

## DEVELOPMENT OF PSYCHOMOTOR APTITUDE – THE BALANCE – BY EXERCISES SPECIALLY CREATED WITHIN THE FRAMEWORK OF THE BASKETBALL DISCIPLINE IN THE 5TH AND 6TH FORMS PUPILS

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**ABSTRACT.** Due to the importance of the ability - balance - in the basketball game, this paper presents a series of exercises for improving this psychomotor skills. During the first phase specific exercises as responses to different signals were conceived under our guidance with the entire class, which were then practiced. During a second phase, after having understood the task, the children split into teams needed to conceive similar exercises. The most significant were then practiced with the entire class. The research had been comprised of four phases: a pretest, a test during which independent variables were applied, followed by a final evaluation, and at the end a final test. The results of the research have shown that the exercises used contributed to the improvement of balance and we recommend that they should be used during physical education classes, mentioning that these are to be adapted and even supplemented according to the age of the children, the existing infrastructure and their training level. This paper presents the most significant exercises conceived and applied to the trial group.

**Keywords:** *trial, balance, specific exercises, psychomotor aptitude.*

**REZUMAT.** *Exerciții pentru dezvoltarea aptitudinii psihomotrice - echilibrul - prin exerciții special create în cadrul disciplinei baschet la clasele V-VI.* Datorită importanței în jocul de baschet a echilibrului, această lucrare prezintă o serie de exerciții care să dezvolte această aptitudine. În prima fază, sub îndrumarea noastră, au fost concepute și s-au exersat exerciții specifice, urmând ca, în faza a doua, după înțelegerea sarcinii, elevii împărțiți în formații de lucru să conceapă exerciții analoage, cele mai semnificative fiind exersate cu toată clasa. Cercetarea a cuprins patru etape: un preexperiment, un experiment în care s-au aplicat variabilele independente, urmate de o evaluare finală, iar la sfârșit un retest. Rezultatele cercetării ne-au demonstrat faptul că exercițiile folosite au contribuit la dezvoltarea echilibrului și recomandăm utilizarea lor în lecțiile de educație fizică, cu precizarea că aceste exerciții să fie adaptate și chiar completate în conformitate cu vârsta elevilor, baza materială existentă și nivelul lor de pregătire. Lucrarea de față prezintă cele mai semnificative exerciții create și aplicate lotului experimental.

**Cuvinte cheie:** *experiment, echilibru, exerciții specifice, aptitudine psihomotrică.*

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## **Introduction**

Balance is an indispensable mechanic condition of motility and a basic function in the practical activity, static and dynamic of man. This function provides the stability of positions and orientation of the movements on space coordinate, strengthening and directing interrelation between body and environment. Without balance, the body would remain under the influence of blinded forces, internal or external.

The stability is determined by the following factors:

- ❖ the size of the polygon support;
- ❖ the position of the center of gravity as against the base support;
- ❖ the distance between the center of gravity of the body and the support surface.

The sense of balance improves under the influence of practicing physic exercises and especially those specific ones.

## **Hypothesis**

We consider that by applying an appropriate strategy, pupils from secondary school (together with the teacher) can conceive specific exercises for the improvement of the ability: balance.

## **Material and methods**

### ***Location***

The trial took place at “Nicolae Titulescu” school from Cluj-Napoca. The school is well equipped for meeting the demands of the school curriculum for basketball.

The school dispose two basketball hall: one inside and the other outside, special arranged intended for instruction process of basketball.

### ***Subjects of the trial***

Pupils from grades V and VI of “Nicolae Titulescu” school Cluj-Napoca were subjects in the trial.

Number of sample of the form Table no.1:

Grade	Boys		Girls		Sum
	Trial	Control	Trial	Control	
V.	14	14	14	14	56
VI.	13	13	12	12	50
Sum	27	27	26	26	106

106 pupils took part in the trial, 52 girls and 54 boys, equally divided into trail groups and control groups.

The trial groups were made up of pupils from grades V A and VI B, and the control groups of pupils from groups V B and VI A.

### ***Organization, phases and development of the trial***

The trail took place under normal conditions during the physical education classes with focus on (learning topics) basketball, according to the structure of the school year, split into semesters and focusing on the suggested work hypothesis.

The trail took place during April - June 2013

The trial consisted of 4 phases:

Phase no. 1 - *pre-trial*: April, 10<sup>th</sup> - 14<sup>th</sup> 2013.

Phase no. 2 - *trial* (per se): April, 15<sup>th</sup> - May, 15<sup>th</sup> 2013.

Phase no. 3 - *post-trial*: May, 18<sup>th</sup> - 22<sup>th</sup>.

Phase no. 4 - *retesting* June, 5<sup>th</sup> - 12<sup>th</sup> 2013

### ***Investigation Methods***

The ability to maintain balance on one leg is tested by maintaining balance on a special device. The balance rail is a piece of wood, 4 inches thick, 2 inches wide and 60 cm long.

With hands on hips, the subject climb device on one leg (optional), so that the longitudinal axis of the foot is parallel to the longitudinal axis of the rail. The other leg is bent back, about 45-50 degrees, without touching the device.

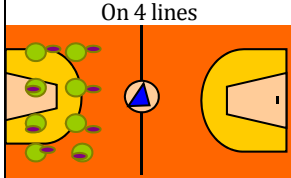
In this position, the performer is trying to maintain balance as long as possible with the eyes closed. Position obtained was timed. The timer stops when one of these deviations happens: the performer touched the ground with his free foot, descended from the device, lifted his hands on hip and opened his eyes.

The subject is entitled to two attempts and the best time in seconds and tenths of seconds is recorded.

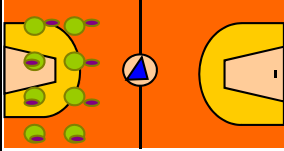
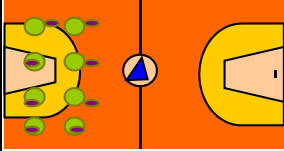
In parts 2, 3 of the lesson and in the fundamental part 5 (actual trial), during each lesson the improvement of the ability was especially trained for 10 – 12 minutes. During the first phase specific exercises as responses to different signals were conceived under our guidance with the entire class, which were then practiced. During a second phase, after having understood the task, the children split into teams needed to conceive similar exercises. The most significant were then practiced with the entire class, using up front practicing.

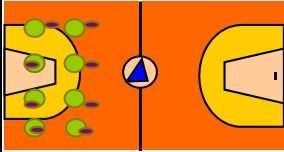
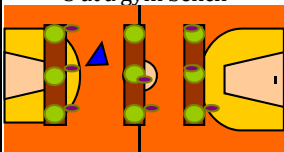
In the following we present the most significant exercises conceived and applied to the trial group.

EXERCISES CONCEIVED AND APPLIED TO GRADES V A AND VI B

No.	Initial position	Content of the exercise	Dosage	Work format	Training forms
1	Support squat, hands supported on the ball	Stand on one leg (at choice) the other lifted high backwards, ball up forward with the trunk slightly bent forward.	4 X	On 4 lines 	Up front practice
2	On knees	Getting on knee front support (at choice), the other leg raised up backwards (balance on one knee), maintaining the position for 3 sec	4 X	On 4 lines	Up front practice individual pace
3	Standing with eyes closed, ball in front of the body	Lifting on tiptoes and maintaining position 6-8 seconds. ↳ Variant: - inserting the rotating of the ball around the hip - inserting the bouncing and catching the ball	4 X	On 4 lines	Up front practice individual pace

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4	Standing with eyes closed, holding the ball in front of the body	Lifting one leg in one direction and arms in main and intermediate directions.	6 X	On 4 lines. 	Up front practice individual pace
5	Stand on the narrow side of the gymnastics bench	Eyes closures, ball rises forward and maintaining position 5-6 seconds.	4 X	Groups of 4 on each bench	Working in groups
6	Stand on medicinal ball	Lift in standing on tiptoes, than on heels alternately (with or without rotating the ball around the hip).	10 X	On 4 lines	Up front practice individual pace
7	Stand on medicinal ball	Lifting a leg in one direction, at choice with different movements of the arms.	6 X	On 4 lines	Up front practice individual pace
8	Stand on medicinal ball, eyes closed	Bending knees into tucked position followed by getting back into the initial position ↳ <u>Variant</u> : - from tucked position the student will dribble the ball 4 times with one arm followed by standing, then getting back into the tucked position and performing another 4 bouncings with the other arm (this drill is made with eyes closed)	6 X	On 4 lines 	Up front practice individual pace
9	Stand on medicinal ball	360 degree turn to the right, then turn to the left by stepping (successive steps) ↳ <u>Variant</u> : - same drill with dribbling the ball	4 X	On 3 lines	Up front practice individual pace
10	Standing	Standing dribbling while getting into tiptoes, followed by getting on the heels, with the knees bent.	10 X	On 4 lines	Up front practice individual pace

11	Standing on right leg, the left one slightly raised forward	Dribbling the ball with the right arm followed by the left arm (alternativ). ↳ Variant: - dribbling the ball from one hand to the other through the front - while dribbling, getting on tiptoes and then on heel.		 <p>On 4 line</p>	Up front practice individual pace
12	Standing	Walking on tiptoes with dribbling on a 20 m distance.	3 X	4 in a row	Up front practice on rows
13	Standing	Dribbling by walking on a straight line (facing forward, then backward towards the direction of movement), on a distance of 10 m.	2 X	4 in a row	Up front practice on rows
14	Standing, eyes closed.	Dribble the ball, while lifting on tiptoes and maintaining the position 6-8 seconds.	4 X	On 4 lines	Up front practice individual pace
15	Standing on the narrow side of the gymnastics bench	5-6 seconds standing dribbling (knees slightly bent), followed by catching and holding the ball in both hands, with eyes closed for 4 seconds.	4 X	 <p>3 at a gym bench</p>	Up front practice individual pace
16	Stand on medicinal ball	Standing dribbling, (knees slightly bent), followed by catching and holding the ball in both hands, with eyes closed for 4 seconds. ↳ Variant: the ball is not held in hands, but continuous dribbling.	8 X	On 4 lines	Up front practice individual pace

## Results

Statistic indicators regarding the "Static balance" - Trial group (boys)  
Table no.3:

Cls	Trial group								
	Average			S.D			C.V.		
	T1	T2	Ret.	T1	T2	Ret.	T1	T2	Ret.
V	2,702	3,714	3,45	0,552	0,358	0,45	20,4	11,64	13,2
VI	2,250	3,046	3,02	0,45	0,398	0,42	20	13,09	13,1

Statistic indicators regarding the "Static balance" - Control group (boys)  
Table no.4:

Control group								
Average			S.D			C.V.		
T1	T2	Ret.	T1	T2	Ret.	T1	T2	Ret.
2,76	2,86	2,82	0,675	0,607	0,61	24,48	21,25	21,27
2,35	2,6	2,61	1,052	1,001	1,035	44,76	38,5	38,3

Statistic indicators regarding the "Static balance" - Trial group (girls)  
Table no.5:

Cls	Trial group								
	Average			S.D			Average		
	T1	T2	Ret.	T1	T2	Ret.	T1	T2	Ret.
V	2,71	3,34	3,17	0,51	0,83	0,78	18,8	25,06	24,1
VI	2,3	2,92	2,8	0,58	0,74	0,76	25,5	25,54	23,0

Statistic indicators regarding the "Static balance" - Control group (girls)  
Table no.6:

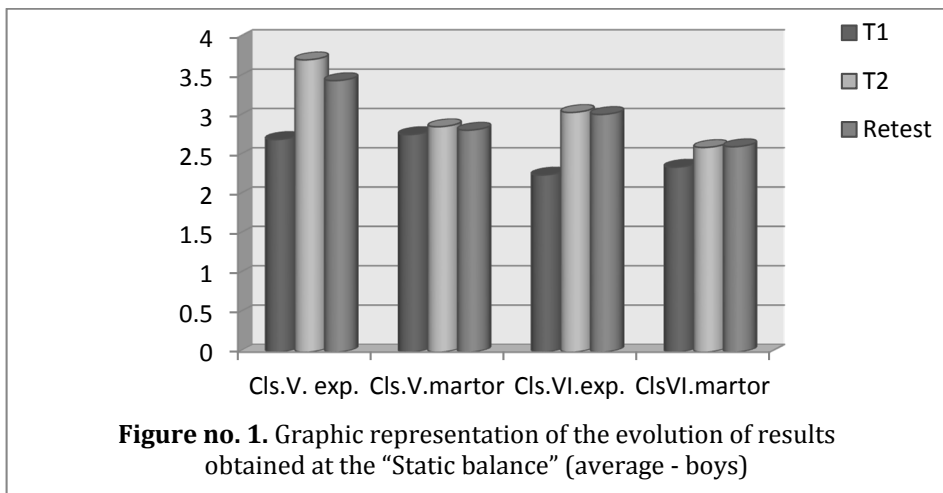
Control group								
S.D			Average			S.D		
T1	T2	Ret.	T1	T2	Ret.	T1	T2	Ret.
2,79	2,86	2,82	0,502	0,40	0,44	18	14	15,7
2,34	2,47	2,5	0,773	0,74	0,76	33,0	30,2	27,1

Significance of the difference between the average in trail groups  
Table no.7:

Grade	Test "t" student
Grade V boys	2,9
Grade V girls	2,2
Grade VI boys	2,1
Grade VI girls	2,3

With the boys' groups the average indicates significant progress from T1 to T2 for the entire trial group. (Figure no. 1)

The variability coefficient indicates high homogeneity in T2 for the trial groups and T1 control groups and medium homogeneity in T1 in the trial groups and T2 groups.

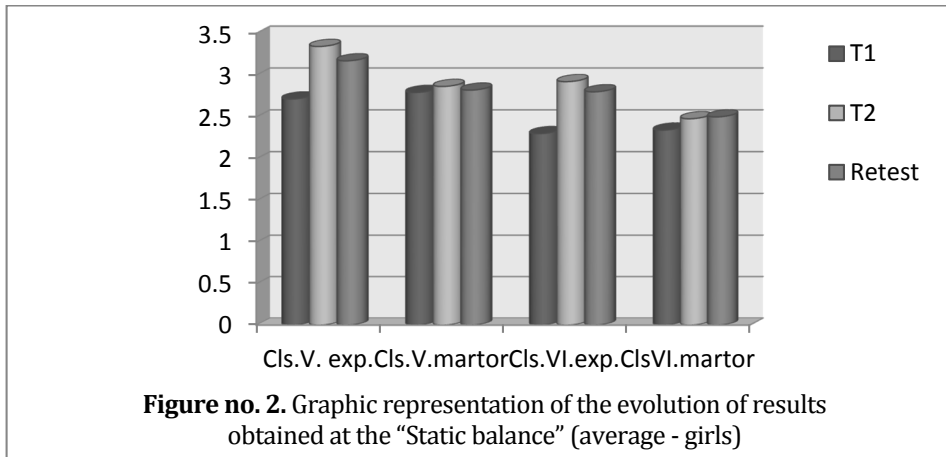


The girls' trial groups show better values of the average in T2 as compared to T1 (Figure no. 2).

The variability coefficient shows medium homogeneity in all research groups.

During the retesting all grades of the research, except grade VI girls' control group, show a setback.





Grade VI trial groups record a more significant improvement than grade V trial groups.

The calculated value of "t" is higher with all trial groups than the value of "t" at the significance boundary  $P=0,05$ , except grade V boys, where it is higher event that value "t" at boundary of  $0,02$ .

So, the hypothesis is infirmed, as the differences between the averages of the results are statistically significant.

## Conclusions

1. Based on the date results, we can confirm that the exercises conceived and applied are efficient and contribute to the improvement of accuracy and orientation of the body in space, which are necessary to play basketball.

2. Comparing the trial's results, we had observed the fact that the more were the attitude of students positive the higher were the results.

3. The retest results point the necessity of sustained practice of exercises, otherwise, the level of development of the psychomotor aptitudes decrease.

4. For the most part, the "t" test highlight a significant parameter on the probability of  $0,05\%$  and in some cases even at  $0,02\%$ , which reinforce the fact that the results are not accidental.

5. The results of the research show that the exercises, which were practiced, contributed to the improvement of accuracy and body orientation in space and we recommend that they are used during physical education classes, mentioning that these are to be adapted and even supplemented according to the age of the children, the existing infrastructure and their training level.

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