



- University Students, Uludağ Üniversitesi Eğitim Fakültesi Dergisi, 23 (2), 399-413.
- Li, K.K., et al., 2012, An Examination of Sex Differences in Relation to the Eating Habits and Nutrient Intakes of University Students, J.of Nutrition Education and Behavior, 44 (3), 246-250.
- Lin, K.G., Cobiac, L., Skrzypiec, G., (2002), Gender Differences in Eating Behavior and Social Self Concept Among Malaysian University Students, Mal. J. Nutr., 8(1), 75-98.
- Mason, S.L., Savage, G.P., 1997, Breakfasting Habits Among University Students, Proceedings of the Nutrition Society of New Zealand, 22, 102-108.
- Orak, S., Akgün, S., Orhan, H., 2006, Investigation of Nutritional Habits of Süleyman Demirel University Students, S.D.Ü. Tıp Fak. Derg. 13 (2), 5-11.
- Ortega, R.M., et al., 1997, Concern About Nutrition and its Relation to the Food Habits of a Group of Young University Students from Madrid (Spain), Zeitschrift für Ernährungswissenschaft, 36 (1), 16-22.
- Perez-Rodrigo, C., Aranceta, J., 2001, School-based Nutrition Education: Lessons Learned and New Perspectives, Public Health Nutrition, 4 (1a), 131-139.
- Rakıcıoğlu, N., Akal Yıldız, E., 2011, Energy and Nutrition Intake and Food Patterns Among Turkish University Students, Nutrition Research and Practice, 5 (2), 117-123.
- Sakamaki, R., et al., 2005, Nutritional Knowledge, Food Habits and Health Attitude of Chinese University Students-a cross sectional study, Nutrition Journal, 4:4 doi:10.1186/1475-2891-4-4.
- Sevindi, T., et al., 2007, The Evaluation of the Nutrition Habits Among the Students of Physical Education and Sport High School Department of Gazi University, TSA, 11 (3), 77-90.
- Vançelik, S., et al., 2007. Related Factors with Nutritional Habits and Nutrition Knowledge of University Students, TSK Koruyucu Hekimlik Bülteni, 6 (4), 242-248.
- World Health Organization, 2007, Prevention of Cardiovascular Disease: Guidelines for assessment and management of cardiovascular risk. World Health Organization, Geneva.
- Yıldırım, I., et al., 2011, Nutritional Habits of Physical Education and Sport High School Students of Afyon Kocatepe University and Factors Affected the Nutrition Habits, International Journal of Human Sciences, 8 (1), 1375-1391.
- Yılmaz, E., ÖZKAN, S., 2007, Investigation of Nutritional Habits in University Students, Fırat Sağlık Hizmetleri Dergisi, 2 (6), 87-104.

Science, Movement and Health, Vol. XIII, ISSUE 2 supplement, 2013
September 2013, 13 (2), 551-557

ASPECTS ON THE MOTOR AND PSYCHOMOTOR DEVELOPMENT OF THE CHILD WITH INTELLECTUAL DISABILITIES

TEODORESCU SILVIA¹, POPESCU OFELIA¹

Abstract

Purpose. To highlight aspects on the motor and psychomotor development of the 6-7 years aged children with intellectual disabilities.

Methods. Bibliographic study, observation method, measurement and assessment methods, statistical-mathematic method.

Content. Investigation of the bodily scheme, general coordination level, segmental and intersegmental coordination levels, followed by the design and implementation of the kinetic stimulation programmes in view of educating the bodily scheme, the spatial-temporal structuring, organization and orientation, favoring the involvement of the child in different motor experiences.

Conclusions. The child with intellectual disabilities shows disorders at bodily scheme, perceptive-motor development and coordination levels, but properly stimulated, he/she can reach significant progress in psychomotor and motor fields.

Keywords: child with intellectual disabilities, bodily scheme, coordination.

¹National University Of Physical Education And Sport, Bucharest, ROMANIA
Email: teo.silvia@yahoo.com



Introduction

Motor and psychical-motor development of the child with mental disability represents a very complex process, led by own and special laws. The analysis and in-depth knowledge on such individuals is a must for any educational action which should consider the child as a bio-psychic-social entity.

The motor development and the psychic-motor development, although they seem to be similar, refer to distinct aspects of the child development (Rigal, 2008). The first refers to the development of the motor skills of the child in growth period, which means that the motor education is part of the physical education and addresses the consolidation of the motor control of the child and the improvement of his/her motor coordination. The motor difficulties occur when the child is required to voluntarily and consciously perform some actions. Difficulties are not related to performing the movement itself, but to the efficiency of such movement as determined by the way information is received and interpreted and by the quality of the answer. Hence, this is a complex process, corroborating the motor forces with the psychical ones to the end of performing the action, such process involving also the perception, sensorial and intellectual functions, representing in fact the psycho-motority. This characterizes the cognitive development in relation with the motor actions, during the first years of the child life. The motor actions and their result are the source of perceptive information based on which the child conceptualizes more or less complex and abstract notions, reason for which such information represents the essence specific for the psychomotor education. The action required to the subject to actively and consciously participate leads to awareness.

„Investigation of psychomotor performance of the child with mental disability starts from the comparison of such performance with the performance achieved by a non-disabled child. In most of the cases, frequency and severity of psychomotor difficulties grow directly proportionally with the severity of the mental disability” (Radu, Ulici, 2003).

Every child has his/her own development rhythm and unique grow and development pattern, for this reason the motor coordination difficulties children faced with being heterogeneous and found in different situations as when jumping, when maintaining the balance by supporting on palms, when using the teeth brush, when tiding the shoe laces or when copying a square. The varied association of the mental disorders, sensorial-perceptive disorders and psychic disorders at the children with intellectual disabilities defines a conduct specific to each individual, characterized by the following under-capacities, incapacities and difficulties, forming the psychomotor deficiencies (Albaret, 2004, Păunescu, Mușu, 1990):

- lack of strength and low muscular tonus which can cause difficulties in maintaining a correct body posture, favoring the installation of fatigue;
- lack of coordination between the left part and the right part of the body and difficulty in body ax displacement;
- difficulty in executing the trunk rotation with the balance maintenance;
- discomfort and hesitation when executing a familiar task because the child must think at every movement (lack of anticipating ability);
- psychomotor instability;
- insufficient understanding of spatial concepts (direction, location) and temporal concepts;
- difficulties in learning complex activities as dressing or walking by bicycle;
- tendency to confuse hands with fingers;
- difficulties in coordinating hand-eye, with impact on throwing and catching the ball, threading beads;
- poor motor control over delicate movements, with graphic-motor difficulties (having a pencil in hand, drawing, coloring images);
- emotional disorders.

To identify the motor coordination disorders the children face with, in 1994, Dewey and Kaplan (quoted by Albaret, 2004) evaluated 102 children aged between six and ten years and eleven and half months, who were tested to assess:

- their ability to reproduce movements on order and by imitation;
- their ability to keep balance and to coordinate their movements (Bruininks-Oseretsky Test) ;
- their ability to perform repetitive or alternative movements;
- their academic performance.

Data analysis emphasized the existence of four groups: the first group shows disorder in all the motor abilities, the second group is characterized by lack of coordination and balance, presenting difficulties in performing the daily gestures, the third group presents poor results in execution of sequences of movements and the fourth group is formed by children presenting no disorders (Albaret, 2004).

The motor development of a child is a hierarchical and predictable process, a certain behavior of the children, sooner or latter, “deriving” from the patterns.

Coordination of movements starts from early ages and continues until the full maturity of the human being. The age optimal for potentially successful intervention is within the frame of 7 - 10 years old, when the cognitive and motor abilities support each other. At this age, the segmental coordination ability must be improved (Dragnea, Bota, 1999).

Some specialists advocate that the age between 7 and 11 years old is the golden age, when child has no



responsibilities and can freely play (Mitrache, Bejan, 2011).

In this context, the psychomotor education represents a process of learning which can be efficient if the child is aware of his/her own body, knows his/her laterality, can locate himself/herself in space, controls the time, has stability and coordinates his/her movements and gestures.

American specialists Gallahue D. (1993), Housner L. (2000) and Gower R. (2005), initiators of the *development-dedicated education*, considered that movements learning and movements-based learning are the central objective of the motor education.

The main characteristic of this orientation is represented by the adaptation of the learning content to the singularity of each subject, starting from the assumption that although the motor development is correlated with the age, it does not depend on the age. Therefore, **adequacy to individual** and not to the age stage features is the specificity of this developmental perspective.

Organization of the research

Scope

Investigation of the bodily scheme, general coordination level, segmental and intersegmental coordination levels, followed by the design and implementation of the kinetic stimulation programmes in view of educating the bodily scheme, the spatial-temporal structuring, organization and orientation, favoring the involvement of the child in different motor experiences.

Subjects

The survey was carried out within the Special Secondary School No 1 of Bucharest which has a sport hall and a kinetherapy cabinet very well equipped with apparatus, objects and materials required to carry on the training-educational process. The sample subject of the preliminary study consisted of 29 pupils intellectual disabilities and associated affections. The characteristics specific for these children are: the psychic-motor immaturity compared to normal children, the insufficient perceptive-motor development, the poor development of the complex movements (especially those of the hands and those executed based on oral indications), static and dynamic balance disorders, inefficient spatial coordination of movements, respiratory rhythm difficulties, shamble march with the legs spread, ambiguous laterality, motor slowness, deficient posture, reduced muscular control ability, movement accuracy disorders.

Methods

Bibliographic study, observation, the Bruininks – Oseretsky Test for intersegmental, upper and lower limbs coordination, as well as for general

coordination, the Body Schema Knowledge Test , statistical processing methods and data interpreting.

Body Schema Knowledge Test (Moțet, 2001, pg. 193)

Subject must correctly answer to the following orders:

Show me the eyelids! – 1point

Show me the elbow! – 1point

Show me the right thigh! – 1point

Lift the right arm and the left leg! – 1 point

Move the right leg backward and take it in the left hand! – 1 point

Touch my heel! – 1 point

Show my left shoulder! – 1 point

Show my right shoulder! – 1 point

Staying face to face with the therapist, the subject must execute the same movement as the therapist, to investigate the mirror movements.

Touch the right eye with the right upper limb – 1 point

Lift the upper right limb, flex the left lower limb from the knee joint and keep it lifted from the soil - 1 point.

Maximum score to be obtained is 10 points. It is awarded 1 point for each order correctly executed.

The test verifies the knowledge of the own body schema and of the partner's body schema, the spatial orientation and the balance.

Intersegmental Coordination Test (Bruininks – Oseretsky Test of Motor Proficiency-Moțet, 2001, pg. 195-196)

Subject must execute:

Item 1. 10 alternative and consecutive leg tapping, cutting circles in the air with the fingers = 10 points (if the subject does not maintain the rhythm or does not tap alternatively or does not succeed to cut simultaneously circles in the air with both arms, the test is considered incorrectly executed);

Item 2. 10 simultaneously tapping with the forefinger and the leg selected by the subject at own discretion = 10 points;

Item 3. 10 simultaneously tapping with the forefinger and the opposite leg = 10 points;

Item 4. Capriole jumps accompanied by synchronized movements of the arm and lower leg of the same side. 10 complete jumps in 90 seconds = 10points;

Item 5. Capriole jumps accompanied by synchronized movements of the opposite arm and lower limb. 10 complete jumps in 90 seconds = 10 points;

Item 6. Vertical jumps by clapping the palms at every jump. 5 jumps with palm claps at each jump = 5 points. Maximum score to be obtained: 55 points.

Lower limb movement coordination test

Subject stays on a straight line drawn on the soil. The line crosses the soles of the subject, dividing them into two halves: the anterior half and the posterior half. Subject must execute 20 jumps as it follows: 1 – the selected leg in front of the start line and the opposite on the rear; 2 – legs come back on the line; 3 – the opposite leg in front of the line and the selected one on the rear; 4 – coming back on the line with both legs.



For each phase correctly executed shall be given 0.05 points. The maximum score to be obtained is 10 points. The subject is required to execute 20 jumps by crossing his/her legs starting from the above mentioned position, provided he/she remains all the time on the start line, as it follows:

1 – the selected leg passes, during the jump, in face of the opposite leg and then reaches the soil; 2- coming back in the initial position; 3 – the opposite leg passes, during the jump, in face of the selected leg and then reaches the soil; 4 – coming back in the initial position. The maximum score to be obtained is 10 points.

Maximum score to be obtained is 20 points.

Upper limb movement coordination test (Bruininks – Oseretsky Test of Motor Proficiency) (Moțet, 2001, pg. 196-197)

Item 1. The subject taps the ball against the floor and catches it by both hands, 5 correct executions – 5 points (1 point for each exercise correctly executed);

Item 2. The subject taps the ball against the floor and catches it by the selected hand, 5 correct executions – 5 points;

Item 3. The subject catches by both hands the ball thrown by the partner, 5 correct executions – 5 points (1 point for each correct execution);

Item 4. The subject catches by the selected hand the ball thrown by the investigator, 5 correct executions – 5 points;

Item 5. The subject throws the ball on target with the hand selected by him/her, 5 correct throws from 5 attempts = 5 points;

Item 6. The subject touches a swinging ball by the selected hand, 5 correct attempts = 5 points;

Item 7. The subject having the arms laterally stretched must touch the nose tip by bending the arms from the elbow, eyes shut during the movement (nose-index test). For 4 correct touches (2 by each finger) shall be obtained 4 points;

Item 8. The subject must touch the hand thumb with each of the other fingers (in the following order: forefinger, middle finger) = 4 points;

Item 9. Rotation of thumb and forefinger, 5 correct rotations in 90 seconds = 5 points
Maximum score - 43 points.

Matorin Test (Grosu, 2009, pg. 98) – the Matorin test measures the general coordination and the balance and it consists of a jump on vertical with turn around the longitudinal ax of the body (to the right or to the left). For a rotation of more than 360° it is given the “very good” mark.

Findings and results

The preliminary analysis of the results obtained by the investigated subjects shows that there is no central data grouping trend because of the heterogeneity of the group, the data rank wideness being very large. This is proved also by the value of the variance coefficient.

Table 1.

Indicatori statistici	Body schema	Intersegmental coordination	Lower limb coordination	Upper limb coordination	General coordination
AVERAGE	3.821	12.32	1.571	13	85.18
AVEDEV	3.082	14.41	1.806	10.29	69.11
MAX	10	55	8	41	360
MEDIAN	2.5	2	0	10	67.5
MIN	0	0	0	0	0
MOD	2	0	0	10	180
STDEV	3.507	16.98	2.316	12.45	88.61
Variability coefficient	91.78	137.8	147.4	95.8	104

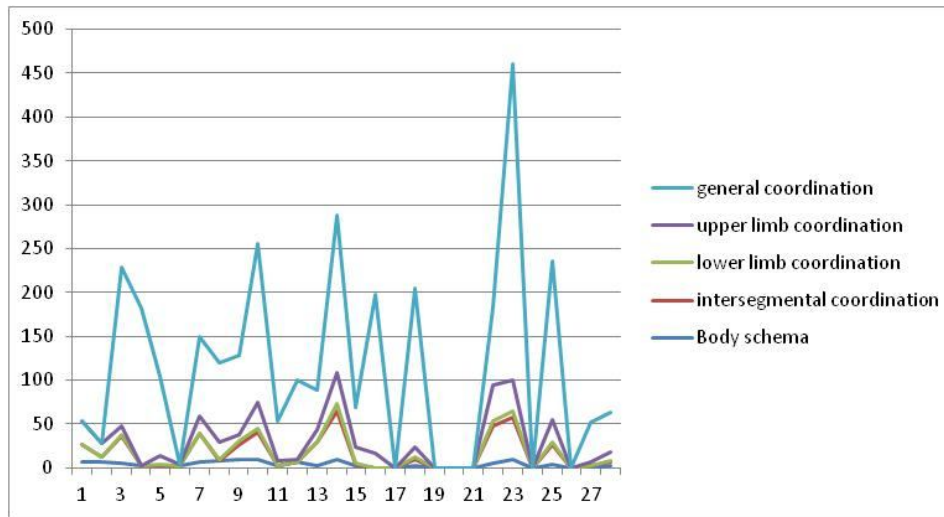


Figure 1.

Figure no 1, presenting the scores obtained by each child to the applied tests, shows that there are 8 subjects who did not obtain any score for the body schema knowledge test, 13 subjects who did not obtain any score for the intersegmental coordination test, 15 subjects who did not obtain any score for lower limb

movement coordination test, 7 subjects who did not obtain any score for the upper limb movement coordination test and 9 subjects who did not obtain any score for the general coordination test. We specify that 6 children (five boys and one girl) did not obtain any score for any of tests applied.

Variable	Coefficient de corelație Pearson
Body Schema Knowledge-intersegmental coordination	0,67448349
Body Schema Knowledge- lower limb coordination	0,683955882
Body Schema Knowledge- upper limb coordination	0,647814872
Body Schema Knowledge-general coordination	0,4905503
Intersegmental coordination- general coordination	0,585918579
General coordination - lower limb coordination	0,67983062
General coordination - upper limb coordination	0,56636864
Upper limb coordination- lower limb coordination	0,758777005

Discuss

Pearson coefficient values point out a very good positive correlation between the upper limb movement coordination variables and the upper limb movement coordination (0.758), as well as between the body schema knowledge and the lower limb movement coordination (0.683); the lowest value, namely 0.490, was recorded for the body schema knowledge – general coordination variables.

There are some researches carried out on the same category of children showing that: children with mental deficiencies represent a heterogeneous category of subjects, both in terms of somatic and motor values. These aspects are reflected on the level of motor abilities development and on the psychomotor training. (Șuță, 2010). Voinea (2011) also demonstrated significant differences between two groups, one experimental and a control one, in case of applying a psychomotor program for improving the body schema and the coordination between different limbs.

Programme of exercises for the body schema development

Normal march with the hands on the hip joints, lift of right arm while the left arm remains on the hip joint, on first sound signal, on second sound signal, coming back of the right arm on the hip joint and lift of the left arm and on the third sound signal, coming back of both arms in the initial position.

The exercise will be repeated by reversing the initial order of the sound signals (1, 3, 2 or 2,1,3 etc.)

Normal march and, on vocal order, turning and moving one step to the right/to the left.

Staying with the legs spread and the hands on the hip joints, in front of the mirror: 1-2: execution of head flexions; 5-6: bending the head to the right, 7-8: bending the head to the left.

Staying with the arms close to the body in front of the mirror: 1-4: lifts of the right arm up, through lateral displacement; 5-8: coming back in the initial position.



From staying with the legs spread and the hands on the hip joints, on vocal order, covering the left eye (ear) by the right hand, and then covering the right eye (ear) by the left hand.

From staying with the legs spread and the hands on the hip joint in front of the mirror: 1-4: twisting the trunk to the right; 5-8: twisting the trunk to the left.

From staying on the knees with the arms along the body and a ball put on the right side, on vocal order catching the ball by both hand, moving it to the left via forward, by stretching the arms, and putting it the fixed position (circle drawn on soil), then repeating the exercise to the right.

From lying on the back, with the lower limbs tripled flexed, with 5 balls put on the right side and other 5 balls put on the left side, on vocal order twisting the trunk to the right, catching the ball by both hands and throwing the ball to the left until there are no balls left on the right, then repeating the exercise for the left side.

Same exercise as the above one, on alternative orders (ball throwing to the right/ to the left).

Lateral rolling to the right and to the left from lying on the back.

From lying face down, lifting the right arm and the left leg; same exercise for the other pair of limbs.

From sitting position, kicking, on vocal order, the ball with the right leg/ the left leg

Programme of exercises intended to the coordination development

Exercises for the coordination of the arms' and hands' movements

a. From sitting position, lifting the upper limbs and lowering them until they are supported on the knees.

b. From upright position with the legs spread, with the arms at the chest level: 1-2: arms' flexions; 3-4: stretching arms with the palms toward up; 5-6: stretching the right arm straight close to the ear while the left arm remains along the body; 7-8: stretching the left arm close to the ear while the right arm remains along the body.

c. From upright position with the hands on the hip joints: 1-2: lifting the right arm in lateral with the palm oriented toward the soil, while the left arm is lifted up with the palm oriented to the right; 3-4: coming back to the position with the hands on the hip joints; 5-6 lifting the left arm in lateral with the palm oriented toward the soil while the right arm is lifted up with the palm oriented to the left; 7-8: coming back to the initial position with the hands on the hip joints.

d. From sitting position with the arms stretched forward and the palms oriented toward the soil: 1-2: orienting the palms toward up; 3-4: orienting the palms toward the soil.

Exercises for the coordination of the lower limbs' movements

a. Exercises on the ergonomic

b. March on the "treadmill"

c. From upright position with the legs spread and the hands on the hip joints: 1-2: lifting the right knee to the chest; 3-4: coming back in the initial position; 5-6: lifting the left knee to the chest; 7-8: coming back in the initial position.

d. From upright position with the legs close each to other and the hands on the hip joints, jumping as a ball.

e. From upright position, kicking the ball firstly with the right leg and then with the left leg.

Exercises for the coordination of the head movements with the eyes' movements

a. Sitting on the gym bench, moving the look from one object to another (up-down, to the right/to the left) without moving the head.

b. From upright position with the legs spread and the hands on the hip joints, twisting the head to the right and then to the left, keeping the eyes closed.

c. From upright position with the legs spread, bending the head forward and backward on different sound signals (cock sound – bending forward; hen sound – bending backward).

Exercises for the general intersegmental motor coordination

a. From upright position with the legs close each to other and the hands on the hip joints: 1: jump jack with the arms laterally stretched and then lifted above the head where a clap is executed; 2: coming back in the initial position; 3 - similar with 1; 4: similar with 2.

b. From upright position with the legs close each to other and the hands on the hip joints: 1: cutting a caper with the right leg forward and the arms laterally stretched with the palms oriented toward the soil; 2: coming back in the initial position; 3: cutting a caper with the left leg forward and the arms laterally stretched with the palms oriented toward the soil; 4: coming back in the initial position.

c. From lying on the back with the arms along the body: 1-2: lifting the left leg and the right arm; 3-4: coming back in the initial position; 5-6: lifting the right leg and the left arm; 7-8: coming back in the initial position.

Conclusions

Children with intellectual disabilities show significant disorders at the level of body schema knowledge and general, segmental and intersegmental movement coordination, which result in adverse effects on learning/executing the basic motor, stability and handling skills.

The educational programmes must focus on the use of the sensorial-motor skills and basic skills, basic movement patterns and fitness components.

The programmes for the complex stimulation of the children with intellectual disabilities must ensure the individualizing of the motor and functional requirements according to the mental age of each of the



subjects

Bibliography

- Albaret, J., M., 2004, Les troubles de l'acquisition de la coordination. Available from: <http://www.psychomot.ups-tlse.fr/Albaret2004-EdC-TAC.pdf>. Last message received on 09.04.2013 at 23:13
- Bota, A., Teodorescu, S., 2011, Orientări actuale în predarea educației fizice în învățământul primar. Editura Discobolul, București.
- Dragnea, A., Bota, A., 1999, Teoria activităților motore, Editura Didactică și Pedagogică, București.
- Gallahue, D.L., (1993), Developmental physical education for today's school children, 2nd edition. Editura Brown & Benchmark, Madison.
- Mitrache, G., Bejan, R., 2011, Dezvoltarea motoră și psihomotoră a copiilor de 7-11 ani, Editura Discobolul., București
- Păunescu, C., Mușu, L., 1990, Recuperarea medico-pedagogică a copilului handicapat mintal, Editura Medicală, București.
- Radu, D., Ulici, G., 2003, Evaluarea și educarea psihomotorității, Editura Fundația Humanitas, București.
- Rigal, R., 2008, L'éducation motore et l'éducation psychomotore au préscolaire et au primaire. Available from: http://www.er.uqam.ca/nobel/r17424/documents/Chapitre_introduction.pdf. Last message received on 11.04.2013 at 23:13
- Salvan, M., Albaret J.M., 2006, Quelle rééducation psychomotore pour le trouble de l'acquisition de la coordination (TAC). Approche Neuropsychologique des Apprentissages chez l'Enfant, 18, 164-171.
- Șuță V., 2010, Adaptarea ariei curriculare educație fizică și sport la copiii cu deficiență mintală severă, cu vârste cuprinse între 10 și 16 ani, Teză de doctorat, UNEFS București, p.230.
- Voinea, A., 2011, Optimizarea capacității psihomotrice la elevii cu deficiență mintală, Teză de doctorat, Pitești, p.198, 209.