

EUROPEAN PSYCHOMOTRICITY JOURNAL

<http://www.psychomotor.gr/epj.htm>

ISSN 1791-3837

European Psychomotricity Journal 2008; 1; 1, 12-16

Special Issue: 1st Symposium of SPA-Hellas

Published by: Athlotypo Sports Publishing

<http://www.athlotypo.gr/>

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A transdisciplinary assessment of sensory motor and psychomotor skills of children with developmental disability

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Abstract

The need to understand better the complex problems that can reflect the profile of a developmental disability seems to be served by multidimensional solutions. Therefore this paper will present the results of a transdisciplinary assessment of sensory motor and psychomotor skills of children with developmental disability. Subjects were 19 children, eleven with mild mental retardation and seven with developmental disabilities. The mean age was 7.3 years old. The instruments used were the LOS-KF-18, the sensory profile and a music rhythmic test. In interpreting the results it appears that the important cross-correlations found between LOS-KF-18, the sensory profile and the music rhythmic test conform to theoretical precedents and inquiring data. All correlations are statistically significant. A multidimensional assessment such as the transdisciplinary approach can provide a more functional profile of the child with developmental disability since it refers to the correlation between functional skills. Further research is needed to determine the correlation between sensory motor and psychomotor development in order to determine the best practices for the intervention in children with developmental disability.

Keywords: *LOS-KF-18, rhythmic perception, sensory profile*

Introduction

The need to ensure better services for children with developmental disabilities has brought up a scientific discussion about the model of interdisciplinary assessment. The term “developmental disability” refers to different kinds of problems and often engages many health professionals working in teams toward a solution (Dreaschlin et al., 1999; Polmanteer, 1999). Furthermore, many professional organizations have endorsed the practice of transdisciplinary assessment because it merges medical and educational services in order to meet the needs of each child with disabilities. The research questions that arise are:

- Is there a correlation between the short form of Lincoln - Oseretzky (LOS-KF-18), the Sensory Profile and the music rhythmic test?
- If there is a correlation how can it be interpreted?

Method

Participants

For this research a convenience sampling was selected (Patton, 1990). In compliance with the objective of the research, the sample was 19 children with developmental disability from 5 until 12 years of age, 15 boys and 4 girls medium age 7.3 (± 1.6) years. According to the official diagnostic assessment, 11 children were diagnosed with mild mental retardation and 7 with developmental disability. The distribution of sex according to the disability is the same.

Procedure

The specialists who were involved in the transdisciplinary assessment team of this research were a special educator, an ergotherapist, a music teacher, and a gymnastic teacher¹. Three research tools/ tests were used:

1) The Short form of Lincoln-Oseretzky (LOS-KF-18) (Eggert, 1974), that contains 18 items and is quite similar to the Bruininks-Oseretsky Test of Motor Proficiency (Bruininks, 1978). These items represent various psychomotor skills like balance, bilateral coordination, visual-motor control, upper-limb coordination and upper-limb dexterity. However, the LOS-KF-18 gives only one score indicating the children's level of motor development. This test was employed for two reasons. Firstly, norms are provided separately for three population groups (typically developed, learning disabled and mentally retarded children, ages 5 through 13). Secondly, the selected test is characterised by economy regarding its administration time.

2) The Sensory Profile (SP) (Dunn, 1999) is a questionnaire which is based on the caregiver's opinion. Each subject area describes the child's reaction to different sensory experiences. The answers concern to the frequency² at which these behaviors appear. Thereafter, a trained professional scores the answers that were marked on the questionnaire. The Sensory Profile is composed of 125 items, which are grouped into three basic areas: Sensory Processing, Modulation, and Behavioral & Emotional Reactions. For the purpose of this specific study the Sensory Processing

¹ Both the music and gymnastic teacher had master studies in special education.

² Always – 1 point, Frequently – 2 points, Occasionally – 3 points, Seldom – 4 points, Never – 5 points

area was chosen because it refers to the abilities which were thought to be relevant to this study, and these were the scores that were compared.

3) Music Rhythmic Test (Grant/ LeCroy, 1986), evaluates the performance in rhythm pattern duplication via tactile, auditory, auditory-visual and auditory-visual-tactile stimuli.

Results

The absolute values of children in LOS-KF-18 ranged from 0 to 10 points out of 18 that was the highest. As it appears there are some significant correlations between the four items of the Sensory Profile and the four items of the LOS-KF-18. More specifically, there is a significant correlation³ between:

1. "Poor Registration" from SP with the following items or the LOS-KF-18 "Drawing a line through a curved path with preferred hand" (.48*) & "Circular movements of the index fingers to the side" (.48*),
2. "Fine Motor" from SP with the following item or the LOS-KF-18 "Placing pennies and matches in a box with two hands" (.50*),
3. "Visual Processing" from SP with the following items or the LOS-KF-18 "Placing pennies and matches in a box with two hands" (.55*) & "Catching a tennis ball with preferred hand" (.48*), and finally
4. "Tactile Processing" from SP with the following item or the LOS-KF-18 "Circular movements of the index fingers to the side" (.50*).

Regarding the correlations with the "Poor registration" from SP it is logical, because immediate understanding and the ability to act are required for good functioning in the specific tests in the LOS-KF-18. The correlation of "Tactile Processing" on the Sensory Profile with the above mentioned categories on the LOS-KF-18 may be due to the relationship between adequate function in tactile processing and motor planning and motor performance. Considering all the above, we would expect a more significant relationship between the "Vestibular Function" on the SP and the previously mentioned areas on the LOS-KF-18. The positive correlation that appears

³ (N=19, † p<.10, * p<.05, **p<.01)

between the areas of "Fine Motor", "Visual Processing", and "Tactile Processing" on the SP and performance "Coins and matches with two hands" on the LOS-KF-18 is expected because these areas of the SP are prerequisites for successful performance on the motor development. Furthermore, a significant statistical tendency is also considerable between the auditory condition (.44[†]) and the tactile condition (.45[†]) of the music rhythmic test with the auditory processing of the SP. When considering the LOS-KF-18 and the music rhythmic test, 9 out of the 18 items of the LOS have shown correlations with the four conditions of the music rhythmic test. This should be considered for further research in order to determine the correlation between motor development and development of rhythmic perception.

Discussion

The correlations may be due to the fact that adequate function in the previously listed areas of the SP is necessary in order to receive a high score in such a complex and bilateral test as that in the LOS-KF-18. Many areas of the SP involve questions regarding motor control, the manipulation of objects, and academic performance. Adequate performance in these areas would also be expected to lead to a high performance score in this specific test on the LOS-KF-18. The results of this research, as a pilot study, cannot be generalized and there are some limitations, regarding the number of participants and the fact that the SP is a questionnaire, which is completed by parents/ caregivers. Therefore, objectivity is compromised. The whole process is a proposal and a further reflection since it points out the importance that should be given in the future to the transdisciplinary assessment and the cooperation among specialists. Through this process the need to determine the best practices that can provide better treatment and intervention for children with developmental disability can be fulfilled. We hope that the scientific community continues on the road for evidence based practice.

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