

The experimental group which underwent the treatment from the scope of basketball gave the results of the interval of entrust which show the existence of the differences in the utilisation of the experimental group with one characteristic of the motoric space of coordination which is:

1. polygon backwards (mpon) (-1.789-.110)

## CONCLUSIONS

The given results lead us to the conclusion that the experimental factor is what is responsible for the significant changes in the evaluation of speed and coordination.

The given results lead us to the conclusion that the experimental factor is responsible for the significant changes in the evaluation of the three motoric variables, for the evaluation of coordination that we examined, the effects of the experimental treatment, which had the primary role with all of them, as it gave a statistically significant difference among the experimental and control groups. By analyzing the programs by which the groups practiced, we can say that these results are expected.

Considering the difference of the influence of the treatment, it can be pointed out that the experimental program of the basketball with all its characteristics widely contributed to all its segments to the improvement of coordination and speed in a whole, while the

treatment of the control group, which represented the official actual program for PE for younger boy pupils did not gave better results in any of the segments of motoric ability of coordination and speed within the examinees.

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