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# ASPECTS OF COORDINATION IN MENTALLY RETARDED ADULTS

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**Abstract**

*Objectives.* Mentally retarded adults from our country are isolated, socially being conditioned by membership to a particular organization. Within the aforementioned organizations, the programs are mostly static. Having access to more dynamic programs (physical activities) may be achieved by partnering up with professional institutions either private or state owned. By doing so, I was able to start again my work with mentally challenged young adults. The main objective was to change their posture, and through the applied means and methods to improve or maintain a health condition conducive to conduct daily activities. Another objective was to identify strategies that we may use further to achieve self-independence and motor control in everyday activities.

*Methods.* The response received from the people I worked with, 4 girls and 6 boys, was extremely positive. The schedule selected for the program was 2 days a week each session one hour. The training session routines entailed mainly coordination, posture exercises and engaging games with several objects. The level of coordination, posture and the original physical condition for the group was tested with respect to the psychomotor development for the group's mental age and their physical condition.

*Results.* The feedback received from the participants and their parents/guardians was extremely positive. The tonicity and emotional state of participants directly engaged in the program are great, the parents giving a lot of credit to the time spent with these physical activities. The initial tests result shows that their motor coordination is very poor and their abilities are very low.

*Conclusions.* We intend to repeat the tests constantly, using the same parameters with the initial one, to further develop the activities required and see the improvement of their coordination abilities.

*Key words:* Mentally retarded adults, posture, health condition, self-independence.

## Introduction

The education of psychomotricity holds an important place in educational therapeutics, if we consider that mental retardation is generally associated with motor deficiency. In general the person with intellectual disability lacks of psychological equipment of the first childhood, which requires that through a systematic education to resume and complete acquisitions relating to motor and psychomotricity mechanisms forming the basis of all forms of superior intellectual activity.

Also, psychomotricity includes the participation of various psychical processes and functions that provide both information reception and proper execution of the response acts.

Studied literature does not contain researches or publications that confirm or exclude the role and effect of coordination exercises on mentally retarded adults. Researches are related to psychomotricity issues on children. In 2001 a collaborative paper (Choi, Meeuwsen, French, Sherrill, McCabe, 2001) drawn up by 5 university professors was published in America, which dealt with the problem of learning motor act and its transfer in a new situation. They tried to observe if the subjects will be able to reproduce some motor acts in the presence of new coordinates (different distance and new object) after learning them. Another approached issue was the verification of the learned things after a period of 48 hours and respectively 1 week. The study has shown that young males with mental retardation are able to learn, remember and adapt certain motor acts to some new conditions imposed. In 2010, Damian, Gevat, Stănculescu, Larion, made reference to improving the motor performance of students with mental retardation. The authors concluded the paper with the confirmation of the hypothesis according to which, by applying a dual-purpose exercise program for handling and cognitive tasks will increase the efficiency of physical education lessons on mentally retarded students. Professor Todoran (2012), approaches the training of some psychomotor behaviors in children with moderate and severe mental retardation through eurhythmy.

As noticed, the above mentioned studies relate to the topic approached in this research through the light

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of components of psychomotricity or mental retardation related to the development of motor skills.

We believe this research is of great interest since it can be a model for various institutions dealing with such subjects in the use of means specific to physical education and sport in order to develop static or dynamic coordination.

Wall (1976) in his paper 'Motor performance of mentally retarded' showed that motor skills level is determined by the stage of retardation. Thus, because of this, especially in our country, people with mental retardation do not have the possibility to perform physical activities in an organized environment.

**Methods**

I have chosen this topic based on the requests of parents of subjects included in a project that aims to improve the life quality of mentally retarded adults. The subjects of this study have started with low individual motor skills, so their parents asked for our help in gaining everyday independence. The coordination of these adults at the beginning of the project was very low, which prevented them from carrying out certain important daily tasks.

7 out of 10 subjects were able to tie shoelaces, 4 to two foot jump, 3 to play and catch the ball, in other words each of them had deficiency in terms of basic motor skills and psychomotor abilities.

This is why we planned to create a program of exercises to achieve the goals set in this research. We believe that practicing some methods for the development of general coordination in mentally retarded adults, under optimal conditions, will lead to improvement of basic motor and functionally applicative skills required for their everyday independence.

**Results**

The subjects enrolled in our research are 10 adults with mental retardation and other deficiencies as follows:

Subject no.1 - D.A. female – 32 years old, with severe mental retardation, Down syndrome, spastic tetraparesis.

Subject no.2 - P.R. female - 26, with moderate mental retardation.

Subject no.3 - G.D. female - 25, with severe mental retardation and congenital iodine deficiency syndrome.

Subject no.4 - C.N. male - 19, with moderate mental retardation, polymorphic dyslalia, febrile tonic-clonic seizures, epilepsy.

Subject no.5 - F.G. male - 32, with moderate mental retardation, dwarfism, hypotrophy, grade II disability.

Subject no.6 - O.R. male - 22, with moderate mental retardation, developmental disorders.

Subject no.7 - A.L. male - 33, with moderate mental retardation, Down syndrome.

Subject no.8 - A.E. male - 26, with moderate mental retardation, schizophrenia,encephalitis, paralytic syndrome.

Subject no.9 - N.A. male - 24, with severe mental retardation, grade I disability with personal assistant, paralytic syndrome, epilepsy.

Subject no.10 - S.A. female - 28, with mild mental retardation, schizoaffective disorder, encephalitis sequels.

The mean age of the subjects included in our study is X±Ds = 26.7±4.596 years.

Our study was conducted in the sport center of the Faculty of Physical Education and Sport, in the gym and on the fields for sports games. The onset of the research was in October 2014 when we had the first tests, and the final test was conducted in May 2015.

The sessions for motor re-education have taken place twice a week for 1 and a half hour.

We have opted for investigating specific tests of coordination with ages between 9 and 11 as it covers much better the biological age of the subjects at the beginning of experimental investigations.

Psychomotor tests for checking coordination

T1 – Ocular, manual, podal dominance, tests proposed by J. Le Boulch (Quote by Massenz, Simonetta, 2002).

T2 – General dynamic coordination – test proposed by Ozeretsky-Guilmain (Deitz, Kartin, Kopp, 2007)

T3 - Oculo-manual coordination - test proposed by Massenz, Simonetta (2002)

T4 – Postural adaptation - test proposed by Ozeretsky-Guilmain

T5 – Segmental motor dissociation - test proposed by Massenz, Simonetta (2002)

T6 – Adaptation to mental representation of static posture – test proposed by Massenz, Simonetta (2002)

Means of training. We order the exercises according to the starting position and used items.

Exercises in standing position, sitting position, while walking, running, jumping, with jump rope, ball, hula hoop, ribbon, fit ball, steppers, balance trainer, on gymnastics bench, plinth gymnastics trampoline.

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**Table 1.** Total hours for each subject

| | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Total sessions | **Total hours** |
|---|---|---|---|---|---|---|---|---|---|---|
| **D.A.** | - | 7 | 6 | 8 | 7 | 9 | 9 | 9 | 55 | **82.5** |
| **P.R.** | 5 | 8 | 6 | 7 | 8 | 9 | 9 | 9 | 61 | **91.5** |
| **G.D.** | 6 | 8 | 6 | 7 | 8 | 8 | 9 | 8 | 60 | **90** |
| **C.N.** | 5 | 8 | 5 | 8 | 8 | 8 | 9 | 8 | 59 | **88.5** |
| **F.G.** | 4 | 8 | 5 | 8 | 8 | 8 | 9 | 8 | 58 | **87** |
| **O.R.** | 5 | 8 | 5 | 8 | 8 | 9 | 9 | 8 | 60 | **90** |
| **A.L.** | 5 | 8 | 6 | 8 | 8 | 9 | 9 | 9 | 62 | **93** |
| **A.E.** | 6 | 8 | 6 | 8 | 8 | 9 | 9 | 9 | 63 | **94.5** |
| **N.A.** | 6 | 8 | 6 | 7 | 8 | 9 | 9 | 9 | 62 | **93** |
| **S.A.** | 6 | 8 | 5 | 8 | 8 | 8 | 9 | 9 | 61 | **91.5** |

**Discussion**

D.A. – in the light of the comments made by means of psychomotor sheet completed by the psychologist who permanently accompanied the group in trainings, subject no.1 falls apart, shy, has no initiative, and interacts with colleagues only if the exercises are partner exercises.

At the tests for determining the dominance (T1from table no2), the subject has manual (speed and power), ocular and podal dominance on the right side.

Psychomotor tests for coordination (Table 3.). General dynamic coordination (T2) is very poorly defined both in initial and oculo-manual segmental tests (T3). There is a higher rate of achievements for executions with favorite hand, both at throw and ground ball. At final test, at T2 and T3 we noticed an improvement in performance for both favorite and unfavorite hand.

In the fourth test (T4) the subject fails to adapt its posture in terms of sight suppression. Postural adaptation is better on the favorite side as support, managing to maintain balance for 3 seconds on initial testing and 4 seconds in the final one.

Table 2. Physical characteristics of feminine subjects

| | **Motor dominance T1** | | | | | | | | **Segmental motor dissociation T5** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Podal dominance | | Ocular dominance | | Manual dominance speed | | Manual dominance force | | Walk | | Run | |
| | R | L | R | L | R | L | R | L | IT | FT | IT | FT |
| **D.A.** | x | | x | | x | | x | | - | X | - | X |
| **P.R.** | | x | | x | | x | | x | - | X | - | X |
| **G.D.** | x | | x | | x | | x | | - | - | - | - |
| **C.N.** | x | | x | | x | | x | | - | X | - | X |
| **F.G.** | x | | x | | x | | x | | X | X | - | X |
| **O.R.** | x | | x | | x | | x | | X | X | - | X |
| **A.L.** | x | | x | | x | | x | | - | X | - | X |
| **A.E.** | x | | x | | x | | x | | X | X | - | X |
| **N.A.** | x | | x | | x | | x | | - | X | - | - |
| **S.A.** | x | | x | | x | | x | | X | X | - | X |

Regarding the motor dissociation (T5 from table no.2) subject no.1 has the same characteristics in both stages, managing on the final testing to properly execute the sequences required for 10 sec.

At the test of adaptation to mental representation of static posture (T6), on initial testing, subject no.1 manages to correctly identify only 3 postures out of

10 requested. At the final test there were 5 postures correctly identified, but the test was not valid.

P.R. – According to the psychomotor observation sheet, subject no.2 shows a very low motor level and medium-weak perceptual level. It is a shy person, who falls apart and asks for confirmation of its actions, and tends to keep distance from colleagues.

Subject no.2 has podal, ocular and manual (speed and force) dominance on the left side (T1).

General and segmental coordination are very weak, the subject being unable to execute correctly any task at T2, initial testing. On the final testing P.R. manages to execute 1 jump correctly. On the test for oculo-manual coordination (T3), subject no.2 records a notable progress from one test to another, both at throwing and catching the ball and beating the ball to the ground and catching it, on both hands executions.

To maintain balance (T4) she needs more training. The values recorded are weak at both tests with the specification that better results are recorded on favorite side.

The test of motor dissociation (T5) was hardly executed at the initial testing, without allowing to validate the two stages of the test. The reproduction of cadence by slapping hands is done correctly only in the final test for both stages of the test.

Test T6 shows us a subject with a very weak adaption of mental representation of posture during the initial testing (she manages to reproduce correctly only 2 postures); and on the final testing the subject reproduced only 5 postures of 10. The test could not be validated at the final testing because the minimum number of postures properly executed was 6.

G.D. – In terms of motor skills, subject no.3 has no good grades in the motor observation sheet. It is a slow person without accuracy in performing motor acts, the coordination and stability of movements being normal.

**Table 3. Psychomotor tests. Initial testing**

| | T2 | T3 | | T4 | | | | T6 |
|---|---|---|---|---|---|---|---|---|
| | | R | L | R | L | R | L | |
| **D.A.** | 1 | 1 | 0 | 1 | 1 | 3 | 2 | 3 |
| **P.R.** | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 2 |
| **G.D.** | 0 | 0 | 0 | 2 | 1 | 2 | 1 | 2 |
| **C.N.** | 0 | 0 | 0 | 2 | 1 | 4 | 3 | 3 |
| **F.G.** | 1 | 0 | 0 | 3 | 2 | 2 | 2 | 3 |
| **O.R.** | 1 | 1 | 0 | 1 | 1 | 4 | 3 | 4 |
| **A.L.** | 0 | 1 | 1 | 1 | 0 | 2 | 2 | 3 |
| **A.E.** | 1 | 0 | 0 | 2 | 1 | 3 | 3 | 3 |
| **N.A.** | 0 | 0 | 0 | 2 | 1 | 2 | 1 | 2 |
| **S.A.** | 2 | 2 | 0 | 2 | 0 | 4 | 3 | 6 |

As for the perception, in the psychomotor sheet, she is classified with the grade 'GOOD'. She is spontaneous, has initiative and develops contact with colleagues during training. She prefers the right side in all proposed actions to determine ocular, podal and manual dominance (T1) (Massenz, Simonetta, 2002).

Psychomotor tests (Table 4.3.). Following the application of coordination tests, we note the very low level of this component, both in terms of general dynamic coordination (T2) but especially of the segmental one (T3) in both tests. However at the test with ground ball and catching it, subject no.3 makes much better performance than for throwing and catching the same ball, both at the initial and final test.

Maintaining balance (T4) is deficient, the values recorded for all the tests did not exceed 3 seconds.

In the initial testing, at the test of motor dissociation (T5), subject G.D. fails to solve the tasks given both at the first and second stage of the test. The same thing happens in final testing, where for both stages of test, subject no.3 cannot perform the given tasks.

At the last test (T6), subject G.D. fails to score in all tests, static postures correctly represented in the initial testing being 2, and 5 in the final testing.

A.E. – is a subject with reduced motor skills, does not coordinate very well and has a very low speed of execution.

Also in terms of perception he has low skills; he does not appreciate correctly the duration and moment of action and either the form and amplitude of required movements. He does not express his emotions spontaneously and when he does it, he is

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being confused. He is repetitive in the actions involving the use of portable objects.

Table 4. **Psychomotor tests. Final testing**

| | T2 | T3 | | | | T4 | | T6 |
|---|---|---|---|---|---|---|---|---|
| | | R | L | R | L | R | L | |
| **D.A.** | 2 | 2 | 1 | 3 | 2 | 4 | 2 | 5 |
| **P.R.** | 1 | 2 | 3 | 2 | 3 | 2 | 4 | 5 |
| **G.D.** | 0 | 1 | 2 | 3 | 1 | 3 | 3 | 5 |
| **C.N.** | 1 | 1 | 1 | 3 | 2 | 4 | 4 | 4 |
| **F.G.** | 2 | 1 | 1 | 3 | 2 | 4 | 3 | 5 |
| **O.R.** | 2 | 1 | 1 | 2 | 2 | 5 | 4 | 6 |
| **A.L.** | 2 | 2 | 1 | 3 | 1 | 5 | 3 | 5 |
| **A.E.** | 2 | 2 | 1 | 3 | 2 | 5 | 3 | 6 |
| **N.A.** | 1 | 1 | 1 | 2 | 1 | 3 | 3 | 5 |
| **S.A.** | 3 | 3 | 2 | 3 | 1 | 5 | 4 | 8 |

After applying the tests to check the dominance we noted that the subject prefers the right side for lower limbs, upper limbs and eyes (T1).

At the initial testing of psychomotor tests (Table no.3), low levels are due largely to the sensibility A.E. shows. After completing together some trainings, at the final testing he feels more confident and reaches in most tests the score obtained by other colleagues. (Deitz, Kartin, Kopp, 2007)

However he encounters difficulties at the final testing, at the test for postural adaptation (T4) where he records 5 seconds on maintaining balance on unfavorite leg as support and 3 seconds on the other.

The results at the dissociation test (T5) have been good since the initial testing. Upon the final testing he fails to execute the walking test.

Subject no. 8 manages to mentally represent the postures imposed as follows: at the initial testing he correctly identifies 3 of them and at the final testing 6, leading to the validation of the test. This proves us that the programs we proposed had a positive effect on this psychomotricity aspect on subject A.E.

S.A. has the following characterization in the psychomotor sheet:

- in terms of motor skills, subject no.10 shows a very low stability in movements as well as in the case of fluency of movements and their speed;

- in terms of perception she receives the same grade for temporal and motor perception and 'GOOD' for spatial perception;

She asks for further explanations and awaits for confirmation from the trainer, she performs her tasks without reply, she tends to use a certain space and communicates by using body gestures. She makes repetitive actions and is very curious.

Psychomotor tests (Table no.3 and 4). She prefers the right side of the body in all aspects, has a weak general dynamic coordination (T2) and segmental (T3) one.

Gradually, from one test to another, she improves the maintenance time of the balance position (T4) (2 seconds on the right leg on initial testing; 5 seconds on right leg and 3 seconds on the left leg on the final testing).

The test for segmental motor dissociation shows a subject that manages during the initial testing to keep pace only for walking test, while during the final testing she gets valid results both for walking and running test.

**Conclusions**

1. During our research the group subject to tests improved the performance in all tests. Obvious progress is in the results of rational scaling of operational systems.
2. Initial psychomotor tests reveal the deficiencies of subjects in terms of psychomotor qualities so necessary for obtaining a motor independence, and the final tests show the progress recorded over the 7 and a half months of training, in which the operational systems proposed by us were strictly applied every time.
3. The use in preparing mentally retarded adults of psychomotor exercises and games contributed to the increase of general psychomotricity in subjects and especially of specific coordinative qualities, thus confirming our thesis.
4. We strongly believe that psychomotor intervention must be carried out once the mentally retarded child is being diagnosed. Psychomotor preparation by specific means focusing on the development of coordination, body scheme, side and space and time organization is repeatedly given in the training of these individuals, but in such a way that boredom

does not appear, boredom which appears very quickly in their situation.

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