

**THE MINISTRY OF EDUCATION, RESEARCH, YOUTH AND
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SUMMARY OF THE DOCTORAL THESIS

**DYNAMICS OF MOTOR AND
PSYCHOMOTOR FACTORS FOR
STUDENTS IN THE ELEMENTARY
SCHOOL**

**SCIENTIFIC COORDINATOR:
PhD. CORDUN MARIANA**

**PhD Student:
GOZU
BOGDAN**

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Considering its particular objectives, psychomotricity offers to children both benchmarks, as well as the proper frame for developing and perfecting a system of skills, through which they can act effectively and can adapt in optimum conditions to requirements imposed by the environment in which they operate. This requires, from those involved directly and indirectly in the instructive - educational process, the understanding of internal mechanisms underlying psychomotor phenomenon and identifying the main ways of assessing its various components, at a given moment, for the purpose of highlighting any deviation from the normal ontogenetic course of the child.

A correct and specific approach of all psychomotor components, which take into account both the age and the established training objectives, will be reflected in the child behavior by acquiring essential acquisitions, which will constitute the premises by passing to the upper stage of development and acquiring new behaviors.

But, for fulfilling this goal, persons involved, on various levels, in the child's education should be very familiar with its level of psychomotor development. In this respect, an evaluation centered on these issues, using specific instruments as valid and objective as possible constitutes a condition urgently necessary.

The present paper, through its contents and tasks, brings a series of current elements in the field of physical education, thus proposing to approach a field (of psychomotricity), insufficiently researched and that, especially on national level, only partially clarifies the problem of the theoretical framework and of the practical intervention. Most works which approach the topic of the psycho-motor phenomenon refer to the specific intervention on its various components, as subjects are, most times, institutionalized children or who have already been diagnosed with various psycho-motor conditions. Therefore, for the research part, the present work has proposed a selection of children, from the urban and rural environments, active participants in the instructive - educational process and who, according to information received, do not manifest any sort of deviation from a normal psychomotor development.

Another element of timeliness is represented by the age of children subjected our evaluation. The documentation undertaken, we can say that during the first education cycle, very few research relating to the general psycho-motor component, as it is mostly oriented to its isolated aspects. Moreover, our undertaking benefits, for the moment, of a proper environment, both in connection with the assessment, as well as with implementing certain measures, as a result of the obtained feedback. This is due to changes of the Romanian education system, as at the level of the primary cycle, children benefit from the presence of the specialized teaching frame in applying the specific syllabus of physical education.

The newest and most original element of the work is represented by the instrument of evaluation chosen for performing preliminary study number 2 and experimental research. Due to its qualities (validity, fidelity, objectivity), the Bruininks-Oseretsky battery of tests has been used frequently by specialists in various fields ever since 1978, benefiting from a national and international recognition. The improved version of this battery, BOT- 2, issued in 2005 and acquired in 2009 for serving to our work's objectives, has been used for the first time in Romania on this occasion, offering a series of information particularly important and timely relating to the tested subjects. Whereas its acquisition and use involve a certain level of skills from the evaluator (in this case B, Q1 or Q2 - according to skills required by the supplying company, i.e. Pearson Assessment & Information Group), after the careful study of the sent file, we received skill level B, i.e the right to acquire and use of the Bruininks-Oseretsky battery of tests, Second Edition, in Romania.

The doctoral thesis is structured in three parts, each of them contributing, through its own content, to the appropriate and logic performance of the undertaken research. The first part of the work, dedicated to theoretical and methodological and conceptual substantiation, is constituted of five chapters, as follows:

- Introduction;
- Psychomotricity - basic psycho-behavioral component;
- Particularities of the young school age (6/7 - 10/11 years);
- Taxonomies of the psychomotor field;
- Theoretical considerations regarding the assessment of motor and psychomotor factors for students of the primary cycle.

Through their content and structure, chapters listed above contribute to achieving the objectives specific to our scientific undertaking, providing necessary theoretical basis necessary for conducting preliminary studies and experimental research.

Chapter 1 is destined to the presentation of the main reasons for choosing the research theme, and the degree of actuality, purpose and significance of the present work, all in the context of the current stage reflected in specialized national and international literature.

Chapter 2 describes, in a particular manner, the main elements defining the concept of psychomotricity and the specific objectives substituted to it, and the basic components from the psychomotor field, with direct influence on its evolution during the ontogenetic development of the individual.

Having regard to the age of subjects selected for research, I have considered necessary and timely the implementation, within *chapter 3*, of a detailed presentation of the particularities of young school age (6/7-10/11 years). In addition to introductory aspects, emphasis was placed on the specific characteristics of this age period, primarily those related to adapting to the school environment, physical development and mental development, development of language and of personality.

The problematic of pedagogical objectives and their relation with the purposes and finalities of the instructive - educational process represented the starting point of numerous investigations and attempts of clarification, and also the functions and procedures for realizing them efficiently.

From the point of view of the psychological nature of capacities which they cover, educational objectives have been divided into three major taxonomic areas (Diaconu, M., Jinga, I., Ciobanu, O., Pescaru, A., Păduraru, M., 2003) : *the cognitive field* (it regards targets aimed at acquiring knowledge and forming intellectual capacities to operate with such knowledge), *the affective field* (includes objectives related to forming beliefs, attitudes and feelings), *the psychomotor field* (aimed at acquiring some motion capabilities and manual operations) and *the perceptive field* (this taxonomy was subsequently published, being perceived as a complement of the psychomotor field).

The psychological approach of the manner of ranking performances which are possible to be achieved by students, in all these areas has led to the emergence

of so-called "taxonomies of the educational objectives". Within each taxonomy, the educational objectives are classified as "behavioral classes", which differ from one field to another, according to the operational complexity involved or to the psychological procedure which it is based on. Therefore, *chapter 4* of the present work is substituted directly to the requirements of a logical structure of the theoretical substantiation part, by presenting the main taxonomies, specific to the psycho-motor field, and of the main defining elements which characterize their contents.

The last chapter within the theoretical, methodological and conceptual substantiation part of the work represents a logical undertaking, necessary for the following stages of research, judging by the fact that it brings clear explanations concerning the concept of assessment and its implications in the instructive-educational process specific to the field of physical education. The end of *chapter 5* is dedicated to the description of main trials and tests used to assess motor and psychomotor factors in pupils in primary cycle, both in accordance with school syllabus, as well as outside its provisions, thus constituting premises of a subsequent choice of Bruininks-Oseretsky battery of tests, Second Edition, as a modern and efficient tool for assessing the above-mentioned factors, within preliminary study number 2 and in the experimental research.

The second part of the work comprises two chapters, afferent to the two preliminary studies carried out for the purpose of underlining the suitability and efficiency of use of trials for psycho-motor assessment of pupils in primary cycle. For performing preliminary study number 1, in School no 113 - "David Praporgescu ", in 6.10.2008-14.11.2008, on a number of 87 pupils in grades I to IV, has gone from the idea of verifying the possibility of implementing the trials or tests of psychomotricity in students in primary cycle, in the current context in which physical education is reflected in this stage of study. At the same time, the feedback of subjects was monitored, following the administration of these trials, feedback which is essential at this stage of research, because through it we can understand the suitability of choosing certain trials or tests, and also the optimum techniques and procedures for applying them in the subsequent research. Although in specialized literature we also treated the problematic of psychomotricity at the level of this age stage, none of the consulted works was not made taking into

account the current conditions. We are hereby talking, in particular, about the fact that physical education at the level of primary cycle benefits, in applying the content of the syllabus, of specialized teachers.

We have opted for the use of the following 4 trials, in performing this study:

- trial for evaluation of running speed and agility (trial within the *Bruininks-Oseretsky battery of tests*);
- trial for evaluation of the strength of abdominal muscles (trial within the *Bruininks-Oseretsky battery of tests*);
- *the tapping trial* for evaluating the repetition speed (trial within the *Bruininks-Oseretsky battery of tests*);
- Harris laterality trial.

Conclusions drawn from the performance of the preliminary study number 1 have underlined the fact that teaching physical education at the level of the primary cycle, by specialized teachers represents a favorable framework for implementing various psychomotor trials or tests (isolated or integrated into the battery of tests) during subsequent stages of research. Therefore, within the preliminary study number 2, we have considered necessary and appropriate to apply the *Bruininks-Oseretsky, Second Edition (BOT-2) battery of tests*, for a complete and complex evaluation of the psychomotor capacity of pupils in primary cycle.

Preliminary study number 2 took place within the School Sports Club number 6, in the period 1.04.2009-03.04.2009, on a number of 11 subjects, pupils of classes I and II, all registered in the children groups of the club, for football. Through it we have monitored both checking the suitability of applying the Bruininks-Oseretsky battery of tests, Second Edition (BOT - 2), in order to achieve a complete and complete evaluation of pupils in primary cycle, and for identifying the main social factors which may play a determinant role in performances obtained by subjects following tests to which they were subjected.

The feedback resulted from carrying out this preliminary study has revealed the necessity and utility of using the Bruininks-Oseretsky battery of tests, Second Edition (BOT-2), in the experimental research. Also, results obtained from managing the questionnaire, have led to the conclusion according to which the sporting antecedents of the parents, family and school environment, and economic aspects, can be considered influence factors to the evolution of the psychomotor

evolution of the primary cycle student, and therefore can be taken into account in the later stage of research.

The third part of the doctoral thesis, with a specific structure, containing four chapters, reflects own contributions regarding the dynamics of motor and psychomotor factors in pupils in primary cycle. The research undertaken by us, through its contents and its manner of approach, intends to underline a series of information for facilitating the optimum understanding of dynamics of motor and psychomotor factors in relation to the age order of subjects, their level of involvement within the general psychomotor capacity, and their specific manifestation in certain training conditions (urban/rural).

Also, within the experimental research we propose to promote the Bruininks-Oseretsky battery of tests, Second Edition, as a valid and objective instrument for assessing the psychomotor phenomenon. Through it, the assessor benefits from essential information regarding the normal psychomotor development in children, both for various components, and for the general psychomotor capacity, thus the test constituting a major benchmark within assessment, selection and diagnosis processes for various deviations from the normal course of development. Therefore, providing its usefulness during experimental research, the Bruininks-Oseretsky battery of tests, Second Edition, can constitute, being fully implemented or applying just a few items, an evaluation instrument extremely useful for the teacher, which, associated with other trials and tests, may lead to a more effective instructive - educational process.

In order to conduct the research experiment, 40 subjects (20 boys and 20 girls) were selected, pupils of classes I to IV, which come from the urban and rural environments.

Within the urban environment, of the 20 selected subjects, 15 are pupils of Elementary School number 113 - "David Praporgescu ", while the remaining 5 are registered in Elementary School number 162.

The sample of subjects in the rural environment consists of pupils of the "Simion Bărnuțiu" Elementary School, locality of Tiur, Alba County.

Regarding the organization itself of research we must highlight, from the outset, the difficulties encountered during its completion. These difficulties were due, firstly, to reticence manifested, both by parents, and by persons involved in

instructive-educations and decision-making process within education institutions, regarding testing, even for ascertaining purposes, of pupils in primary cycle.

A second big difficulty we have encountered during the development of the research experiment was about the location in which the test sessions were to be organized, applying the Bruininks-Oseretsky battery of tests, Second Edition, requiring a series of specific conditions related to space, duration and ensuring an optimal climate for testing.

The educational institutions in which the research experiment was conducted were chosen, on the one hand, because they fulfilled the above-mentioned requirements, and on the other hand, due to interest expressed by parents, teachers and decision-makers from within these institutions, for knowing different psychomotor aspects. In this respect, also having regard to the age of subjects, following our requests, we have received the written consent of parents and of teaching institutions, represented by their manager, regarding the proposed psychomotor assessment tests . The actual assessment of students took place in the following locations:

- *Urban environment:* Gym Class of Elementary School number 113 - "David Praporgescu" and "Panduri" Gym Class of the Department of Physical Education and Sports, within the University of Bucharest.
- *Rural environment:* The Gym Class of the Blaj School Sports Club.

Having regard to the relatively large duration (45-60 minutes) of a test session on a single topic and taking into account the existing guidance and suggestions in the instruction manual of the battery of tests, and also the reaction from pupils during testing, the evaluation itself was divided into two separate session, in order to avoid an accumulation of fatigue on their part and obtaining erroneous results. For shorting the time for implementing a battery of tests, before each session, the test location was organized so that all disturbing factors are removed, as it is known that going through a specific factor requires a lot of attention and focus on the part of the assessed person. Also, before the start of the assessment itself, its contents was submitted to subjects as a series of amusing and provocative activities, thus managing to create an atmosphere proper for developing the test sessions in optimum conditions.

The objectives and tasks specific to the psycho-pedagogic, assertive experiment, proposed for the research part are in a close relationship with the two particular hypotheses, formulated as follows:

Hypothesis 1: The dynamics of motor and psycho-motor factors within the general motor component influences the relation between chronological age -motor age.

Hypothesis 2: Conducting lessons of physical education, in the primary cycle, by specialized teachers, according to a unitary syllabus, modifies the level of motor and psycho-motor development level in children, according to sex and environment of origin.

The verification of statistical hypotheses was made based on the types of derived scores (scale score and standard score), obtained through software BOT-2 ASSIST™, Scoring and Reporting System by converting raw scores achieved by pupils during testing.

The scale score allowed reporting of research results to the 8 subtests specific to the chosen assessment instrument (*fine motor precision, fine motor integration, manual dexterity, upper-limb coordination, bilateral coordination, balance, running speed and agility, strength*), while through the standard score we have realized the reporting to the four motor components (areas) specific to the battery of tests (*fine manual coordination/ fine manual control, manual coordination, body coordination, strength and agility*) and also the *total motor component*.

In order to verify the first hypothesis of the research, through multiple regression analysis, first, we have proceeded to determining, in dynamics, of the global influence of motor and psycho-motor factors considered over the dependent variable "*total motor component*", of the percent degree of influence of each factor on it, and also of the regression equation, as element of prediction of the dependent variable. Also, were considered the residual values and standard errors for highlighting the validity of prediction obtained with the determined regression equation. Based on the performed analysis, the following particular aspects can be outlined:

- the regression model is valid, aspect certified by the presence, in the regression equation, of at least one coefficient different from zero;

- the influence of prediction factors over the total motor component is statistically significant ($P = 0.000001$, $P < 0,05$);
- 96.50% of the total motor component is influenced by the ascertained prediction factors and only 3.50% of other factors.
- *the weight of prediction factors in the process of influencing the total motor component is presented as follows: fine motor precision (28.1%), fine motor integration (6.9%), manual dexterity (29.2%), upper-limb coordination (17.6%), bilateral coordination (3%), balance (7.2%), running speed and agility (4 %) and strength (4%).*

Based on the specific conclusions of each subtest, we can draw, necessarily, a general conclusion, according to which, **for characteristics fine motor precision, fine motor integration, manual dexterity, upper-limb coordination, bilateral coordination and balance, hypothesis 1 of the research is confirmed. For the two other characteristics subject for statistical analysis, i.e running speed and agility and strength, the hypothesis of void is accepted, and the alternative hypothesis is rejected.**

In order to verify hypothesis number 2 of the research, the statistical analysis was oriented to the discovery of existence of statistically significant differences between the arithmetical means of parameters measured by using the scale score and the standard score, for the lots of pupils from urban and rural environments, and also for lots of girls and boys. Thus, based on the conclusions specific to subtests and analyzed motor components, one can affirm that, **both on the level of each subtest, and on the level of the five motor components subject to statistical analysis, the hypothesis of void is accepted, and the research hypothesis is rejected.**

Regardless of conclusions specific to the experimental research, information gathered through the statistical processing of results achieved by students in carrying out the research experiment also lead to the formulation of theoretical conclusions. Through their particular mode of formulating these conclusions, it is aimed at creating a general picture over our own research, emphasizing also the consistency and originality of its content.

- A result of the specific report between the psychical and motor factor, psychomotricity represents a basic psycho-behavioral component, with

special influences in the ontogenetic development of individuals. A major importance for the field of physical education and not only, psychomotricity offers to children, in a systematic and correct approach of its particular components, the favorable frame for its effective adapting to the requirements of the school and social environment.

- The insufficient experience in motion, characterizing more and more children entering the school environment, as a result of inadequate psychomotor incentives in the pre-school period, doubled by more and more accentuated changes, requests and rigors of daily life, impose reconsidering and restoring in the spectrum of theoretical and, moreover, practical concerns of the problematic of knowing the level of psychomotor development in children, and concrete possibilities for optimization.

- The achievement of these objectives truly gains utility and effectiveness, to the extent to which it occurs in the age periods in which specialized intervention, in any direction it is manifested, presents maximum chances of success. If we add to all this the option to use modern and efficient assessment tools, and also the presence of the specialized teacher, who ensures competence requirements in applying the methodology subordinated to these objectives, we can have the certitude of viability of this approach.

- Using, for the first time in Romania, the Bruininks-Oseretsky battery of tests, Second Edition, within an experimental research, represents, except for an original approach and a major opportunity of obtaining some extremely valuable data relating to a series of psychomotor features of pupils in primary cycle. This information, analyzed, interpreted and presented in the form of written reports, issued through the software specific to the battery of tests, can prove to be of great significance for the physical education professor and for the other persons involved, directly or indirectly, in the instructive - educational process, representing indispensable components of any educational strategy based on competence and professionalism.

- The present work, through its contents and specific objectives, approaches in an original way all previously mentioned aspects, both regarding the used assessment instrument and assessed components, as well as regarding the age of subjects selected for the research lots. Through this, our scientific undertaking

fulfills the role of a clear and solid benchmark for further research performed in this respect.

Based on the theoretical and experimental conclusions drawn from performing preliminary studies and experimental research, we consider necessary and appropriate to formulate the following specific recommendations:

- Orienting our own scientific undertaking towards the other age stages, in which specialized intervention is urgently needed, both on formative level, and well as for diagnosing certain differences arising in the sphere of ontogenetic development of children. We are, therefore, referring, in particular, to the pre-school period and the one of the gymnasium study cycle, periods when the most important psycho-behavioral acquisitions are realized.

- Initiating wider subsequent researches, which will cover various aspects relating to the psychomotor development of pupils in the primary cycle and whose results will allow formulating valid conclusions at regional and national levels.

- Improving the content and methodology of the instructive - educational process by promoting the Bruininks-Oseretsky battery of tests, Second Edition, as valid and objective instrument for the assessment of the psychomotor phenomenon and introducing it, as a whole, or by selecting certain items, within assessment trials specific to different education cycles.

- The adjustment and optimization of methodology for implementing the physical education syllabus on the level of primary cycle, considering the results obtained by the present research, especially those concerning the specific influence of the main motor and psychomotor factors over the total motor component.

- The systematic approach over developing psychomotricity, at the level of primary schooling, as specific objective of physical education, having regard to its importance, and also the presence of the specialized professor in applying the physical education syllabus.

- Achieving certain case studies oriented towards the discovery and emphasis of causes that lead to the emergence of various adjustment problems of students to the requirements of the instructive - educational process, especially in the field of psychomotor manifestations.

- Modern approach of sports training, using the Bruininks-Oseretsky battery of tests, Second Edition, individually or complementary to other trials or tests, within the assessment component specific to the sports training, for determining the level of manifesting different motor skills specific to a sports discipline.
- Promoting the Bruininks-Oseretsky battery of tests, Second Edition, as an important indication in the initial selection process for children, and orienting them towards practicing certain sports fields.