



## Sociology of Education

### Comparing the Effectiveness of Perceptual Motor Training and Working Memory on Auditory Processing and Comprehension in Children with Learning Disabilities

Zahra Ghasemzadeh<sup>1</sup>, Hosein Bigdeli<sup>2\*</sup>, Mohammad Bagher Hobbi<sup>3</sup>

1. PhD student in Educational Psychology, Department of Psychology, North Tehran Branch, Islamic Azad University, Tehran, Iran.
2. Assistant Professor, Department of Psychology, Tehran East Branch, Islamic Azad University, Tehran, Iran.
3. Assistant Professor, Department of Psychology, North Tehran Branch, Islamic Azad University, Tehran, Iran.

❖ **Corresponding Author Email:** hobigdeli@yahoo.com

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#### Abstract

**Purpose:** The present study was conducted with the aim of determining the difference in the effectiveness of perceptual-motor training and working memory on listening processing and reading comprehension in children with learning disabilities.

**Methodology:** The present research method is semi-experimental and the design used in this research (two-group pre-test-post-test design) is two experimental groups. The statistical population of this research included all fifth and sixth grade children with learning disabilities who referred to counseling centers in 2022. 30 children with learning disabilities who met the criteria for entering the research were selected by available sampling method and were equally and randomly divided into two experimental groups and one control group. The first experimental group underwent active memory training including 16 training sessions and the second experimental group underwent perceptual-motor training in 16 sessions and the control group remained waiting without any intervention during this period. The research tools include Fisher's list of hearing problems and Cloze's test. The data analysis of this research was done in two descriptive and inferential parts (covariance analysis) using SPSS-23 software.

**Findings:** The results showed that both perceptual-motor training and active memory interventions are effective on auditory processing and reading comprehension in children with learning disabilities, and there is a significant difference between the effectiveness of these two treatments in the components of discrimination and auditory acuity. Based on this, it can be said that the rate of increase in the perceptual-motor training group in the components of discrimination and listening acuity was higher than that of the working memory training group. Also, the results indicated that there is no significant difference between the components of auditory processing and reading comprehension in the post-test stage compared to the follow-up stage, which means that the effectiveness of these two treatments in the follow-up stage has been permanent.

**Conclusion:** perceptual-motor training and active memory played a significant role on auditory processing and reading comprehension in children with learning disabilities and led to improvement in these children



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## Detailed abstract

**Purpose:** Specific learning disability is a neurodevelopmental disorder of biological origin, that is, the basis of its abnormalities is at the cognitive level. According to the fifth statistical and diagnostic manual of mental disorders, the prevalence of specific learning disorders in the educational fields of reading, writing and mathematics is 5-15% in school children or in different cultures, societies and languages. Students with special learning disorder succeed much less than what is expected for their age and intelligence level, and without special help, they usually perform poorly, their friends and family members consider them weak, and as a result, their self-esteem and motivation are very low. Also, dropping out of education is more common in children with learning disorders and these people also have problems in their communication and social functioning. In recent years, the subject of learning disorders has received great attention from education experts. In fact, learning disability is a general term for a heterogeneous group of disabilities that manifest through obvious problems in acquiring and using listening, speaking, reading, writing, reasoning or mathematical skills. People who have learning disabilities, especially in the non-verbal field, are associated with a variety of neuro-psychological deficits in the sensory-motor processing system and cognitive coordination during childhood, and as a result, academic, emotional and social performance is impaired. One of the problems of children with learning disabilities in primary school, which shows itself in dictation, is weakness in auditory processing and discrimination. A child who has a weakness in auditory discrimination usually repeats these types of mistakes in dictation that he cannot correctly recognize close or similar sounds. In general, people differ widely in terms of how they process audio information. This perceptual ability, collectively referred to as general auditory processing, consists of two distinct constructs: a) the extent to which individuals can hear the very fine acoustic details of sounds, and b) how well they can transform perceived information into motor action. Auditory processing disorder refers to problems related to the processing and understanding of auditory information in the central nervous system with poor performance in one or more of these skills: auditory discrimination, auditory pattern recognition, integration, sound localization and orientation, coverage and temporal order, and performance. Hearing impaired against auditory signals. Also, children with learning disorders face challenges in cognitive processes such as processing speed, attention and working memory. The present study was conducted with the aim of determining the difference in the effectiveness of perceptual-motor training and working memory on listening processing and reading comprehension in children with learning disabilities.

**Methodology:** The present research method is semi-experimental and the design used in this research (two-group pre-test-post-test design) is two experimental groups. The statistical population of this research included all fifth and sixth grade children with learning disabilities who referred to counseling centers in 2022. 30 children with learning disabilities who met the criteria for entering the research were selected by available sampling method and were equally and randomly divided into two experimental groups and one control group. The first experimental group underwent active memory training including 16 training sessions and the second experimental group underwent perceptual-motor training in 16 sessions and the control group remained waiting without any intervention during this period. The research tools include Fisher's list of hearing problems and Cloze's test. The data analysis of this research was done in two descriptive and inferential parts (covariance analysis) using SPSS-23 software.

**Findings:** The results showed that both perceptual-motor training and active memory interventions are effective on auditory processing and reading comprehension in children with learning disabilities, and there is a significant difference between the effectiveness of these two treatments in the components of discrimination and auditory acuity. Based on this, it can be said that the rate of increase in the perceptual-motor training group in the components of discrimination and listening acuity was higher than that of the working memory training group. Also, the results indicated that there is no significant difference between the components of auditory processing and reading comprehension in the post-test stage compared to the follow-up stage, which means that the effectiveness of these two treatments in the follow-up stage has been permanent.

**Conclusion:** Perceptual-motor training and active memory played a significant role on auditory processing and reading comprehension in children with learning disabilities and led to improvement in these children. This research was conducted in Tehran and in generalizing its results to other conditions, attention should be paid to the situational similarity and cultural differences. Due to the fact that the statistical population of this research is a small part of the society and consists of a number of children in the fifth and sixth grade of elementary school in a specific and limited period of time, in generalizing the findings to other members of the society, attention should be paid to the limited and specific nature of the sample. In this research, the only tool used was a questionnaire, which can be subjected to carelessness, lack of enthusiasm or personal perceptions of the subjects. In order to be sure about the results of this research, it is suggested to carry out more extensive research in larger societies and on different gender groups to enable comparison between girls and boys. According to the results of the present study and also other studies that have been conducted in the field of confirming the effectiveness of perceptual-motor training on improving the performance of children with learning disabilities in various fields, it is suggested that the perceptual-motor program be designed based on sports standards and finally, this The plan should be implemented in all schools of the country. In this way, at the beginning of each academic year, a plan to measure memory and perceptual-motor ability and identify children with learning disabilities will be held so that these children are identified and treated from the very beginning. It is suggested that in the form of in-service courses, appropriate methods of teaching active memory of children with learning disabilities should be given to teachers, and special and free training should be given to the parents of these students to try to improve the performance of these children.