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The Impact of Cognitive Intervention Program and Music Therapy in Learning Disabilities

Ema Skeja^{a*}

^a*University of Tirana, Faculty of Social Sciences, Boulevard "Nëna Tereza", 183, Tirana, Albania.*

Abstract

The aim of this experimental study is to evaluate the impact of Cognitive Intervention Program for Children with Learning Disabilities in collaboration with music therapy. This research consisted from 12 participants, children with ages differing between 6 - 7 years. Cognitive Intervention Program in collaboration with music therapy has been applied to 6 children that are in the experimental group. Other 6 children in the control group received only Cognitive Intervention Program, that was developed based on PASS theory. CAS test on two groups of children was performed after the interventions. The CAS total final test scores, suggests that experimental group resulted with significant difference from control group, $p = .002$. Based on the findings of this study it can be suggested that interconnection of Music Therapy with Cognitive Intervention Program enables children with learning disability to be a step ahead in four problem areas, since intervention in these areas is twofold and can cover weaknesses of each other.

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1. Introduction

Learning Disorders are diagnosed when the individual's achievement on individually administered, standardized tests in reading, mathematics, or written expression is substantially below that expected for age, schooling, and level of intelligence. The learning problems significantly interfere with academic achievement or activities of daily living that require reading, mathematical, or writing skills (DSM-IV-TR, 2000). The Planning, Attention, Simultaneous, Successive PASS (Naglieri & Das, 1997) theory is rooted in the work of Luria (1973) whose research on the

* Ema Skeja. Tel.: +377-44-429-853
E-mail address: emaa@live.com

functional aspects of brain structures formed the basis of the theory (Das, Naglieri & Kirby, 1994; Das, 1999a). Das and Naglieri and their colleagues used Luria's work as a blueprint for defining the important components of human intelligence (Das, Naglieri & Kirby, 1994). Their efforts represent the first time that a specific researched neuropsychological theory was used to re-conceptualize the concept of human intelligence. *Planning* is a frontal lobe function. Attention is a mental process that is closely related to the orienting response. Simultaneous Processing is essential for organization of information into groups or a coherent whole. Successive Processing is involved with the use of stimuli arranged in a specific serial order. In the other hand in music therapy area, researches have concluded that music can be used to practice and discriminate between sounds, aid in the development of receptive and expressive speech and language skills, improve choice making, communicate information/knowledge and develop an understanding of patterns of language (Bottari & Evans, 1982; Gold, Voracek & Wigram, 2004). Also music can be used as mnemonic device to teach specific academic information such as a phone number, address, and other factual information (Claussen & Thaut, 1997; Thaut, Peterson & McIntosh, 2005). Music therapy is effective in improving hand-eye coordination and gross and fine motor skills through instrument playing (Briggs, 1983). Music therapy is a motivating setting in which a child's social skills can be enhanced (Brodeur, 1990). The child can practice following directions, role-playing appropriate responses to social situations and participate in a group experience with peers (Hooper, 2002).

2. Current study

The goal of this experimental study is to evaluate the impact of Cognitive Intervention Program for Children with Learning Disabilities in collaboration with music therapy. In this study, Cognitive Intervention Program for Children with Learning Disabilities was suited based on "PASS Reading Enhancement Program" -PREP. PASS Reading Enhancement Program was developed by Dr. Das and his colleagues at the University of Alberta (Das, 2000). The program is based on the PASS Theory of Intelligence (Planning, Attention, Simultaneous and Successive Processing). PREP was designed to improve simultaneous and successive processing that underlie reading, while at the same time avoiding the direct teaching of word reading skills (Das, 1999b, 2000; Naglieri & Das, 2002). The researches by Carlson and Das (1996), Das et al. (1995), and Boden and Kirby (1995) indicate that word attack and word decoding improved after completion of PREP. These results suggest that PREP appears to be effective with elementary school-aged students who have reading decoding problems that are related to successive processing difficulties. Its success in Spain and South Africa also indicates that the program can be effectively adapted to various cultural contexts. On other side the researches done by (Wallace, 1994; Watson, 2007) have suggested that the music therapy is effective in improvement of cognitive function. Therefore as main objective of this study is collaboration of these two treatments, the music therapy and Cognitive Intervention Program.

H: Children with learning disability, where was worked with them with Cognitive Intervention Program and Music Therapy will have higher scores on the final CAS test, unlike the children that only with Cognitive Intervention Program was worked with them.

3. Methods

3.1. Participants

This research consisted from 12 participants (n=12), children which diagnosed with learning disability, ages differing between 6 - 7 years, 8 boy (66%) and 4 girl (33%). Out of them, 6 children compose the experimental group and another 6 children compose the control group.

3.2. Instruments

- *Questionnaire for demographic data:* this questionnaire was filled out from the parents of participant children, and included only 5 questions through which data regarding age, residence, diagnosis, music origin of family were collected.

- *The Cognitive Assessment System-CAS* (Naglieri & Das, 1997) is a standardized test of cognitive abilities (intelligence) based on the PASS theory (Das, Naglieri & Kirby, 1994). CAS was used to score difference between experimental group and control group after music therapy and Cognitive intervention program.

3.3. Participants

The study has been carried out in 6 stages. In the first stage the Cognitive Intervention Program has been adapted for the context of Albanian culture. Also in this stage Music therapy has been adapted in this regard. In second stage selection of participants from day care center was carried out, whereas children with Learning Disability Diagnoses have been selected. After the selection procedure, the study has continued with realization of demographic questionnaire. Selected children have been divided in two groups, one experimental group and one control group. In the next stage CAS first test on two groups of children was performed. In fourth stage with experimental group, Music therapy- Cognitive Intervention Program was realized, whereas with control group only Cognitive Intervention Program was realized. Both of them has been realized for 3 months, and consisted of total 40 sessions for each group. In other stage CAS final test on two groups of children was performed. Lastly in the final stage of the study, Analysis of the data was performed.

4. Results

Mann-Whitney U test is used to compare differences between two independent groups when the dependent variable is either ordinal or continuous, but not normally distributed. In the table 1, the mean rank for the experimental group is MR=8.06, the Sum of ranks is SR=64.50. The CAS total first test scores, suggests that experimental group resulted with non-significant difference from control group, $p = .721$.

Table1. Score difference between Experimental group and Control Group on CAS total first test

f		Mean Rank	Sum Of Ranks	P
Experimental	6	8,06	64,50	,721
Control	6	8,94	71,50	
Total	12			

In order test the main hypothesis, also the test Mann-Whitney U has been applied. In the table 2, the mean rank for the experimental group is MR=12, the Sum of ranks is SR=96. The CAS total final test scores, suggests that experimental group resulted with significant difference from control group, $p = .002$.

Table2. Score difference between Experimental group and Control Group on CAS total final test

Group	N	Mean Rank	Sum of ranks	P
Experimental	6	12,00	96,00	,002
Control	6	5,00	40,00	
Total	12			

5. Discussion

In this study the CAS total first test scores, suggests that experimental group resulted with non-significant difference from control group. As such this result indicates that groups prior their training do not have significant statistical differences between them, and this will not have any impact in results of CAS total final test. On the other hand to verify the main hypothesis the CAS total final test has been measured. The CAS total final test scores, suggests that experimental group resulted with significant difference from control group. In the last years number of research is increasing and they suggest that people with learning disorders have difficulty with specific skills involving coordination accuracy or speed and which includes rhythmic skills too (Rodd, Davis & Johnsrude 2005). In the study of Overy (2000), children with dyslexia showed higher scores than the control group in 3 tests at this level of skills (this is attributed to their hidden excellent musical skills of) but the results were lower than the control group on 7 of 9 rhythmic skills tests (sense of rhythm) music. Particular difficulties were noted in tests that were included temporary quick processing. These results are a good indicator and supports connection between music therapy and PASS theory and the implemented program.

6. Conclusion

In conclusion, the findings of this study contribute to current literature on music therapy and PASS theory practicing area. Analyzing further we conclude that the PASS theory identifies four problem areas for children with learning difficulties (Naglieri & Kaufman, 2001), and on the other side Cognitive Intervention Program is a program that directly promotes the development of these four areas (Das, 2000). Based on the findings of this study it can be suggested that interconnection Music Therapy with Cognitive Intervention Program enables children with learning disorders to be a step ahead in these four areas, since intervention in these areas is twofold and can cover weaknesses of each other. The study is not without limitations, and the main set derives from the usage of non-standardized test-*The Cognitive Assessment System, CAS* in Albanian culture. Future researches should evaluate the duration of known improvements at these children; hence this research has limitations regarding this area. Measurement of durations of the treatment effects would make this research richer.

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