

EFFECTS OF THE REHABILITATION THROUGH MOVEMENT PROGRAM ON THE UNDESIRED WAYS OF BEHAVIOUR IN CHILDREN WITH DELAYED COGNITIVE DEVELOPMENT^{1*}

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This article concerns the influence of focused motor activities on the stimulation of perceptive and cognitive functions, communication, social behaviour, and rehabilitation through movement. It is based on an integrative approach to children's development. The experience of success and content during movement increases the general readiness for learning, the ability to control behavior in social situations, self-confidence, and consciousness of one's own abilities. An evaluation of the effects of the Rehabilitation through movement program (on the decrease of incidence of undesired ways of behaviour showed in the classroom by children with delayed cognitive development) was carried out after a ten-month period of application in a group of 9 children attending lower primary school grades in the city of Zagreb.

An analysis of the results shows that the application of the program caused positive changes in the children's behavior. These results confirm that the program plays an important role in the complex rehabilitation of children with delayed cognitive development.

INTRODUCTION

Undesirable ways of behaviour include all those ways of behaviour seen by the social environment as striking and unacceptable, as well as those which interfere with the acquisition of new skills and habits and therefore make rehabilitation and socialization impossible (Teodorović, Frey, 1986). This definition reveals two basic criteria necessary to determine undesirable ways of behaviour - attitudes of the environment and the child's behavioural disorder level. Therefore, undesirable ways of behaviour are not a static category; they change depending on the changes of the social environment, and at the same time reflect other changes (e.g., those of a neuropsychological nature). They can be the result of a negative influence of the social environment, or the reflection of psychic disorders, and they are formed under the influence of personality traits (Igrić, 1991).

The presence of undesirable ways of

behaviour in children with learning disabilities is a great problem in the process of upbringing, education, and rehabilitation because, in addition to causing learning difficulties, it also reduces the ability for personal and social competence (Eyman, Call, 1977; Mavrin-Cavor, Levandovski, 1985; Mavrin-Cavor, Kocijan, 1987; Mavrin-Cavor, 1986; Menolascino, 1983; Igrić, Stančić, 1990). Aggressiveness, hyperactivity, attention decline, unsociableness, and anxiety are reported to be the most frequent ways of undesirable behaviour.

Various investigators of the relations

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between some characteristics of persons with mental retardation and their social adaptation often give contradictory results. On the one hand, there are positive links between the degree of retardation and the frequency of undesirable behaviour (Ross, 1972), while on the other, in certain conditions, there seem to be more cases of undesirable ways of behaviour among children with mild, than among those with moderate, mental retardation (Mavrin-Cavor, 1986). Some authors, however, have found no statistically significant link between cognitive abilities and undesirable ways of behaviour (Russel, Forness, 1985). The same applies to the age of persons with mental retardation and the frequency of maladjusted behaviour.

Investigations carried out with groups of children with mental retardation under different conditions of education and rehabilitation point to the influence of the environment on social competence (Nihira, 1973; Mavrin-Cavor, 1986; Mavrin-Cavor; 1987). They reveal not only the role of the specific requirements of different environments but also the impact of different expectations on the estimation of competence in children with mental retardation. Bernstein (1970) concludes that children with mental retardation, especially those with atypical behaviour, should be given the opportunity of social development in a suitable environment which will provide positive experience in interpersonal activities, and enable the child to create realistic expectations in relation to himself and to others.

The literature points to great differences

in the procedures applied with the aim of reducing the frequency and occurrence of undesirable behaviour as well as eliminating it (Carr, Robinson, Taylor, Carlson, 1990). The choice and the method of applying certain procedures depend on the abilities and the needs of a single child.

Children with learning disabilities integrated in regular primary schools require additional rehabilitation aimed at releasing their potentials as well as alleviating and eliminating their emotional difficulties and behaviour disorders (Igrić, 1990).

One of the rehabilitation approaches dealing with such a population is Rehabilitation through Movement (Levandovski, Mišić, still printed), which results from the realisation of the significant influence of motoric activities on the complete development of a child. The work is based on acquiring and improving motoric skills and abilities with a special emphasis on deviant ones. The stimulating effect of directed motoric activities on perceptive and cognitive functions, communication, and social behaviour provide an integrative approach to the complete development of the child. Through the experience of success and satisfaction in movements, general readiness for learning is increased, as self-confidence and consciousness of one's own capabilities are developed.

In accordance with the characteristics of children with learning disabilities, in the Rehabilitation through Movement program a particular emphasis is made on the development of social behaviour. The program makes use of movement games, especially those suitable for the development of social relations and their consolidation; they help to build the relationship that an individual has with himself and with others, and they develop group cohesion as well. In this way they also have an indirect influence on the decrease in the occurrence of undesirable ways of behaviour.

Table 1. RL structure and research variables

N° OF PARTICLES	DESCRIPTION OF PARTICLES	RESEARCH VARIABLES
1 - 4	behaviour toward teacher	1
5 - 9	behaviour towards other pupils in the class	2
10 - 14	behaviour of other pupils towards examinee	3
15 - 19	behaviour during lessons	4
20 - 29	special behaviour expressed in the class	5

Also used in Rehabilitation through Movement are exercises done in pairs. These are directed at noticing the activities and movements of others, and they also encourage social contact.

Group cohesion is created particularly in group exercises performed in a circle.

Free movement forms, in addition to having the same objective as the above stated exercises, also have specific aims since they require the anticipation of the movements of others.

Particularly helpful for the correction of negative social behaviour are exercises in

group leading (line leading, dictating movement forms, and the link). Although in Rehabilitation through Movement, each occurrence of undesirable behaviour is to be completely ignored, here the group leader can consciously intervene by assigning the role of the leader to shy and insecure children, and by making those that stand out too much members of the group following the leader.

OBJECTIVE OF STUDY

The aim of this work is the evaluation of the effects of the Rehabilitation through Movement program for the decrease of undesirable behaviour in the class expressed by children with learning disabilities who are integrated into regular primary schools.

Table 2. Undesirable behaviour measured by LUBF and research variables

UNDESIRABLE BEHAVIOUR	VARIABLE
<ul style="list-style-type: none"> • violent behaviour • unsociable behaviour • inadequate behaviour • passivity • shyness • autoaggressive behaviour • hyperactivity • sensoric unrest • sensomotoric unrest • undesirable verbal activities during school lessons • stereotyped behaviour • inadequate behaviour during school lessons • frustrations • walking around classroom during school lessons 	6

RESEARCH METHODS

Sample of subjects

The sample included 9 pupils attending lower grades in regular primary schools, aged 7 to 10. The cognitive status of the examinees ranged from 62 to 80 IQ, with 7 examinees having additional disorders. All the pupils being studied lived with their own families; 5 of them had middle, and 4 had lower, socio-economic status. All the examinees manifested some ways of undesirable behaviour (hyperactivity, attention decline, unsociableness, aggressiveness, anxiety).

Measurement instruments, variables sampled, and examination organisation

Twice a week during a period of 10 months the pupils being studied were involved in treatment based on the Rehabilitation through Movement Program.

For the needs of this study we used data gathered by the following means :

- Record list for detecting and monitoring children of primary school age with developmental difficulties (RL), by V. Stančić, D. Levandovski and Lj. Igrić (1990). The results of the first part of RL, consisting of 29 particles grouped in 5 areas of behaviour were analysed (Table 1).

Table 3. Undesirable behaviour measured by LUBD and research variables

UNDESIRABLE BEHAVIOUR	VARIABLE
<ul style="list-style-type: none"> • motoric unrest • passivity • hyperactivity • sensoric unrest • sensomotoric unrest • undesirable verbal activities during school lessons • inadequate behaviour during school lessons • autoaggressive behaviour • unsociable behaviour • stereotyped behaviour 	7

The instrument stated above was used at the end of the class on a day set in advance (the first Wednesday in two months, before and after carrying out the Program - 5 equidistant time points) when the teachers assessed the behaviour of the pupils according to the above - mentioned areas of behaviour.

The stated areas of behaviour compose the variable sample of the investigation (variables 1 - 5).

Table 4. Differences among arithmetic means of results for RL

MU	HT ²	DF 1	DF 2	F	P
6.9546	41.7276	4	2	4.1728	0.203299

Legend:

- MU = Mahalanobis's distance
- HT² = Hotelling's T²
- DF 1 and DF 2 = freedom degrees
- F = F-test
- P = significance level

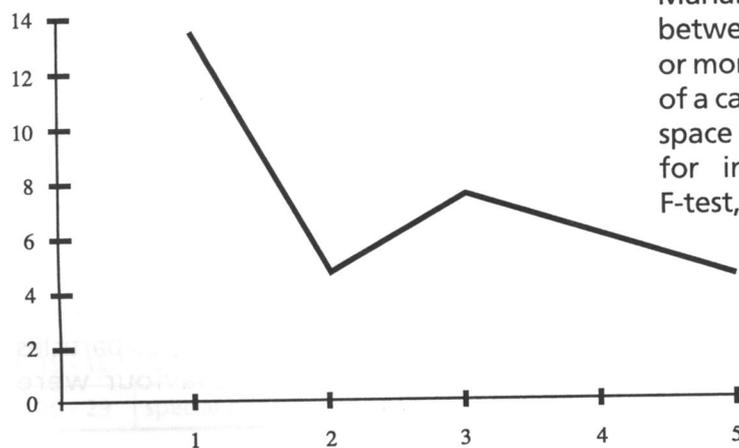
Table 5. Arithmetic means of RL results differences at each time point and partial discriminative coefficients

VT	M	BETA
1	13.5333	1.0755
2	4.7000	0.2389
3	7.4233	-1.3552
4	5.8667	-1.5191
5	4.3450	2.3585

Legend:

- VT = time points
- M = arithmetic means of centered results
- BETA = partial discriminative coefficients

Figure 1. Arithmetic means of centered RL results at each time point



- The List of Undesirable Behaviour (LUB) in the classroom used in the observation of the frequency (Table 2) and the duration (Table 3) of undesirable ways of behaviour.

The observations were performed by trained observers who observed the total behaviour of examinees during the lessons, on the first Wednesday of each month except in the first and the last month of the Program application (8 equidistant time points).

Frequency of occurrence of the above - stated undesirable ways of behaviour represents the 6th variable, while duration represents the 7th variable in the sample of research variables.

Data processing methods

Quantitative changes testing was done in certain groups of objects described by one quantitative variable at several equidistant time points for the needs of the evaluation of the effects of the Rehabilitation through Movement Program on the decrease in undesirable ways of behaviour in the examinees.

RESULTS

In order to analyse the RL results of the examinees, we made an analysis of the changes in the sample described by one variable along the series of time points.

Table 4 shows the arithmetic means obtained on the basis of the differences in results between each pair of points, Mahalanobis's distance (measure of distance between two points in space defined by two or more correlated variables. It is the distance of a case from a centroid in multidimensional space and it is identical to Euclidean distance for independant variables), Hotelling's T², F-test, and the significance level P.

As the significance level is P=20.33% with MU=6.95 and HT²=41.73, we can say that there is no statistically significant difference between the arithmetic means, i.e., differences resulting

from the treatment are not statistically significant. The data obtained provide no justification for the interpretation of Table 5, i.e., we cannot analyse in which spot the changes in the arithmetic means took place.

However, analysing Figure 1, which shows the graphic representation of the arithmetic means of the centred results, we can clearly

Table 6. Difference between arithmetic means of LUBF results

MU	HT ²	DF 1	DF 2	F	P
57.1807	514.6260	7	2	18.3795	0.062308

Legend:

- MU = Mahalanobis's distance
- HT² = Hotelling's T²
- DF 1 and DF 2 = freedom degrees
- F = F-test
- P = significance level

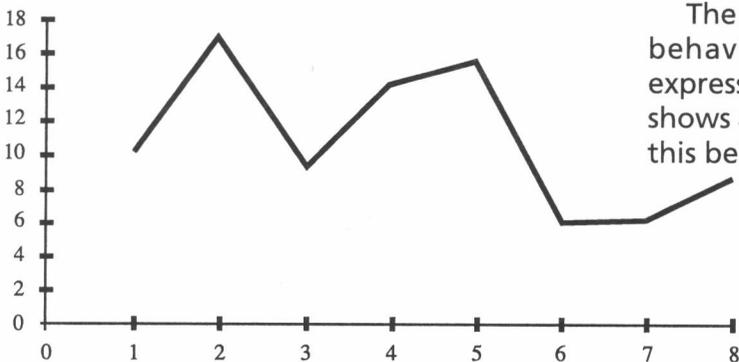
Table 7. Arithmetic means of the LUBF results differences at each time point and partial discriminative coefficient

VT	M	BETA
1	10.1111	1.8241
2	16.8889	-0.4082
3	9.1111	-1.4361
4	14.0000	1.5480
5	15.2222	1.1691
6	5.6667	-2.9979
7	5.8889	2.1249
8	8.2222	2.8853

Legend:

- VT = time points
- M = arithmetic means of centered results
- BETA = partial discriminative coefficients

Figure 2. Arithmetic means of centered LUBF results at each time point



notice the declining tendency in the results. Besides, a noticeable decrease in undesirable behaviour occurs between time spots 1 and 2. Later in the treatment, however, there are no significant changes in arithmetic mean

According to the teacher's assessment, and under the influence of the Rehabilitation through Movement Program, undesirable ways of behaviour manifested by examinees in the class and during the lessons towards the teacher and the other pupils, as well as the behaviour of the other pupils towards the examinees (RL) seem to have been corrected to a certain degree.

Analysing the examinees, results expressed by the frequency of undesirable ways of behaviour (LUBF) observed at 8 equidistant time points (Table 6), we can notice that the difference in results are at the very limit of statistical significance (P=0.062). The arithmetic means of the result differences at each time point and the partial discriminative coefficient are shown in Table 7, while the graphic representation of the results is given in Figure 2.

Table 6 shows that there is no justification for accepting the hypothesis about the differences between arithmetic means in 8 equidistant time points. Therefore, the interpretation of Table 7 is not justified.

By observing Figure 2 it can be concluded that undesirable behaviour oscillates between time point 1 and 5 with a significant fall occurring after time point 5. This tendency of undesirable behaviour to fall towards the end of the treatment points to the fact that the extension of the treatment would be likely to bring about further improvement in the results.

The observation of undesirable ways of behaviour, measured by observers and expressed through duration (LUBD), clearly shows a certain decline in the occurrence of this behaviour.

Table 8 makes it clear that there were statistically significant differences in the duration of undesirable ways of behaviour (LUBD), observed at 8 time points (P=0.019).

Graphic representation of the results can be seen in Figure 3, while the arithmetic mean values and partial discriminative coefficient at each time point are shown in Table 9.

The treatment can be said to have resulted in statistically significant changes in

Table 8. Difference between arithmetic means of LUBD results

MU	HT ²	DF 1	DF 2	F	P
369.7568	3327.8115	7	2	118.8504	0.019369

Legend:

- MU = Mahalanobis's distance
- HT² = Hotelling's T²
- DF 1 and DF 2 = freedom degrees
- F = F-test
- P = significance level

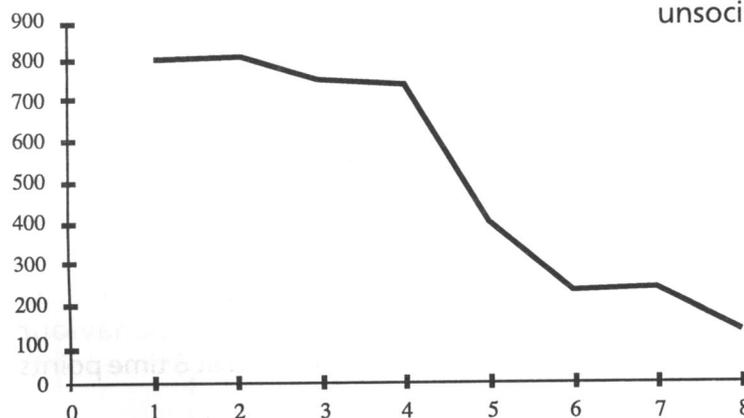
Table 9. Arithmetic means of the LUBD results differences at each time point and partial discriminative coefficient

VT	M	BETA
1	802.1111	0.0700
2	803.1111	0.5392
3	747.7778	-1.0502
4	732.5555	-0.6137
5	394.2222	2.5648
6	224.1111	2.4477
7	226.6667	0.3515
8	121.1111	-4.3253

Legend:

- VT = time points
- M = arithmetic means of centered results
- BETA = partial discriminative coefficients

Figure 3. Arithmetic means of centered LUBD results at each time point



the duration of undesirable behaviour (error for this statement is less than 5%). Accordingly, Table 9 can be correctly interpreted.

An examination of the arithmetic mean shows a decrease in the duration of undesirable behaviour after time point 2. This decrease is minor until time point 4. Between time points 4 and 5 sudden changes occur (from 732.5 to 394.2).

Somewhat milder changes can also be noticed after time point 5.

Observation of the partial discriminative coefficients indicates that the highest BETA is at time point 8 (-4.33), followed by 2.56 at time point 5 and finally by 2.44 at point 6.

The greatest changes, that is, the greatest decrease in the duration of undesirable behaviour in examinees, occurred at these time points.

Figure 3 clearly represents Table 9.

The constancy of the values at the first two time points is followed by a drop in the results which occurs at time point 3. The continuity of the fall is also reflected at time point 4, whereas at point 5 there is a sudden fall in average duration of undesirable behaviour. At the other time points there is a tendency of decline in average values from point to point as well.

The analysis of LUBD results shows that under the influence of the Rehabilitation through Movement Program, there is a statistically significant decrease in duration of the following types of undesirable behaviour in the examinees: motor unrest, passiveness, hyperactivity, sensoric unrest, speech during lessons, inadequate behaviour during lessons, autoaggressive behaviour, unsociable behaviour, and stereotypes.

DISCUSSION AND CONCLUSION

Significant effects on the changes in examinee behaviour were shown after the application period of the Rehabilitation through Movement Program. It should be emphasised once again that Rehabilitation through Movement is an integral approach affecting the total behaviour and development of the child, therefore the obtained effects may be affected by factors other than the rehabilitation program itself.

Instead of treating the undesirable behaviour of the examinees separately, the Program indirectly influenced the social aspect of their behaviour.

It is interesting to notice that the teachers, although active participants in the integration process and definitely more objective observers, at the same time made different assessments of the examinees' behaviour. The teachers were much "stricter" in their assessments, and although their judgement results show the decrease in the undesirable behaviour of the examinees, these differences are not statistically significant, as it is in the case with the observers' results.

Indeed, the teachers were limited to a certain extent by the range and the description of undesirable behaviour offered by the measurement instrument used in the assessment of pupils' behaviour (RL), which was made after the lessons on a day set in advance. On the same day the observers noted down all the types of undesirable behaviour noticed in the examinees.

The RL structure, mentioned earlier, can offer an explanation of such results. It is possible that the RL structure should be used for measuring more complex ways of

behaviour which makes them less liable to change (the relation towards the teacher and towards other classmates), whereas the observers used it for measuring all the undesirable ways of behaviour (directed to others, to oneself, and to the objects). On the other hand however, the teacher seems to have negative expectations in relation to children with learning disabilities, particularly to those who manifest a rather large number of undesirable ways of behaviour. Such expectations result in the teachers having difficulty in noticing and evaluating the positive aspect in the child's behaviour, and they are under the influence of the teachers usually negative attitude towards these children and their integration into regular primary schools.

Therefore, there is urgent need to transform such teachers' attitudes. Harling, Stein and Cruickshank (according to McEvoy, Nordquist and Cunningham, 1984) stressed their importance back in 1957. when they warned that teachers' attitudes towards children with learning disabilities affect not only the successfulness of the integration process but also the direction of the intellectual, social, and emotional development of such children.

The analysis of the obtained results has shown that the application of the Rehabilitation through Movement Program results in positive changes in the behaviour of the examinees, which confirms that the Program has an important place in the complex rehabilitation of children with learning disabilities who are integrated into regular primary schools.

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