World Essays Journal / 1 (2): 71-74, 2014
©2014Available online at www. worldessaysj.com
ISSN 0000 ©2014 WEJ Journal

Comparison of normal and mentally retarded children's Neuro Cognitive Executive Functions

Seyed Mohammad Hossein [1], Mojtaba salmabadi [2], Ali Gholami Estend [3], Aboljazl Bahari [4]

[1] Professor Department of Educational Sciences , Farhangian University, Birjand, Iran
[2] M.A student, Family Counseling, Allameh Tabataba'i University, Tehran, Iran
[3] MA student, Educational Psychology, Allameh Tabataba'i University, Tehran, Iran
[4] MA student in pre-school education, Allameh Tabataba'i University, Tehran, Iran

Abstract: The present study is done aimed to compare the performance of normal and mentally retarded children with neurodevelopmental implementation. The present studu is a Causal-comparative study, that 70 normal children randomly and 70 children mentally retarded in cluster random sampling of schools were selected from Birjand and then were evaluated using a personality questionnaire and underwent neuropsychological assessment Coolidge, resulted Data was tested using two-way ANOVA test. The results showed that there is a significant difference in application of neuropsychological functions between normal and mentally retarded children. Mentally retarded children, in neurological functions are more impaired to normal children in the application and require more and more attention.
Keywords: Mental retardation; normal; Neuro Cognitive Executive Functions

Introduction

Although mankind in present century has made and developded new and advanced technology for his welfare, he failed to provide for himself as much mental happiness and well-being. There are various problems in life that can reduce the amount of happiness and well-being of life. Among these issues we can mention disabilities. One of these disabilites that severely affects the families is birth of child with mental retardation (Health and Mqtdayy, 2012). Mental retardation is one of the largest, most complex and most difficult problems of children and adolescents in modern societies (Luckasson & Reeve, 2001). By definition of American Association on Mental Retardation (AAMR), mental retardation is a level of general intelligence that performance levels significantly (two standard deviations) are lower than average, at the same time associated with deficits in adaptive behavior(Compromise specificity of individual and social) will appear in growth period (spermatogenesis up to 18) (Judith & Schilling, 2003).

One of the problems of mentally retarded children or learning disabilities, is Neuro Cognitive Executive Functions that is among the necessary abilities of children to learn in school lessons (Kirk et al., 2006).

Executive Function is a higher Cognitive Function and Metacognitive that encompass excellent set of Capabilities, Inhibition, Self- Initiation, Strategic planning, cognitive flexibility and impulse control (Alizadeh, 2006). Actually the functions such as organization, decision-making, Working Memory, Maintenance and Shift of Motor control, Time Sensation and Perception, Predicting the future, Reconstruction, inner language and problem solving can be considered the most important Neuro Cognitive Executive Functions that help people in life and homework learning and intellectual activity (Barkley, 1998; Welsh & Pennington, 1988).

Neuro Cognitive Executive Functions are important structures that are responsible for controlling the psychological processes of consciousness and thinking linked in practice. Although executive functions have been studied primarily from a neurological perspective, in recent years the development and pathology of it has attracted the attention and interest of many experts (Zelazo & Muller 2002). Cognitive Executive Functions are mainly managed with frontal lobm and cause new discovery, planning, strategy, performance monitoring, use the feedback to adjust the response and containment alert information not relevant to the task. Executive function, has a prominent role in the skills and activities planning, working memory, emotional control, control, transfering and starting and keeping. Impaired executive functions including retained in place, the failure or inability to inhibit are inappropriate responses (Pentalliss et al., 2002).

The purpose of the move and the other executive functions play an important role in motor control (Barkley, 1997). Therefore, there are considerable difficulties in motor coordination, writing, fine motor and movement of large and impaired perception of time raises the possibility that Perhaps children with mental retardation, such as children with attention deficit / hyperactivity (combined type) have problems with executive functions. Several studies, have shown the poor performance of executive function and attention in children with learning disabilities (Abedi et al., 2008). For example Swanson & Jerman (2007) in their research have shown that preschool children have lower performance with learning disabilities compared with normal children on tests measuring executive function and attention.

Little research has been done in the field of Neuro Cognitive Executive Functions. For example, Alizadeh and pour Zahedi (2004), showed in a research that Children with developmental coordination disorder were different with normal group in executive functions organization and decision-making- planning but No significant difference was observed in the inhibition function. The Zarei Zavarak, (2001) showed in a study that there is a significant difference between the Neuro Cognitive Executive Functions of children with specific learning disabilities and normally. Meanwhile, Gamari Givi et al (2009) found in a study that there is a significant difference between children with executive functions in children with attention deficit hyperactivity disorder, learning disabilities and normal children. In this regard Abedi et al (2008) showed that differences in executive function and attention in children with learning disabilities and normal children are significant.

Generally, most researchers agree that the executive functions, are self-regulation and show the child's ability to prevent, change, planning, organization, use of working memory, problem solving and goal setting for homework and school activities (Willcutt et al., 2005). For example, one of the executive functions, is inhibition in children with learning disabilities and children with Attention deficit hyperactivity is deficient (Pennington, 2005). Control partial inhibition could jeopardize the ability of working memory and lead to working memory corruption and interference in planning and organizing children in their behavior (Valera & Seidman, 2006).

According to this matter that there is not a research that evaluates and compairs the corrolation of their research and in this area a research gap is felt, the purpose of this study is to fulfill part of this gap. On the other hand, the common goal of all modern research in the field of mentally retarded children is to help resolve problems and provide solutions for education, treatment, rehabilitation and achieve independence, social and job of these people. The aim of the present study is to investigate and compare the performance of the application neurological normal and mentally retarded children in primary school. Therefore, this hypothesis was tested that is there any significant difference between normal and mentally retarded children's Neuro Cognitive Executive Functions?

Method

The present study is a causal-comparative study. The population of this study is consisted of all students in the elementary boys and girls of primary school Birjand in 2011. Subjects of the study were consisted of a group of 70 male and female elementary schools that were randomly selected the other group were selected random cluster, so that the school boys and girls from three points of Birjand city (north, Mrkzjnvb), 8 schools were randomly selected and then the two groups were matched on the basis of more than 13 persons, including age, gender, birth order. After screening the students neuropsychological and personality questionnaire (Coolidge, 2002), the interview was conducted by researchers with the participants. For the analyzing the present data in the level of discriptive statistics, the mean and standard deviation is used and for comparision of Neuro Cognitive Executive Functions the two-way analysis of variances was used.

Tools

Coolidge Neuropsychological and personality questionnaires (2002): This test measures several neuropsychological and behavioral disorders in children and adolescents aged 5 to 17. Each disorder has a distinct and separate subscales that two of the subscales deals with 19 items to assess executive function. The test is responded by parents and by the means of Lycert scale. The two subscales measure executive functions in three areas of organizing, planning and decision. The questionnaire was translated for the first time by a doctor Hamid Alizadeh. Reliability and validity of the research have approved, including research Alizadeh and Zahedi Pour. The reliability of that is reached from the subscales of organizing and planning decisions 85/0 and for small scale inhibition Gyry- 66/0, respectively (Alizadeh and pour Zahedi, 2004). In the present study, Cronbach's alpha reliability of the method was 96/0.

Finding

In the descriptive statistics of this study frequency, mean and standard deviation is used, the data obtained are shown in Table 1.

Table 1. Descriptive findings related to the applications of executive neuropsychology

group	sex	number	Sex	Standard deviation
Normal	Girl	35	76.50	11.02
	Boy	35	79.76	20.25
	Total	70	78.08	16.14
Mental Retardation	Girl	35	101.74	22.70
	Boy	35	109.80	25.70
	Total	70	105.77	21.41
Total	Girl	70	88.94	21.74
	Boy	70	95	27.54
	total	70	91.93	24.86

As Table 1 indicates the highest average (109/80) is related to the mentally retardation male children and the lowest mean (76/50) to normal female children. Generally, grade point average of mentally retardation children (88/94) is lower than the grade point average of normal children (88/94).

Table 2. Two-way analysis of variance on the application of neuropsychological functions

Source changes	Sum of squares	Degree of freedom	Sum of squares	frequency	The significance level of P
Group	26726	1	26726.23	62.93	0.000
Gender	1121/15	1	1121/15	2.64	0.107
Sex and group Interaction	200/88	1	2000/88	0.47	0.493

Conclusion

The present study was done aimed to compare the performance of the application neurological normal and mentally retarded children. Executive functions and attention to inhibition of impulsive responses, auditory and visual selective attention, planning, problem solving, adaptability, maintainability, and the ability to set the inhibition of impulses, measures in order to create a coordinated response to an opposite stimulus.

The results showed that the performance of mentally retarded children in the application of neuropsychological functioning was significantly weaker than that of normal children. This finding is consistent with previous results including (Waller and Sydmn, 2006; Swanson et al., 2006; Swanson and Germain, 2007). This is largly due to factors in causing mental retardation factors for antenatal, birth and postnatal environmental conditions governing the retarded child's life.

The key findings of the present study was that children should dominate on some skills such as the Neuro Cognitive Executive Functions, including organizing, decision - planning and inhibition to do homework. These skills are internalized processes and children use them in problem solving, learning and observation. The skills, are achieved from experience, education and learning. Most typical children use these skills automatically, but mentally retarded children have difficulty when using these skills and need for training in this area. Many studies have shown that impaired executive function in preschool children, largely are a predictor of academic performance in school and so there is need for early detection and intervention in this group of children. In other words, perfect executive functions in normal and mentally retarded children later in life, sustained and cause serious problems for children with homework. So this group of children need early diagnosis and intervention to learn necessary skills for success in future school learning.

The second finding of present study showed that there is a significant difference between normal and mentally retarded children's Neuro Cognitive Executive Functions. This finding is consistent with previous research, including (Alizadeh and pour Zahedi, 2004; Zarei Zavarak, 2004; Ghamari Givi et al., 2009; Abedi et al., 2008). Overall, the findings of this study help to describe some of the research findings on neurological features of these children. For example we can understand bether about some mobility problems of these children in the new motor positions (Geuze, 2005) Reliance on external feedback (Smiths et al., 2003) due to injury executive functions.

The findings of this research with regard to its limitation need serious attention. Given that the study population was children in Birjand, One limitation of this study is this matter that we should be cautious in generalizing the results to other areas of the city and the country. Also, since this study was conducted in about children with mental retardation, we should be cautious in generalizing the results to other age groups. In the end, it is suggested that future researchers use executive function tests, such as the Tower of London test or Stroop cards that have the opportunity to view more, in their study of assessing their functional performance. It is also recommended that executive functions in different groups of mental retardation review with higher intensity. In this way we can obtain a better understanding of the damage potential in this area.

Resources

- Abedi, Ahmad, Malik, A. M., Rumi, Hussein, widescreen, HR, Amiri, Shole. (2008). Compare attention and executive function in preschool children with learning disabilities neuropsychological / development of normal children, Journal of Cognitive Science News, Vol. I, No. 2.
- Alizadeh H. (2006).The relationship between cognitive neural executive functions and developmental disorders. Journal of new cognitive sciences; 4: 40-57. (Persian)
- Alizadeh, Hamid and Zahedi Pour, Mehdi. (2004). Executive functions in children with developmental coordination disorder and fresh Psychological Science, Vol. 6, No. 3, 4, 56-49.
- Barkley RA.(1998.) Attention-deficit hyperactive disorder: A handbook for diagnosis and treatment. 2 ed.New York: Guilford;: 303-6.
-Barkley, R. A. (1997). ADHD and the nature of self-control. New York: Guilford.
-Coolidge, F. (2002). The Coolidge Personality and Neuropsychological Inventory for Children: The CPNI. Colorado: University of Colorado at Colorado Springs.
-Geuze, R. H. (2005). Postural control in children with developmental coordination disorder. Neural Plasticity , 12,183-196.
- Givi, Hossein; Narimani, M., Rabie, Zh. (2009). Comparison of executive functions in children with attention deficit hyperactivity disorder, learning disabilities and normal children, Journal of Mental Health, Vol. 11, No. 4, 333-322.
-Judith A, Schilling Mc.(2003.) Psychiatric Nursing. Philadelphia: Lippincott. Williams & Wilkins; p. 93-5.
-Kirk, S. A., Gallagher, J. J., Anastasiow, N. J., & Coleman, M. R. (2006). Educating exceptional children.Boston: Houghton Mifflin.
-Luckasson R, Reeve A.(2001) .Defining, and classifying in mental retardation. Ment Retard; 39(1):47-52.
-Pennington, B. F. (2005). Toward a new neuropsychological model of attentiondeficit/hyperactivity disorder: Subtypes And multiple deficits.Biological Psychiatry, 57,1221-1223.
- Pentalliss, S., F., Gudleski, G., D., Saladin, M., E., & BK.,T.(2002).“Impulsivity and rapid discounting of delayed hypothetical rewards in cocaine-dependent individuals”. Experimental and Clinical Psychopharmacology, 11(1):pp18-25
- Salamat, M. and Moghtdaii, Kamal. (2012). The effectiveness of life skills training on quality of life and psychological symptoms in mothers of children with mild mental retardation in primary Dehaghan third national conference of lawyers, city Khomeini, Islamic Azad University of Khomeini.
- Smits-Engelsman, B, C., Wilson, P. H., Westenberg, Y., & Duysens, J. (2003). Fine motor deficiencies in children with developmental coordination disorder and learning disabilities: An underlying open-loop cntrol deficit. Human Movement Science, 22, 495-513.
-Swanson, L. H., & Jerman, O. (2007). The influence of working memory on reading growth in subgroups of children with reading disabilities. Journal of Experimental Cild Psychology, 96(4), 249-283.
-Welsh MC, Pennington BF.(1988). Assessing frontal lobe functioning in children: Views from developmental psychology. Dev Neuropsychol; 4: 199-230.
-Willcutt, E. G., Doyle, A. E., Nigg, J. T., Faraone, S. V., & Pennington, B. F. (2005). Validity of the executive function theory of attention-deficit/hyperactivity disorder: A meta-analytic review. Biological Psychiatry, 57, 1336-1346.
-Valera, E. M., & Seidman, L. J. (2006). Neurobiology of attention-deficit/hyperactivity disorder in preschoolers.Infants and Young Children, 19(2),94-108.
-Zelazo PD, Muller U. (2002).Executive functions in typical and atypical development. Oxford: Blackwell, 511-21
-Zarei Zavarak, Ishmael. (2001). Children with specific learning disorders, neurological function compared with normal children, thought and behavior, year 7, 1 and 2.