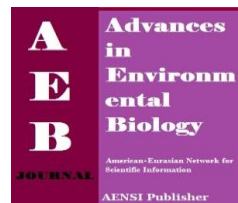




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Comparison between Learning Disorder and Normal Children on Movement Skills

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ABSTRACT

Introduction: learning disorders is one of the most common disorders in school children. These children usually have problems in various areas such as attention, motor skills and cognition. The purpose of this study is to compare the movement skills in students with learning disorders with those of age matched typically developing children. **Methods:** in this research, 50 students diagnosed to suffer from LD compared with 50 normally children in term of movement skills using Lincon Osertsky test. Then, the data were analyzed in SPSS using Independent t-test. **Results:** the students diagnosed to have LD, according to the results of this research, showed a weaker performance than that the normal students. **Conclusion:** This study shows the importance of specific interventions for facilitating both motor and academic abilities.

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INTRODUCTION

It is now theoretically agreed that there is a connection between motor abilities and cognitive development. according to Piaget's cognitive-developmental theory, motor and cognitive development are effectively related: in his view, a child's motor capabilities give rise to increasing possibilities to explore and understand the environment, goes to more and more differentiated cognitive structures [12]. And, there is neurological document that the prefrontal cortex, the cerebellum, and the connecting structures get co-activated in cognitive and motor tasks and impaired functioning of these brain structures may express itself in motor dysfunctions as well as in cognitive dysfunctions [6]. Studies has shown that higher gross motor capacities facilitate children's cognitive performance [3,10,13]. In 2006 the international Committee on learning disorder identified the defect and delay in the growth of motor skills as one of the most important factors for a diagnosis of learning disorder during the growth steps. The researches show if the gross and fine motor capacities grow well, the children's cognitive function (especially the academic capabilities in reading, mathematics and language) will be facilitated [15,16]. To act well in the educational environment the child should be able to sit up, pay attention, and use the writing tools and control a series of eye movements. These are physical activities that are associated with the maturation of motor skills [2]. Moreover, with an increasing interest in prerequisites for a successful transition into school, that is, when seeking for reliable and valid indicators of children's school readiness, especially motor skills (manual dexterity/hand-eye-coordination) have been found to be important predictors for academic achievement in the first elementary school years [1,7,9,11,15]. And finally, not only children differences in early academic achievement appear to be connected to earlier motor skills, but also precursors of mathematics and literacy in kindergarten are specifically predicted by young children' fine motor skills [5]. As motor skill is assumed to foster academic capabilities [15,16], it is important that children with problems in academic achievement have sufficient proficiency in motor skills. In addition, children with LD generally have poor gross motor skills compared to their peers [17,18]. If this is the case then, it is important to study the specific relations the gross and fine motor skills between LD and normal children.

Methods:

Participants:

We recruited 70 children, aged between 7 and 11 years old, all with confirmed learning disorders from one primary special-needs school located in the Tehran. twenty children were subsequently excluded because their

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individual school files stated they were also diagnosed with Attention Deficit Hyperactivity Disorder. The final study sample comprised 50 children (34 boys and 16 girls) with a mean age of 9.4 years (SD 1.4; range 7–11). Based on the information provided in their individual school files, the children's mean intelligence quotient was 89.9 (SD 7.6; range 80–114). To collect gross motor skill reference values for the LD group, we recruited 50 aged-matched typically developing peers (34 boys and 16 girls) with a mean age 9.4 years (SD 1.4; range 7–11) attending two mainstream schools in the same region. The children's grade level was appropriate to their age. The two groups (children with LD and typically developing children) did not statistically differ from each other on gender $F(1,207) = 1.308, p = .254$. Parents and children completed consent forms prior to participation in the study.

Instrument:

Lincoln-Oseretsky Motor Development Scale:

Lincoln Oseretsky motor development scale is designed to assess the motor skills of children aged five to 14 years old. The scale is run individually and has 36 items and assesses a variety of motor skills, such as: finger dexterity, coordination of eyes, hands and the large muscles in arms, legs, and upper part of the body. Reliability coefficients of the above mentioned tests for boys and girls of all ages was 0.96 and 0.97, respectively. Considering these coefficients, the test had high internal reliability.

Data analysis:

The statistics were performed using SPSS software (version 16.0) and a significance level of .05. Independent samples t-tests were used to detect differences between groups for movement variables of subtest scores.

Table 1: Comparative of Gross motor in LD & Normal group

Group	N	M	SD	P
LD	50	6.86	2.12	0.05
Normal	50	14.76	1.24	0.05

Results: at first, a comparison was conducted between the gross movements of learning disorder groups and normal groups. These movement involved (jumping over the rope, catching the ball, throwing the ball and jumping and touching the heel) that totally are four quite distinct movements. In this section we try to evaluate the gross muscle function. Table 1 compares the two groups based on t test and there were a significant difference between the two groups statistically and $p < 0.05$ and $t = 11.073$. The learning disorder students gained lower score in performing gross movements; that means they acted poorly.

Table 2: Comparative of fine motor in LD & Normal group

Group	N	M	SD	P
LD	50	18.01	2.84	0.05
Normal	50	38.32	2.24	0.05

In the next part of the study, the comparison was performed between fine movements in two groups. In this study the fine movement includes: Touching the tips of hand fingers, finger gestures, making the ball, screwing the thread around the spool, drawing a circle in space, the bundling the matches, drawing a line, cutting the circle, putting coins in the box. Table 2 show the statistical comparison between the two groups in the subtest fine movements that the value of $t = 3.012$ was obtained. The learning disorder groups obtained the average of lower scores.

Discussion and Conclusion:

This study aimed to assess the gross and fine motor skills in children with learning disorders compared with the normal peer group. The results showed that the gross and fine motor skills in children with learning disorders compared with the normal peer group were significantly lower. Findings of this study are consistent with the research of Jongmans, Engelsman and Shoemaker (2003) and Son and Meisels [15] Pieters, Desoete, Roeyers, Vanderswalmen & Weelvelde [14]. In a study, Jongmans, Engelsman and Shoemaker compared the motor problems of children with learning disorders. The research results showed that the children with learning disorders act at a lower level in the motor skills than their peers. In a research Son and Meisels [15] studied the relationship between the motor skills in the early years and academic achievement in reading and math in the first grade of Elementary School. The results showed that the motor-visual skills significantly predicted the educational achievement in the next years and the deficits in this skill can be considered as a risk factor for identifying the academic failure in subsequent years. In a research Pieters, Desoete, Roeyers, Vanderswalmen & Weelvelde [14] studied the motor skills and understanding in the children with learning disorders. The study results showed that children with learning disorders acted significantly poorer in motor skills than the control

group. The studies show that the on successful educational learning is dependent on mastery of motor skills: For example, reading needs to control and grow the slow eye movements to a send a steady stream of serial data to the brain. Eye movements are the motor skills. To write the child needs to coordinate the eye and hand. Sitting and caring need to the situation, balance, and orientation control [2]. Children who have the difficulties in these basic motor skills, often are exposed to low progress and learning disorders that are not due to intelligence problems or desire to learn but they do not have supportive ground for physical intelligence and knowledge and if these motor areas involved in learning, are not recognized and treated, the child may be also shown the secondary failure and behavioral symptoms in addition to educational problems. So we can conclude that learning disorders is not only related to the defects in educational skills but also involves the areas such as motor skills, visual perception skills and integration [15,14]. This study helps us not to consider these disorders as a distinct problem but also to study the disorders associated with it in the diagnostic and treatment processes. A limitation of the present study is that these results do not address causality of the relationships found: do higher levels of motor skills lead to better academic performance or vice versa? As a growing body of literature states that well-developed motor capacities boost children's academic abilities [10,13], we suggest based on the present study, that a motor skill intervention aimed at improving motor skills will stimulate the performance in academic learning. Despite these limitations, this study contributes to the sparse literature available about the specific relationships between gross and fine motor skills and academic performance in children with LD.

Conclusion:

Students with learning disorder have suffered from many problems in movement skills. Making plans to rehabilitate such potentialities in such children can help them concentrate more on their movements and learning.

REFERENCES

- [1] Bart, O., D. Hajami and Y. Bar-Haim, 2007. Predicting school adjustment from motor abilities in kindergarten. *Infant and Child Development*, 16: 597-615.
- [2] Blythe, S., 2012. Assessing neuro-motor readiness for learning. The INPP Developmental Screening Test and School Intervention Programme. Wiley-Blackwell. Chichester.
- [3] Burns, Y., M. O'Callaghan, B. McDonell, Y. Rogers, 2004. Movement and motor development in ELBW infants at 1 year is related to cognitive and motor abilities at 4 years. *Early Human Development*, 80: 19-29.
- [4] Bushnell, E.W., and J.P. Boudreau, 1993. Motor development and the mind: The potential role of motor abilities as a determinant of aspects of perceptual development. *Child Development*, 64: 1005-1021.
- [5] Cameron, C.E., L.L. Brock, W.M. Murrah, L.H. Bell, S.L. Worzalla, D. Grissmer, et al., 2012. Fine motor skills and executive function both contribute to Kindergarten achievement. *Child Development*, 83: 1229-1244.
- [6] Diamond, A., 2000. Close Interrelation of Motor Development and Cognitive Development and of the Cerebellum and Prefrontal Cortex. *Child development*, 71: 44-56.
- [7] Grissmer, D., K.J. Grimm, S.M. Aiyer, W.M. Murrah and J.S. Steele, 2010. Fine motor skills and early comprehension of the world: Two new school readiness indicators. *Developmental Psychology*, 46: 1008-1017.
- [8] Jongmans, M., B. Engelsman, M. Schoemaker, 2003. Consequences of Co morbidity of Developmental Coordination Disorders and Learning Disabilities for Severity and Pattern of Perceptual-Motor Dysfunction. *Journal of learning disabilities*, 36: 528-537.
- [9] Luo, Z., P.E. Jose, C.S. Huntsinger and T.D. Pigott, 2007. Fine motor skills and mathematics achievement in East Asian American and European American kindergartners and first graders. *British Journal of Developmental Psychology*, 25: 595-614.
- [10] Murray, G.K., J. Vejjola, K. Moilanen, J. Miettunen, D.C. Glahn, T.D. Cannon, et al. 2006. Infant motor development is associated with adult cognitive categorisation in a longitudinal birth cohort study. *Journal of Child Psychology and Psychiatry*, 47: 25-29.
- [11] Pagani, L.S., C. Fithpatrick, I. Archambault and M. Janosz, 2010. School readiness and later achievement: A French Canadian. replication and extension. *Developmental Psychology*, 46: 984-994.
- [12] Piaget, J., and B. Inhelder, 1966. *La psychologie de l'enfant [the psychology of the child]*. Paris, France: Presses Universitaires de France.
- [13] Piek, J.P., L. Dawson, L.M. Smith and N. Gasson, 2008. The role of early fine and gross motor development on later motor and cognitive ability. *Human Movement Science*, 27: 668-681.
- [14] Pieters, S., A. Desoete, H. Roeyers, R. Vanderswalmen, H. Van Waelvelde, 2012. Behind mathematical learning disabilities: What about visual perception and motor skills? *Learning and Individual Differences*, 22: 498-504.

- [15] Son, S., S. Meisels, 2006. The relationship of young children's motor skills to later reading and math achievement. *Merrill-Palmer Quarterly*, 52: 4.
- [16] Viholainen, H., T. Ahonen, P. Lyytinen, M. Cantell, A. Tolvanen and H. Lyytinen, 2006. Early motor development and later language and reading skills in children at risk of familial dyslexia. *Developmental Medicine & Child Neurology*, 48: 367-373.
- [17] Woodard, R.L., and P.R. Surburg, 2001. The performance of fundamental movement skills by elementary school children with learning disabilities. *The Physical Educator*, 58: 198-206.
- [18] Zhang, J., 2001. Fundamental motor skill performances of children with ADD, LD, and MMR—a pilot study. *Palaestra*, pp: 7-9.