

EXPERIMENTAL STUDY ON SELECTION AND OPTIMIZATION OF SPECIFIC PHYSICAL TRAINING IN HANDBALL GAME ACCORDING TO DOMINANCE OF THE CEREBRAL HEMISPHERES

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Abstract: *This study is an interdisciplinary approach to the analysis of the selection process on the axis: specific physical training - level functional dominance of the cerebral hemispheres, the purpose was to identify a possible determinism in this direction. Research subjects were organized into two groups of 20 children (handball beginners players) ranging from age 11 to 12 years old. The experimental group was set up by an hemispherical model made in advance by analyzing a representative sample of senior athletes and the control group included athletes selected in accordance with the selection criteria established in the sport. After this step, it was applied a series of samples two times (interval of a year) to identify possible differences in the evolution of sports for the subjects of the two groups. The overall conclusion of this study was that the use of hemispheric dominance criterion leads to efficient selection process.*

Key words: *selection, physical training, cerebral hemispheres.*

1. Introduction

The selection of sports involves a choice made on the basis of set of objective criteria to detect the most valuable human resources for practicing different sports. For a long time, this process is no longer one empirical but one organized and carried out scientific for conducting to objectives choice [1].

The content of specific physical training is oriented primarily toward developing the specific effort capacity for a particular sport discipline and motor qualities combined that determine specific yield.

Specific physical preparation is carried out with strict ways specialist that educates motor qualities combined claimed by the peculiarities of sport, the muscle groups involved in the effort, the specific request type [8].

For handball game, the content of specific physical preparation [3], [5] is geared towards two major directions, namely: development of the particular effort capacity and motor qualities combined differentiated primarily engaged in the activity. It is not intended to replace the multilateral physical training, the relationship between the two is one of

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mutual conditioning. Most common configurations of motor qualities combined existing in handball practice are: speed regime with strength and force, force regime with speed, speed endurance and strength and skill regime with speed.

The concept of dominant hemisphere emerged as a result of discovering a dysfunction in the left hemisphere for language function realization. Mentioned concept is equivalent to the functional asymmetry and indicate the contribution that the cerebral hemispheres have to achieve mental functions. In this context, is aimed specific functional aspect of the two hemispheres and expressed that these two structures contribute unequally to the manifestation of various behaviors [2].

Objective explanations on the issue of brain dominance have materialized due to the emergence of The Whole Brain Model that initiated and developed by Ned Herrman and his team. This theoretical system includes horizontal approach (left hemisphere and right hemisphere), studies of R.Sperry, M.Gazzaniga, J.Bogen on brain splitting into two halves and the research of Paul MacLean (brain model in three dimensions: reptilian, limbic and neocortex). This integrative model is made on four dimensions called quadrants or specializations [4], [6], [7] :

- *The Left Cortical Sector (LCo)*. When the quadrant is enabled, person proves to process information and ideas analytically, uses logical reasoning, analyze things thoroughly as well as all their characteristics precisely to make the right decision. Also prefer to use a mathematical approach to the technical and scientific concepts.

- *The Left Limbic Sector (LLi)*. Activating this sector reveals that person is very attentive to details and also has great control over his emotions. This issue is actually a consequence of several actions that it performs: to order, to classify, to

plan, to organize. Thus, life is lived following a several rules and regulations in the sense that everything is clear, safe and controllable. Uncertainty and discomfort may occur when it is necessary rapid adaptation in short time or when there are unpredictable situations.

- *The Right Cortical Sector (RCo)*. Enabling this specialization requires that the person to think overviews, focuses on the perception and understanding of the whole. It uses imagination and intuition strongly in solving its problems, has many ideas associates in interesting combinations, it combines various events and facts thereby finding innovative solutions. Given these characteristics, the subject matter is often suitable for artistic activities.

- *The Right Limbic Sector (RLi)*. When a person has enabled the sector stronger, then it has a series of predispositions: is very sociable, it likes to communicate verbally and mostly nonverbal, has many passions, feels good moods of those around, spirituality is concerned, is preoccupied with ideals and has no emotions when it comes of talking in front of an audience.

2. Organizing the Research

Research took place in the H.C. Dinamo sports club, sports unity dedicated to sports training for children and juniors to the game of handball.

Before this experimental approach, I have composed a selection model [9] focus on hemispheric cerebral dominance, model that was developed by evaluating a significant number of athletes, senior level. This theoretical system of reference has two options: for left dominant subjects (LCo-75,4%, LLi-64,5%, RCo-76,5%, RLi-52,1%) and for the right dominant (LCo-67,7%, LLi-80,3%, RCo-61,5%, RLi-75,7%).

According with this model, I made up the experimental group and in control

group I included subjects randomly chosen, select only based on criteria established in current sports practice. All subjects of this research were aged 11-12 years old and they were practicing handball at level of initiation.

After this phase, it followed the initial testing that included a set of samples for identifying the level of specific physical training. To check the sport evolution in time, in relation to hemispheric configuration, after one year it has reached the final testing time, when the same tests were repeated.

Important to note is that the training methods were similar for all the subjects of the research, there was not used the variant of individualized training or special conditions for any subject.

3. Material and methods

The method being eligible for use in the research was that of the testing. This method was oriented in two directions:

- A. For identifying the level of cerebral dominance, using Questionnaire of preferences act [6];
- B. For identifying the level of specific physical training, using Running speed 30 m, Long jump with elk from a standstill.

Handball throwing by 3 steps elk, Move in the triangle.

Description of the tests:

– *Questionnaire of preferences act* comprises 72 items grouped into four sections A, B, C, D, each of which has 18 items that correspond to four brain areas: left cortical, cortical right, left limbic, limbic law. The answer variants fall on a continuum from 1 to 5, where 1 is very low agreement to claim the item, and 5 strongly agree. Intermediate variants 2, 3 and 4, expressing different weights agree. This questionnaire provides relevant data on the coordinates of the relationship Rationality

catch-Emotionality-mode operating left-right mode of operation.

Running speed 30 m. The test was carried out with starting standing, the time obtained was clocked from the first movement to the end result of the distance of 30 m was recorded in seconds and tenths of seconds.

– *Long jump with elk from a standstill.* Two tests were performed, enabling a single swinging arm for moose and recorded the best result. Measured the distance from the vertex (the initial position), to heel (final position). The result was recorded in meters and centimeters.

– *Handball throwing by 3 steps elk.* Perform a moose more than 3 steps and use a ball statutory for children, giving each subject two attempts. Using a tape measure calibrated in meters distance range from toe support to the place exactly where the ball touched the ground.

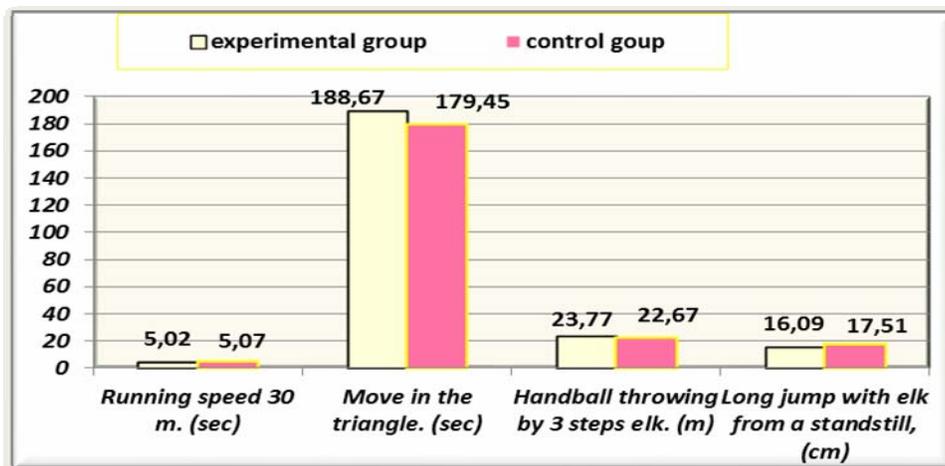
– *Move in the triangle.* Draw a triangle whose top is in the middle of the semicircle straight line from 9 m, height of the triangle is 3 m, the base of the triangle representing a straight line semicircle of 6 m, which measures 3 m top three triangles and their tangent is drawn by a circle with a diameter of 30 cm. The player is initially facing triangle top with his left foot from the left circle triangle. He starts signal to the right, with added steps until he reaches the foot, in the other circle at the base of the triangle, then moving full speed toward the tip circle triangle that is bound to touch it with one foot, then, must reach from the circle on which the original. The movement continues to circle from the top right triangle, further to circle to the right triangle base and with added steps and crossed to the left circle (place) starting. This way, round trip, it is consider a complete route. The beginners will go twice (12 sides of a triangle), and the advanced three times, contretemps.

4. The results

Table 1

Dynamic indices of specific physical preparation for the subjects gripped in research

Iss. No.	The control samples	Group of subjects	Initial testing	Final testing	t	P
			$\bar{X} \pm m$	$\bar{X} \pm m$		
1.	Running speed 30 m. (sec)	E	5,08 ± 0,02	5,02 ± 0,01	3,53	< 0,01
		C	5,09 ± 0,03	5,07 ± 0,02	1,00	> 0,05
	t; P	E-C	0,28 > 0,05	2,50 < 0,05	–	–
2.	Long jump with elk from a standstill, (cm)	E	176,31 ± 3,22	188,67 ± 3,00	3,85	< 0,01
		C	178,08 ± 3,24	179,45 ± 3,15	1,02	> 0,05
	t; P	E-C	0,39 > 0,05	2,12 < 0,05	–	–
3.	Handball throwing by 3 steps elk. (m)	E	22,52 ± 0,38	23,77 ± 0,33	3,38	< 0,01
		C	22,20 ± 0,40	22,67 ± 0,37	1,17	> 0,05
	t; P	E-C	0,58 > 0,05	2,24 < 0,05	–	–
4.	Move in the triangle. (sec)	E	17,94 ± 0,52	16,09 ± 0,45	3,70	< 0,01
		C	17,98 ± 0,53	17,51 ± 0,50	0,89	> 0,05
	t; P	E-C	0,05 > 0,05	2,12 < 0,05	–	–



Graph 1. *Dynamic indices of specific physical preparation at final testing*

5. Conclusions

The results highlighted by the experiment of the present research point out the most important sporting progress for specific physical preparation, occurred in the experimental group. The objective statement is due to the statistical processing of data and the analysis of the scores obtained by comparing the two groups, for the two test points and also by independent analysis of each group developments.

It finds the same dynamic materiality threshold for all samples tested, $P < 0.01$ expressing the rate of progress for the experimental group, $P > 0.05$ for the control group and $P < 0.05$ for the comparative analysis of groups to final testing.

Although the initial testing between the two groups, there were no statistically significant differences ($P > 0.05$), towards the end of the study, the experimental group was differentiated relevant, obtaining in all samples evaluated superior sports performance.

Given all the above, it can say that selection of handball players based on a dominant model of the cerebral hemispheres lead to getting better results to the specific physical preparation and further to better performance on other components of the preparation of sports training. In this regard are highlighted real conditions for learning and manifestation better technical processes specific for handball game and subsequent application accurate and effective tactical combinations.

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