EYE-HAND COORDINATION IN THIRD FORM PUPILS

GIDU DIANA VICTORIA[1], STRATON ALEXANDRU[1], HRIȚAC FLORENTINA[2]
[1] Ovidius University of Constanta, Faculty of Physical Education and Sport,Constanta, ROMANIA
[2] Theoretical High School „Mihail Kogalniceanu", Constanta, ROMANIA
e-mail: campiap@yahoo.com

Abstract
Purpose. The present study propose that eye-hand coordination in third form pupils can be enhanced by physical activities.
Methods. For recording the level of eye-hand coordination we used three motric tests – rounder-ball throw on a static mark; darts and, multiple dribble (20 m.).
Results. There was significant differences between experimental and control group (p < 0.01) on all the three testes.
Conclusions. Exercises and operational structures used during the experiment were well selected and properly dosed for these subjects.
Key words: motor coordination, eye-hand coordination, school-children.

Introduction

Motor coordination is regarded as a highly complex psychomotric skill that relies on other psychomotric skills and has interrelationships with motor skills. Coordinative skills include the full range of possibilities for event coordination, but also flexibility in the process of implemententation of physical movements (R.S. Johansson et al., 2001; B. Greenspan, 2005). They are conditioning by the capabilities to lead, to take and develop motor skills and, they are based on the nervous system and muscle efficiency (G. Rață, B.C. Rață, 2006).

Coordination can be trained in different ways, depending on age, gender and the level of retention and development of other skills, taking into account the fact that it's a part of genetically determined ability, with a low training posibility (L. A. Mrotek, J.F. Soechting, 2007; J.D. Crawford, W.P. Medendorp, J.J. Marotta, 2004).

It is assumed that the development of eye-hand coordination can be done in third form pupils by conducting games and relay race. To accomplish this aim, by using different methods and modern means to develop eye-hand coordination, we have established the following objectives:

1. Determining the overall skill level of students participating in the experiment.

2. Using standardized tests and modern means to develop eye-hand coordination.

3. Establishing a comparison between the results of the experimental group and control group.

Methods

The experiment took place between 24 November 2008 and 27 March 2009 and it have two stages: first - initial testing of students and the second - final testing of students participating in the experiment. The experiment was conducted in Mihail Kogalniceanu Highschool (school gym), in Constanta county.

In the experiment were participated 28 students of third class, 14 girls and 14 boys. After initial testing they were divided into two groups: experimental and control. Each of the two groups have many components 14 (7 girls and 7 boys in each group).

Identification data of subjects are presented in Table 1.

Table 1. Identification data of subjects participating in the experiment.			
Groups	Age (years)	Height (cm)	Weight (kg)
Experiment (n = 14)	10.48 ± 0.34	145.21 ± 0.25	39.07± 0.42
Control (n = 14)	10.74± 0.26	145.78± 0.67	40.60± 0.45
n, number of subjects.			

For testing eye-hand coordination we used the following tests:
1. Rounders throwing balls at a fixed target;
2. Darts;
3. Multiple dribbling (with running in straight line), on a distance of 20m..

Results

Table 2. Results of control group at initial and final testing.

Tests	Initial testing	Final testing
Rounders throwing balls at a fixed target (points)	53,21± 8,22	59,28 ± 5,49
Darts (points)	51,07± 5,94	65,35 ± 3,65
Dribbling in a straight line (s)	10,29± 0,45	10,12 ± 0,35

Statistical analysis of data from Table 2 revealed that the results in initial testing of the control sample were not significantly different from final testing.

However, in absolute terms the final test results has improved compared to the initial test results, on all 3 testes. This increase in absolute value show a natural development - physical and motric - of the students.

Table 3. Results of experimental group at initial and final testing.

Tests	Initial testing	Final testing
Rounders throwing balls at a fixed target (points)	55,42 ± 8,29	65,35 ± 4,98 [a]
Darts (points)	52,14 ± 3,23	74,28 ± 8,05 [a]
Dribbling in a straight line (s)	10,3 ± 0,39	9,85 ± 0,28 [a]

a - significantly different from the initial test, p<0.01.

At the level of this group, statistical analysis of data revealed that, in each sample, the final testing results are significantly better than the initial test results, p<0.01.

Thus, throwing the rounders ball in fixed target, we obtained t = 6.222, <0.01; in darts, t = 8.637, p<0.01; to dribble in a straight line 20m., t = 11.250, p<0.01. Therefore, we conclude that the proposed new operational structures have lead to increased eye-hand coordination indices at that age.

Our results are consistent with those of other researchers (R. S. Johansson et al., 2001; J. D. Crawford et al., 2004), who found that the specific work coordinative capacity leads to improved performance.

The only difference between our study and theirs is the subjects age (10 years old for our subjects versus 19 years old for their subjects).

In the following we will compare results obtained in two batches to final testing.

1. Rounders throwing balls at a fixed target
Experimental group received an average of 65.35 ± 4.98 points and the control group 55.71 ± 7.55 points (Figure 1). Statistical analysis showed that the experimental group showed significantly higher values than the control group (t = 4.016, p <0.01).
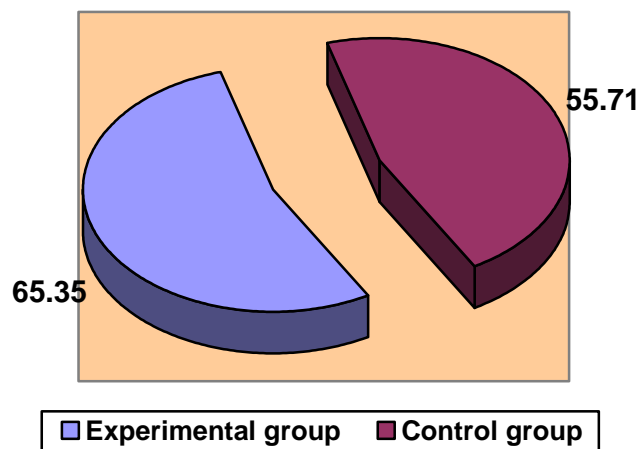

Figure 1. Scoring test throwing the rounders ball in fixed target

2. Darts

Experimental group obtained 74.28 ± 8.05 points, while the control group 54.64 ± 7.71 points (Figure 2). Statistical analysis showed that the experimental group achieved better results than the control group (t = 6.612, p <0.01).
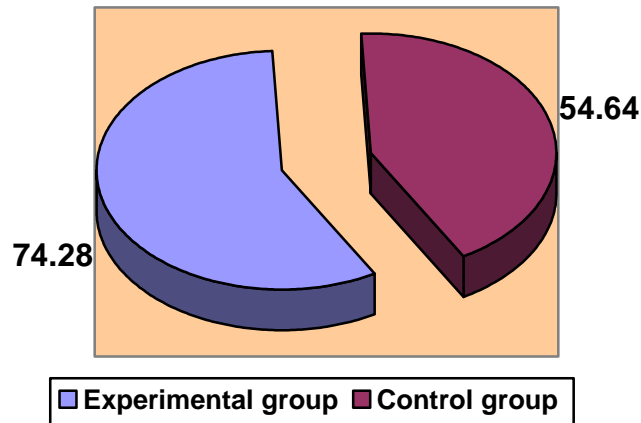

Figure 2. The scores obtained from test "darts" of the two groups.

3. Multiple dribbling in a straight line (20 m)

In this test the experimental group obtained 9.85 ± 0.28 points, while the control group 10.23 ± 0.37 points (Figure 3). Statistical analysis showed that the experimental group achieved significantly better results than the control group (t = 3.800, p <0.01).
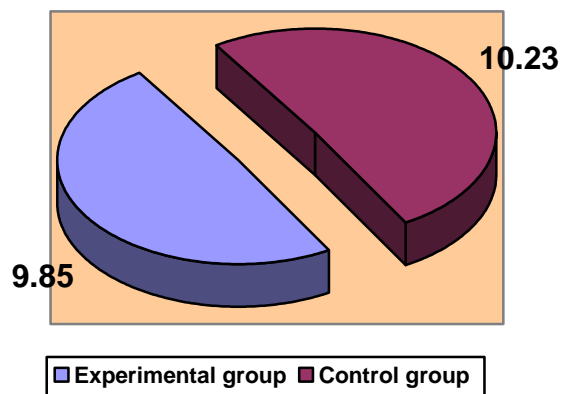

Figure 3. The scores obtained from test " dribbling in a straight line " of the two groups

Conclusions

1. Experimental group showed significantly better results in final testing, compared to initial testing (p<0.01).

2. The control group showed no significant differences between the two tests - initial and final - (p>0.05).

3. Experimental group showed significantly better results than control group on the final testing in all tests that have been administered.

4. Exercises and operational structures used during the experiment were well selected and properly dosed for these subjects.

Working hypothesis has been verified; the proposed operational structures have accomplished the purpose for which they were designed - to improve eye-hand coordination, in third form pupils.

References

CRAWFORD J.D., MEDENDORP W.P., MAROTTA J.J., 2004, *Spatial transformations for eye-hand coordination*, J. Neurophysiol., Jul; 92(1): 10-19.

GREENSPAN, B., (2005) *Eye-Hand Coordination*, http:// www. ebeanstalk. com /articles /eye-hand-coordination.php

JOHANSSON, R. S., WESTLING, G., BÄCKSTRÖM, A., FLANAGAN, J. R. 2001, *Eye–Hand Coordination in Object Manipulation,* The Journal of Neuroscience, September 1, 21(17): 6917–6932.

MROTEK, L. A., SOECHTING, J. F., 2007, *Target Interception: Hand–Eye Coordination and Strategies,* The Journal of Neuroscience, July 4, 27 (27): 7297-7309;

RAȚĂ, G., RAȚĂ, B.C., 2006, *Apitudinile în activitatea motrică,* Edit. Edu Soft, Bacău: 9-30; 243-277.