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

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Abstract: The present study is done aimed to compare the performance of normal and mentally retarded children with neurodevelopmental implementation. The present study 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 developed 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 disabilities that severely affects the families is birth of child with mental retardation (Health and Mqtday, 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 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 lobes 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, transferring 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 correlation 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, Mركزجvn ب), 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 descriptive 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.
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

<table>
<thead>
<tr>
<th>Source changes</th>
<th>Sum of squares</th>
<th>Degree of freedom</th>
<th>Sum of squares</th>
<th>frequency</th>
<th>The significance level of P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td>26726</td>
<td>1</td>
<td>26726.23</td>
<td>62.93</td>
<td>0.000</td>
</tr>
<tr>
<td>Gender</td>
<td>1121/15</td>
<td>1</td>
<td>1121/15</td>
<td>2.84</td>
<td>0.107</td>
</tr>
<tr>
<td>Sex and group</td>
<td>200/88</td>
<td>1</td>
<td>2000/88</td>
<td>0.47</td>
<td>0.493</td>
</tr>
</tbody>
</table>

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 largely 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 better 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


