

THE DYNAMICS OF COORDINATIVE ABILITIES ACCORDING TO AGE, GENDER AND SCHOOL PERFORMANCE AT SECONDARY SCHOOL LEVEL

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Abstract: *Motor quality skill (coordinative ability) is important in physical education in secondary school because it develops fundamental motor skills, improves coordination of movements, develops confidence in one's own abilities, supports the learning of complex sports, strengthens cognitive skills, promotes an active and healthy lifestyle, forms a positive social environment within physical activities, especially those in teams, which involve coordination and collaboration, encourages teamwork, mutual respect and communication, fundamental aspects in the development of interpersonal relationships and social skills of students. The present study represents transversal research on the level of development of coordinative capacities at the level of secondary school students. Such studies are multiple, but we believe that the influence of varied motor activities, access to different forms of movement determines a multilateral motor development of students. Also, reporting the results obtained on school performance could favor the orientation of schoolchildren towards the practice of sports activities. 6 approved tests were selected and a number of 156 schoolchildren were evaluated. The results obtained are very heterogeneous at the horizontal level, but an upward trend can be observed in the transverse plane.*

Key words: *coordinative ability, students, gymnasium, school results.*

1. Introduction

Coordinative capacity is fundamental in the physical education lesson, especially in the secondary school cycle, because it influences the physical and motor development of students. This refers to the ability to coordinate body movements in an efficient and harmonious manner,

requiring both physical and cognitive processes. Motor quality skill (coordinative ability) is important in physical education in secondary school because it develops fundamental motor skills, improves coordination of movements, develops confidence in one's own abilities, supports the learning of complex sports, strengthens cognitive

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skills, promotes an active and healthy lifestyle, forms a positive social environment within physical activities, especially those in teams, which involve coordination and collaboration, encourages teamwork, mutual respect and communication, fundamental aspects in the development of interpersonal relationships and social skills of students. Therefore, the skill is not only a technical aspect of physical activity, but also a key component in the personal and social development of students, with a significant influence on their long-term physical and mental development. Dexterity (coordinative ability), although it is considered a multilateral motor quality, it is insufficiently researched from the point of view of the content and the way of improvement. Authors Scarlat E. and Scarlat M.B. [14] define the skill motor quality as "the body's ability to perform complex motor actions performed with high efficiency in various training conditions and often in adverse conditions"; Smîdu N., [15] defines the coordination capacity as a psychometric quality, which is based on the correlation between the central nervous system and the skeletal muscles during movement. In the view of the specialists in the field that aims at the problem of the development of motor quality, it was found that, in its composition, "several structural elements enter such as: coordination, mobility, suppleness, balance, orientation in space, mobility of attention" [14], and the coordination capacities are inconceivable without the physical factors of performance: strength, speed, resistance and their complex involvement in the performance of movement [1]. Mechanisms regulation of coordination skills are complex because they are

mentioned within the complex of activities of various analyzers, such as autonomic organs, nervous and muscular system [9]. Some authors believe that the action of developing coordinative capacities has a special dynamic depending on age in the process of biological development. Coordinative capacities support the solution of phases that require prompt and rational action, being important in motor movements but also in avoiding accidents, being the basis of all types of motor learning, especially the sensory-motor one [5]. It was found that, for the development of coordination, an important role is played by genetic predisposition. Therefore, less skilled children will probably never show the propensities of naturally coordinated children, no matter how much they practice, but there is always room for improvement if they are given specific stimuli [8]. involve interactions between multiple body parts and/or with manipulative objects to achieve goal-directed behaviors, requiring precise timing, temporal and spatial judgment, involving high-level perceptual and cognitive information processing [6]. Optimal motor skills are believed to be influenced by the performance of motor coordination due to the direct manipulation of an object (ball) with the upper and lower limbs. This feature highlights factors of increased complexity to contribute to motor and coordination competence research [11]. In the view of some authors, recent findings highlight the significant role of coordination exercises in terms of improving academic performance, the fact that cognitive performance seems to be influenced by bilateral coordination exercise showing benefits even after short periods of

exercise, especially in tasks involving executive function. Coordinative exercise of low and moderate intensities can also increase visual perception, attentional resources, working memory, and shorten the time required for neurocognitive processing [7].

2. Material and Methods

The present study aimed to evaluate secondary school students from two rural schools with a total of 106 students, of which 54 were boys and 52 were girls. The students were evaluated through 6 coordination tests carefully selected from the international literature in order to cover a wide range of abilities [17]. Thus, test 1 evaluates orientation in space and speed of movement (it is a test used in school evaluation in the German system) and consists of completing in the shortest possible time a route that involves rolling followed by avoiding an obstacle, bending and jumping.

Test 2, or the square test, tests orientation and balance and consists of jumping across a square, divided into smaller, randomly numbered squares.

Test 3, hand-eye coordination represents the number of throws of a tennis court against a smooth wall. It is thrown with the right hand and caught with the left hand and vice versa. Test 4, for eye-foot coordination, is like the previous test except that a volley ball is passed with the right foot into a wall, the left foot is intercepted and then the movement is resumed in the opposite direction.

Test 5 tests dexterity and hand-eye coordination and consists of throwing a cue that is held by two other hands. Throwing and turning is done in unit of

time and can be done 180 degrees or 360.

Test number 6 highlights hand-eye coordination and speed of segmental movements. The subject must place the left arm (right-handed) over the right and vice versa, in well-defined spaces, in unit time. Students were assessed with the same equipment and under the same conditions. The research started from the idea that coordinative capacities are very varied and difficult to predict from one age to another and even from one gender to another. The study also aimed to identify the existence of a relationship between the test results and academic performance. This hypothesis would facilitate the selection of students to practice sports with a high degree of technicality based on school performance. The need for such research is based on the need to know the potential of students' motor skills that have the nervous system as a component.

3. Results and Discussion

The results obtained from the tests carried out highlighted the variety of results. Thus, Fig. 1 shows the dynamics of the results of the 6 tests depending on the age level. At test no. 1 the difference of the averages, following the statistical calculation, shows us that all the classes fell into close values with slight differences in the smaller classes. These values have also been identified in other studies [16] and highlight the adaptation capacity of the body. The only explanation would be given by the high participation capacity specific to young ages. In test 2, in which the students had to cover a route in the shortest possible time and which is based on the spirit of observation, consistently better results are obtained

from one class to another, but insignificant from a statistical point of view. In test 3 there is a constant and significant increase from one level to another from the 5th to the 8th grade although it does not require strength or speed and highlights the importance of the throwing and catching exercises present in the school physical education lesson [13]. Test 4 maintains the previous trend of growth from one level to another with an obvious jump from 5th and 6th to 7th and 8th grades. In test 5, where dexterity is highlighted, the same level is found at all levels with a slight negative gap in the 5th grade.

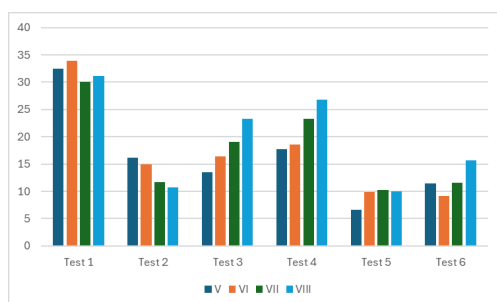


Fig. 1. *The dynamics of the results depend on the classes*

This is since the test is based on movements unknown to the students and highlights the reduced ability to adapt. The constant and low level of these results should give thought to specialists who turn physical education lessons into a monotonous activity from the point of view of diversifying the types of movements [12]. In test 6, which requires attention and speed, the phenomenon from the previous test is repeated, with a slight, insignificant increase in the 8th grade. The results obtained in the last two tests highlight the tendency of teachers to attract students to the lesson by practicing their favorite activities (usually the same:

football for boys and handball for girls) and not by diversifying the types of movement [2]. Reporting the results obtained at the level of girls and boys (Fig. 2) revealed the same diversity of results, sometimes expected, such as test 4 where eye-foot coordination is appreciated. This result was expected if boys are encouraged both in the family and at school to play football [4]. The result of this behavior is highlighted in the values obtained in the evaluation. Also, higher results, but not statistically significant, were obtained by the boys in test 3 (hand eyes).

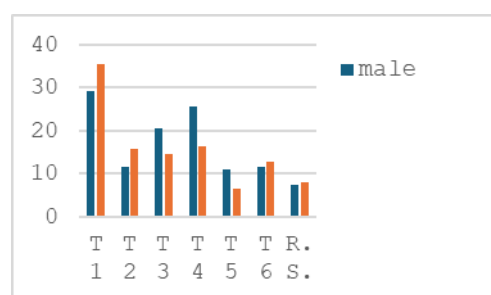


Fig. 2. *The dynamics of results in terms of gender*

This aspect is based on the preoccupations of childhood, namely dynamism and the increased craftsmanship manifested and present more in boys. Girls scored statistically insignificantly better on tests 1 and 2 and demonstrated better balance and speed skills over short distances, increased attention, and better agility. In test 6, a very close result is found between girls and boys because only attention skills are needed more than motor skills [10]. From the perspective of school results, the two categories of students register a very close result. This result represents the evaluation of many teachers during a school year and has a high degree of veracity.

4. Conclusions

The values obtained highlighted the diversity of the results, the unpredictability from one age to another and from one gender to another. The statistical calculation highlighted the fact that there is no correlation between the results obtained in the tests performed and the school performance, although the coordinative capacities have as a determining factor the quality of the central nervous system. These results were determined by a common quantitative assessment, but we aim to determine the level of correlation on an individual level. Another conclusion that can be formulated following the evaluations is the reduced ability of students to learn new movements. This is caused by the limitation of the physical education teacher in designing and leading physical education lessons. We believe that the low level of motricity is also caused by the poor material base in the schools, the lack of gyms at the two schools, the conduct of physical education lessons in improper conditions, in ordinary classrooms. The hypothesis that a student who has good school results is also good at sports with high technical levels was not confirmed. This aspect confirms the concept that most beginners in a sport learn the movements, technical procedures without fully understanding them.

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