

The role of executive functions on students' academic achievement

Ali Shabanzadeh

Master of Educational Psychology, Department of Educational Sciences, Faculty of Humanities, teaching Shahid Rajaei University, Tehran, Iran
Alish44@yahoo.com

Sadegh Nasri

Associate Professor, Department of Educational Sciences, Faculty of Humanities, teaching Shahid Rajaei University, Tehran, Iran
Sadegh_nasri@yahoo.com

Majid Ibrahim Damavandi

Lecturer, Department of Educational Sciences, Faculty of Humanities, teaching Shahid Rajaei University, Tehran, Iran
Ons20@yahoo.com

Abstract

The present study was conducted with the aim of the role of executive functions on the academic achievement of students in Mahdishahr. The statistical population of the study included 1559 people (746 girls, 813 boys). then 397 people (202 girls - 195 Boys) through regular random sampling) were systematically selected . to collect data were used from the Nervous QuestionnaireCognitive college (Alizadeh and Zahedipour, 2005) as well as the end grades of the second semester of the 2019_2020 academic year. To Research data were analyzed using t-test, structural equations, descriptive statistics, correlation coefficient. Results Data analysis through Pls Smart software showed that there is a relationship between executive function and academic achievement. Furthermore, the findings showed that the components of executive functions are effective predictors of academic achievement of first high school students. the executive functions explain 0.147 of variance of academic achievement and the proposed model has a suitable fit.

Keywords: Executive Functions, Academic Achievement, College Neurological Questionnaire

INTRODUCTION

Students' academic achievement is one of the important indicators in the evaluation of education and all efforts in this system. fact is that the effort for the society is to act on this matter. The whole society in general, the education system in particular Is interested in and concerned about the fate of children, their successful growth and development, and their place in society, and expects students develop and excel in Various aspects, including cognitive dimensions and acquisition of skills and abilities, as well as emotional dimensions (Pourshafei, quoted by Moradi, 2012).

Academic achievement is important because school achievement has an effect on learning and school learning has progress Affects the

academic and the teacher to increase the level of motivation of students to learn different subjects, It should try to improve the learning conditions and increase the quality of education so that students can succeed ,And gain confidence in their ability to learn (Seif,2013). Academic achievement means that the level expected education and bring the education organization closer to the predetermined goals. Achievement That is increasing the level of learning, increasing the level of grades and acceptance of students in courses and grades.

Today academic achievement of Students have been considered as an important indicator for evaluating educational systems. In addition, progress Education has always been important for teachers, students, parents, theorists and

educational researchers. For example, Learners' academic achievement is one of the most important owners of teacher performance appraisal. Average for students as well Education represents their scientific ability to enter the world of work and employment and higher education. Maybe because of that It is important to note that educational theorists have focused much of their research on recognizing factors affecting academic achievement (Quoting Saif and Attar Khamene, 2009).

One of the most important activities that children and adolescents are expected to do is work in the educational field. Sometimes academic success becomes the most important factor in evaluating a person to the extent that sometimes we encounter excessive in this regard, in the opinion of many educators and parents, a successful person is who in terms of academic achievement and educational scores be good luck. Parents in today's society strive for their children's academic success. They are in trouble along the way. They encounter that is not due to their inability and weakness, but shows their concerns and responsibilities.

Learning environment is an opportunity to imitate behaviors, gain motivation to progress and recognize your abilities from this perspective.

Academic success is considered as success in achieving as many different achievements and abilities as possible, along with the issue of obtaining a grade, Or the rank that the student gets is another part of the subject (Mousavi, 2007). Academic success is the result of a continuous performance and requires different features, each of which is required but may not be sufficient.(Mousavi, 2007).

Regarding the criteria of academic achievement, it can be said that academic achievement or success in different ways with different criteria Characterized. One of these criteria is the average of students in one semester and the calculation of their average in one year.

Another criterion is to determine academic achievement by calculating students' grades in a course. Alternatively, use the sum of the scores Courses are one year and the final criterion is to determine academic achievement in a few years or a course of study, If a score of one Course or average of a group of different courses in a specific subject area or average of different

courses, Owners for academic achievement, these owners will have diagnostic problems; Example of using a score The unit has less validity and reliability than a special course than a grade obtained based on a combination of several grades.

Applying the scores obtained from different courses of study in different subjects in order to obtain the grade point average of the class is a difficult and confusing issue.

Because such scores include scores that differ from courses and disciplines achieved and combined on a single scale, while each student can achieve different levels of progress.

In any subject (Mehrafrooz, quoted by Moradi, 2012).

For many years, researchers in education and social psychologists have conducted many studies on the effective factors and the students' academic progress has always been on their minds; Because academic achievement is thematic is especially important now all over the world and every year a large amount of budget is spent on education children and adolescents and many studies to examine various factors that can affect academic achievement, such as family, school environment and dedicated educational programs (Qajar, quoted by Moradi, 2012).

Study of factors effecting academic achievement is a complex issue; Because progress is a multidimensional element so subtle to physical growth, socially, cognitively and emotionally related students. In the past many researchers emphasized on the impact of mental and cognitive abilities and academic achievement. Academic achievement is used as one of the indicators of progress in the education system and the concept of homework and students' success in passing courses of a specific educational level or students' success in the matter learning content. The opposite is the educational decline, which is one of the problems of the education system, Various methods such as Students' failure to achieve the goals of the relevant educational levels, rejection and basic repetition education, early school leaving, unemployment and homework show in short, the achievement of educational goals with Express the term academic achievement.

Each community, according to the requirements, provides training for its young people and the achievements by gaining points and scores certainly measured. Academic success is measured by the sum of the scores obtained in all

courses, the requirement for academic success in addition to being in an educational environment, having a set of functions that include communication skills, problem solving, planning, behavior control and persistence in task solving. Many of these areas are not carefully evaluated and graded (Mousavi,2007). In traditional curricula, human knowledge education is considered only as a set of facts. Learners are required to memorize it parrot-like; but in new approaches, teaching is emphasized on goals such as perception, creating a connection between perception and reasoning and using the exploration process in problem solving to strengthen and expand students' conceptual and strategic knowledge. In today's world, good life requires the ability to organize, to choose, to reason, to make decisions, to plan and problem solving.

Education has a great mission to create such abilities in society. Domain progress of different sciences make inevitable the need for more and more sustainable information in a short time in the use of different skills. Therefore, identifying appropriate methods for academic achievement in different courses, transferring learning from one situation to another and also for faster and better learning of students and its optimal use of limited educational time are the duties of education and training specialists. Progress in education and adaptive behaviors in children depend on their executive capacity.

So that the abilities that exist in the executive function are good predictors of academic achievement as well as adaptive behaviors.

There is also a link between aspects of executive function and academic achievement that some research suggests have paid (Latzman,2010).

The term executive functions is a general term that encompasses a wide range of cognitive processes and behavioral abilities that includes the ability to solve problems, attention, working memory, control, impulse control, retention and conversion, verbal reasoning, planning and organizing(Tehrani Doost et al, 2005).

Executive functions impute to the cognitive affairs of the higher level of the individual such as will, thoughts purposeful, planned, self-aware and sustained behavior. These functions are very broad, but they include planning, organization, working memory, self-regulation, response inhibition, and acceptability(Dawson Guare,2004, citing Alizadeh, 2006). Also,

executive functions become a booklet of neurological skills that have directly related to growth of specific parts of the brain. These functions are among the tools children need in school lessons(Kerk, 2008). Also, defects in executive functions in children can persist at older ages and maintain in personal matters faces with a serious problem, therefore its essential that an intervention program be developed to improve that program rather than the necessary skills Learn to succeed in future academic learning. It can be said that one of the most important issue in educational systems is creating necessary conditions for academic success (Talebzadeh et al., 2011).

Executive functions are skills that help us decide what kind of activities or goals should be considered which ones to choose and how to organize and plan activities. Executive functions have two roles prominent in behavior: one involves the use of specific thinking skills to select and achieve goals, and the other role, help to make progress in solving problems. These functions help to identify an idea of the path to the target and the resources of the case need during goal achievement (Dawson & Guyer, 2006).

Apparently healthy growth of executive functions also play an important role In the development of children's social competition and their social and educational readiness to attend school and continue it (Dawson, 2004).

Components of executive functions that will be considered in the research are:

1. Organization: The ability to arrange or place objects according to the system (Krik,2005).

2. Planning- making decisions: the ability to develop a roadmap to achieve a goal or complete a task. Also the ability to decide about prioritizing (Dawson Guare, 2004).

3. Response inhibition: an indicator of "how" and "when" to perform normal behavioral functions (Loftiz, 2009).

Prevent a dominant response or refuse to respond in the previous way (Sergeant, 2008).

Today, there is clear evidence that executive functions play an important role in childhood learning. In Children between the ages of 7 till 14 who score lower on executive skills tests predicted in evaluating their curricula, typically performed below standard in their courses (Gathercole, Thompson, 2008).

Growth and training of executive functions seem to play a key role in capacity building Children in

social roles and also in their social and academic readiness to enter school.

It can be said that progress in education and adaptive behaviors in children depend on their executive performance capacities, so the abilities that exist in executive performance are good predictors of academic achievement as well as adaptive behaviors (Young, Latzman, Klark, 2010).

By examining the difference between executive functions in students with poor and strong performance, it is possible to intervene early and improve functions.

Contributed to their academic achievement and alleviated many of the students' academic difficulties due to deficiencies in these functions.

Awareness of teachers and parents about the impact of functions on academic achievement can also be a positive step to improve functions. Be executive and consequently improve academic performance.

Considering little research has been done on the functions in the field of education, we decided to study three components of executive functions in particular and the impact of these functions on junior high school students in terms of their academic achievement, by answering questions in regarding executive functions and its relationship with mathematics, Persian and science courses, accentuate the importance and role of executive functions in academic achievement and open a new horizon for those involved in education.

The main hypothesis

Executive function affects the academic achievement of junior high school students.

Sub-hypotheses

1. The executive function of response inhibition, affects the academic achievement of junior high school students.
2. The executive function of organizing has an effect on the academic achievement of junior high school students.
3. The executive function of decision-making has an effect on the academic achievement of junior high school students.

Research method

The present study is applied in terms of research purpose and descriptive in terms of data collection. For size and Collection of data used from the college questionnaire (for students / for parents) and the transcript scores of the second

half of the year 2019_2020 Academic students. Statistical population, all male and female high school students in the city Mahdishahr in the year 2019_2020, of which 397 people (202 girls and 195 boys) students was selected Systematic (regular) random sampling.

Kulij Brain Executive Function Questionnaire is a test that recognize several neurological and behavioral disorders in children and adolescents Up to 17 years old that each disorder has a distinct subscale, three of which are 19 item that evaluates the executive functions. The test is answered by parents and students on a Likert scale, evaluate these 3 subscales of executive functions in the three areas of organization, decision-making, planning and deterrence.

Reliability obtained for the subscale of organization and decision-making, 0.85 and for the subscale inhibition is reported to be 0.66.

The internal consistency of the two subscales was obtained using Cronbach's alpha of 0.91. Homogeneity internal obtained separately is reported for organizing 0.81, decision-making-planner 0.82 and inhibition 0.52 (Alizadeh and Zahedipour, 2005.) Therefore, in order to evaluate the content and face validity of this questionnaire, from the idea of the supervisor, other professors have been used in this regard and the validity of the questionnaire has been confirmed.

The tool for measuring academic achievement was the second exam of the 2019-2020 academic year for students of Persian literature, mathematics and science which was extracted from the exam book of each school. This test was made by a teacher.

According to Pintrich and De Groot(1990; To Quoted from Maroufi et al., 2014). teacher-made tests are more like regular school exams, as a research tool They are more suitable than standardized tests. The students 'parents' questionnaire was also used in this study to correlate be informed between the questionnaire of students and their parents. Therefore, in order to check the content and face validity of this questionnaire, in terms of Supervisor, other professors have been used in this regard and the validity of the questionnaire has been confirmed. Reliability achieved is reported separately for organization 0.87, decision-maker 0.86 and inhibition 0.59. Correlation obtained between the parent and student questionnaire was 0.92 which is an acceptable correlation and shows a strong relationship between two questionnaires. In order

to evaluate the content and face validity of academic achievement scores of male and female junior high school students, all the final exams (first / second semester) have been used by the educational departments of each course in the city and the validity of the exams has been confirmed.

Vote to check the reliability of the method of test correctors, exam papers of 30 people first high school students were corrected by two

teachers of mathematics, science and literature (city departments) that the coefficient.

The agreement between the two evaluators was higher than 85%, meaning that both the tests themselves and the method of correcting the tests were highly reliable.

Findings

Descriptive indicators related to the mean, standard deviation and correlation coefficients of the research.

Table 1 - Mean and standard deviation of research variables by male and female students

Standard deviation	Mean	Standard deviation	Mean	Variable
7/02	53/06	7/90	51/17	Academic Progress
3/14	16/95	3/28	16/46	Mathematics
2/95	17/67	2/90	17/25	Science
1/77	18/44	2/63	17/45	Persian literature
8/40	46/21	9/42	46/06	Executive Function
3/84	19/23	4/42	19/10	Planning-Decision making
4/07	19/49	4/27	19/52	Organize
1/69	7/49	1/67	7/42	Inhibition response

According to Table 1, the average of total academic achievement (including mathematics and Persian science and literature courses) and executive function (including the component

Decision-making, planning, organization and response inhibition) as well as the mean scores of research variables in both sexes

And the girl is almost equal.

Table 2 - Mean, standard deviation, skewness and elongation of research variables

elongation	skewness	Standard deviation	Mean	Variable
0/846	-0/751	7/51	52/13	Academic Progress
0/756	-0/722	3/21	16/71	Mathematics
0/840	-0/768	2/93	17/46	Science
0/883	0/753	2/29	17/95	Persian literature
0/889	-0/768	8/90	46/14	Executive Function
0/956	-0/811	4/13	19/17	Make decision _plan

0/898	-0/792	4/16	19/51	Organize
0/962	-0/818	1/68	7/45	Inhibition response

The results of Table 2 show that the mean of the components is not much different between male and female students. The amount of skewness index.

Also, the elongation of all research variables was between +1 and -1. This means that the distribution of scores of research variables was approx normal.

Table 3 - Correlation matrix of variables studied in the research

8	7	6	5	4	3	2	1	Variable
							1	Academic Progress
						1	0/929	Mathematics
					1	0/789	0/910	Science
			1	0/597	0/634	0/809		Persian literature
			1	0/361	0/372	0/385	0/408	Executiv function
		1	0/921	0/391	0/407	0/409	0/441	Make decisions -plan
	1	0/876	0/941	0/305	0/312	0/335	0/346	Organize
1	0/700	0/598	0/801	0/261	0/259	0/265	0/281	Inhibition respons

* P < 0/01

The results of Table 3 show that there is a positive correlation between the scores of mathematics, Persian and science with the

components of decision making, organization and inhibition.

Table 4 - Cronbach's alpha indices and composite reliability

Combined reliability	rho_A	Cronbach's alpha	Concealed variable structure
0/791	0/847	0/830	Response inhibition
0/876	0/895	0/843	Plan_make decision
0/890	0/864	0/895	Organize
0/915	0/863	0/861	Academic Progres

According to the results of Table 4, values higher than 0.7 for each structure indicate its appropriate reliability.

Table 5 - Checking AVE values for diagnostic validity

AVE	Structure	Number
0/561	Response inhibition	1
0/602	Planning. Make decision	2

0/614	Organize	3
0/783	Academic achievement	4

Diagnostic validity (AVE), calculated by PLS Smart software, means that each indicator has only its own structure, and their composition is such that all structures are well separated from each other.

According to Table 5 It is observed that the obtained structures have a value of extracted variance (AVE) higher than 0.50.

Table 6 - Validity index for sharing hidden variables

Credit index (Q ²) subscription 1- (sse / sso)	Total squares Prediction error Sse	Total squares observed Sso	Variable
0/229	129/856	168/363	Response inhibition
0/345	333/914	510/144	Plan_make decision
0/352	322/676	497/899	Organize
0/560	85/318	177/506	Academic achievement

Based on the results of Table 6, it is observed that the verification index of the validity of the sharing of hidden variables is a positive number for all structures.

Therefore, the developed model has good adequacy.

Table 7 - Explain the amount of variance of owner variables

R ² adjusted	The value of R ²	Criteria variables
0/489	0/490	Response inhibition
0/886	0/887	Plan.make decision
0/855	0/855	Organize
0/095	0/095	Academic achievement

The proposed research model has been able to withstand independent variables of at least 50% (response inhibition) and up to 88% Plan.make decision. According to the values in the table, the average index is considered to fit the mode.

Finally, after confirming the adequacy and appropriateness of the model, the direct effects and total research variables are investigated.

Table 8 - Route coefficients, T statistics are related to structural equations.

Result	Amounts T	Coefficient Path(B)	Path title	Row
Confirm	5/110	0/742	Decision Making -> Planning -> Academic Achievement	1
Confirm	3/620	0/475	Organize-> Academic achievement	2

Confirm	2/155	0/363	Inhibition of response-> academic achievement	3
Confirm	3/620	0/662	Organize -> Academic progress of mathematics course	4
Confirm	3/465	0/626	Organizing -> Academic achievement of science course	5
Confirm	3/460	0/598	Organizing -> Academic achievement of literature course	6
Confirm	5/464	0/769	Intimacy-> Planning-> Academic achievement in mathematics	7
Confirm	5/415	0/676	Decision-making-> Planning-> Academic achievement of literature course	8
Confirm	5/423	0/731	Decision-making-> Planning-> Academic achievement of science course	9
Confirm	2/261	0/452	Inhibition of response-> Academic achievement of mathematics	10
Confirm	2/190	0/387	Inhibition of response-> Academic achievement of science course	11
Confirm	2/010	0/356	Inhibition of response-> Academic achievement of literature course	12

Smart pls 3.2 software was used to examine the economic relations model.

Discussion and conclusion

The purpose of this study was the role of executive functions (response inhibition, organization,

decision making) on academic achievement (mathematics courses, Persian science and literature) in the junior high school students. The results of data analysis through Smart PLS software showed that there is relation between executive function and academic achievement. On the other hand, the findings showed that the components of pre-executive functions are effective predictors of academic achievement of junior high school students. Executive functions 0,147 of variance progression explains education and the proposed model had a good fit.

The difference between executive functions and academic achievement in students, align with the findings of Ball, Espi (2008) as well as Miller and Heinshaw (2010), John Bost, Patricia, Miller, Jack, Neglier, (2011), Lotzman, Kwick, Jung, and klark, (2010), Thompson and Gutterkel, (2007) Len et al. (2011), McCland et al. (2006), Jacob and Parkinson (2015).

Len et al (2015) showed that the components of executive functions predict academic achievement and with academic achievement is correlated.

Executive functions are a set of cognitive skills that come in separate components; But together and side by side They also work to meet educational and behavioral demands. Visa-Petra et al (2013) showed in their study that executive functions play a central role in maintaining and grading the development of academic skills and in general functioning in school and academic function should be considered as a prerequisite and correlated. Jacob and Parkinson (2015) also suggest research Numerous can be found that have intervened and improved comprehensive capabilities in executive functions.

Executive functions include the use of specific intellectual skills to select and achieve goals and contribute to Progress in solving problems.

As mentioned, the capabilities that exist in executive performance are good predictors for their academic achievement so with early interventions and teaching these functions to students, we can better help them and prevent academic problems that may not be due to student laziness. On the other hand, many experts believe that training of executive functions plays a key role in academic preparation. Confirmation of this hypothesis is confirmation of the statements.

Seidman (2006) Who believed that defects in executive functions in students could remain stable at older ages and keep them in do homework and personal affairs with serious difficulty. In other words, the impairment of executive functions in predictors Their academic performance is at school, so it is essential to prepare early intervention programs to improve it be seen to learn the skills needed to succeed in future academic learning. We also come to the words of Kirk (2006) Which considers executive functions as one of the capabilities needed by children in learning school lessons.

Difference between executive function of response inhibition on students' academic achievement align with the findings of Soltani Koohbani et al. (2013), Slois et al. (2004), Bull and Serif (2001) and McLean and Hitch (2001). In a study by Majid Mahmoud Alilou(2015) concluded that children with learning disabilities in mathematics compared to normal children in the executive function of inhibition response they have a higher number of errors, which means that these children are more responsive in the executive function of response inhibition than the normal function group are weaker.

Inhibition of response plays an important role in writing. A person who has difficulty with this function may be distracted and act impulsively, thus affecting academic performance and achievement. Ability to deter irrelevant responses is as one of the most important executive functions and directly related to self-regulatory goal-oriented behavior. (Avila And Parst, 2001). Nig, Balsky, Plag, and Rupley (2003) argue that children that have problem of inhibitions cannot ignore information that they do not need to access and abruptly stop a thought or action. Also incomplete inhibition control executive can jeopardize the ability of working memory and lead to the deterioration of children's working memory (Valera and Sidman 2006).

Given that stimulus selection, response selection, and response execution tasks each require inhibition at different stages of processing (Casey, Darsten, & Facila, 2001), therefore, because of the difficulty they respond to in detention, The school as well as their academic function face more problems.

Based on the Barclay inhibition model, it is assumed that the proper functioning of executive functions depend on equivalent to the proper functioning of inhibition in the cortex forehead

and forehead. In other words, when inhibition is difficult, other executive functions also will not work properly and the problems of these children in inhibition are related to the poor function of their forehead and forehead lobes.

Defects in this functions can be sustained at older ages and make it more difficult for a person to do their homework and personal tasks. Given that teaching skills related to these functions is effective in improving the academic performance of these children, so the diagnosis and timely intervention in their problems is essential.

The difference between the executive function of organization on academic achievement with the findings of Masterson and Evans (2005), Garner (2009) Meltzer(1996)(2006), Lotzman, Jung, Klark (2010), Meltzer, Roditi and Stanberg (2005), Meltzer (2006), Zimmerman (2001) and Lefranco (2006).

In explaining the obtained results, it can be stated that According to LeFranco (2006), if we can organize large amounts of information, it will be better able to store and retrieve, so the students who were better organized than the other students were better able to handle save and retrieve the material, so they performed better in exams. Confirming this hypothesis, according to Garner (2009) we find that short- and long-term planning skills improve with academic achievement, especially in higher grades.

Short-term planning helps to prioritize learning, and long-term lesson planning leads to graduation.

at a low level of cognitive organization prevents distraction, at a higher level this skill to individuals allows them to manage time effectively, control their priorities, and maintain task hierarchy.

Accordingly, this component should be taught to students to ensure their academic progress.

The executive function of decision-making has a positive effect on academic achievement. In explaining the above results can be said according to That decision-making is one of the abilities and functions of thinking, developing decision-making skills leads to an increase in the ability to think individuals and deeper understanding of issues. People who have more understanding will also be more successful in their academic functions.

Therefore, the role of decision making in academic achievement seems obvious. Krik (2002) Decision-planning, is ability arranging and placing the components in accordance with specific and predetermined principles(Quoted by Soltani Kuhbanani, 2005).

Dos, Nagliri, and Kibri also see decision-making as both leadership and behavioral guidance, especially when people encounter with a new situation. In a study by Mohammadi Azandariani (2011), it was concluded that there was a decision between the two groups there is a difference and people with higher academic performance in the variable of decision-making and planning compared to people with academic performance The bottom is stronger. The result obtained from this study is consistent with the results of the present study. The result of the research of Barkley and Brown(2010) which shows that students who have problems in the decision-making process can not avoid behaviors learn from their past and repeat their mistakes, That is, they can not make the right decisions for their work And are constantly failing. In this way, these people have problems in the cognitive area of activity. Also Stanbury (2007) on decision-making in children with learning disabilities states that this group of students can not determine the necessary steps to implement each project, collect resources sparsely and incoherently and collect them They do not categorize so that they can retrieve them and have to work hard to put different parts of the project together.

Masterson and Evans (2005) achieved similar results in this area, which confirms the results of the study.

This research faced limitations. Due to the prevalence of the virus, the prevalence of coronavirus and the restrictions imposed on This virus, instead of using Wechsler, Andre Rey, etc. similarity tests, from the questionnaire and grades of students' transcripts we used to reduce the opposition of parents and other relevant staff. Due to limitations, this research has three components of functions. It has been implemented and has not dealt with other components, and also the studied schools were almost at the same level in terms of educational level. (high homogeneity).

REFERENCE

Dalvand, Mir Hossein and Elahi, Tahereh, Working memory function in children with learning disabilities, Journal of Behavioral

Sciences, Volume 6, Number 213-220, 2012 Fall, Third.

Asli Azad, Moslem, Abedi, Ahmad, Yarmohammadian, Ahmad, The effectiveness of spatial relationships training on mathematical performance of male students with disabilities Math Learning Quarterly of Exceptional People, Volume 5, Number 7, Spring 2016, 11-129.

Soltani Kouhbanani, Sakineh, Alizadeh, Hamid, Hashemi, Janet, Sarami, Ghalreza, Soltani Kouhbanani, Sajede, The effectiveness of computer training on memory work on Improving Executive Functions and Mathematics Performance of Students with Mathematical Disorders Quarterly Journal of Exceptional People, Third Year, Issue .9-20, 2013 Fall, Eleventh

Narimani, Mohammad, Soleimani, Ismail, The effectiveness of cognitive rehabilitation on executive functions (working memory and attention) and academic achievement of knowledge students with Mathematical Disorders, Journal of Disabilities, Volume 2, Number 3, Spring 2013, 91-115.

Asadzadeh, Hassan 2009, Study of working memory capacity and academic practice among third grade middle school students in Tehran, Quarterly Journal of Education and training, number one, spring 2009,50-74

Khoda panah, Mojgan. Moradi, Alireza Performance of obese people in executive functions. Journal of Clinical Psychology, Second Year, 51-58, Spring 2012, 1st.

Abbasian Boroujeni, Rezvan, Rafiei, Saleh, Namazizadeh, Mehdi, Tejarat, Farshad, The effect of cognitive rehabilitation and purposeful motor games on memory Child labor with developmental coordination disorders. Journal of Rehabilitation Medicine, Ninth Volume, Second Issue, Summer 2020, 287-2297.

Firoozi, Setareh, 2010, The relationship between executive functions and the level of exam anxiety of fifth grade elementary students. Master Thesis. Allameh Tabatabai University.

Ebrahimi Ghavam, Soghari, 2013, Comparison of executive functions of reasoning, organization-planning and working memory with their learning levels

Adjustment for high school students in the academic year 2012-2013. Thesis for receiving a master's degree in psychology Educational.

Janeh, Mojdeh, Ebrahimi Ghavam, Soghari and Alizadeh, Hamid, Study of executive functions of reasoning, organizational planning and working memory in knowledge Students with and without Mathematical Disorders in Primary School of Tehran Province, Quarterly Journal of Exceptional Psychology, Volume 2, Number 5, Spring 2012, 21-42.

Mohammadi Azandariani, Roghayeh, 2011, Comparison of executive functions (reasoning, planning-organization, working memory) in high school students guidance with high and low level of anxiety in Eslamshahr city in the academic year 2010-2011, thesis for obtaining a master's degree, Kashan University.

Delavar, Ali, 2012, Research Methods in Psychology and Educational Sciences, Tehran, Doran Publishing.

Afifi, Hossein, 2011, Comparison of executive functions in delinquent and normal adolescents in Tehran, Master Thesis, Allameh University Tabatabai.

Mohammadi, Mahboubeh, (2013), Comparison of executive functions (planning organization, reasoning, working memory) in students with poor and strong performance, Tehran, Master Thesis, Allameh Tabatabai University.

Abkhodarestani, Parvin, Esteki, Mahnaz, (2016), The relationship between lateral dominance, executive functions and creativity with mathematical problems in elementary school students third and fourth grade. Master Thesis, Faculty of Psychology and Order Sciences, Islamic Azad University, Central Tehran Branch.

Jafari, Sedigheh, The role of mediators of executive functions and cognitive-social functions on the transfer of educational goals and academic achievement students. Master Thesis 2016, Al-Zahra University.

Hakimi Rad, Elham, Afrooz, Gholam Ali, Behpajoo, Ahmad, Ghojari Bonab, Baqer, Arjmandnia, Ali Akbar, The effectiveness of inhibition education programs and active Memory on Improving Social Skills of Children with Attention Deficit Hyperactivity

- Disorder, *Quarterly Journal of Psychological Studies*, Volume 9, Fourth Issue, Winter 2013, 11-29.
- Rustaman, Hassan, Talepasand, Siavash, Nazifi, The effect of teaching computer-based executive actions on executive performance and behavioral cues of children with Attention Deficit / Hyperactivity Disorder, *Journal of Clinical Psychology*, 2013, 93-106.
- Garcia, R. B., Mammarella, I. C., Pancera, A., Galera, C., & Cornoldi, C. (2015). Deficits in visual short-term memory binding in children at risk of non-verbal learning disabilities. *Research in developmental disabilities*, 45, 365-372.
- Beyrami, M., Peyman Nia, B., & Mousavi Giyah, E. (2014). Comparison of executive function in Students with Dyscalculia disorder and normal counterparts. *Biquarterly Journal of Cognitive Strategies in Learning*, 1(1), 15-29.
- Bull, R., & Lee, K. (2014). Executive functioning and mathematics achievement. *Child Development Perspectives*, 8(1), 36-41.
- Nikbakht, E., Abdekhodae, M. S., & Hasanabadi, H. (2014). Effectiveness of reality therapy group counseling program on academic motivation and procrastination. *Research in Clinical Psychology and Counseling*, 3(2), 81-94.
- Díaz-Morales, J. F., & Escribano, C. (2014). Consecuencias de la mayor vespertinidad durante la adolescencia para el funcionamiento psicológico: una revisión. *anales de psicología*, 30(3), 1096-1104.
- Iglesias-Sarmiento, V., López, N. C., & Rodríguez, J. L. R. (2015). Updating executive function and performance in reading comprehension and problem solving. *anales de psicología*.
- Bays, P. M. (2014). Noise in neural populations accounts for errors in working memory. *Journal of Neuroscience*, 34(10), 3632-3645.
- Motamedi, M., Bierman, K., & Huang-Pollock, C. L. (2016). Rejection reactivity, executive function skills, and social adjustment problems of inattentive and hyperactive kindergarteners. *Social Development*, 25(2), 322-339.
- Wong, T. T. Y., Ho, C. S. H., & Tang, J. (2014). Identification of children with mathematics learning disabilities (MLDs) using latent class growth analysis. *Research in developmental disabilities*, 35(11), 2906-2920.
- Maehler, C., & Schuchardt, K. (2016). The importance of working memory for school achievement in primary school children with intellectual or learning disabilities. *Research in developmental disabilities*, 58, 1-8.
- Taghizadeh, H., Soltani, A., MANZARI, T. H., & ZEINADDINY, M. Z. (2017). The structural model of the role of executive functions in learning performance of students with specific learning disabilities.
- Dehghani, Y., Afshin, S. A., & Keykhosrovani, M. (2017). Effectiveness of neuropsychological therapy on executive functions and educational performance of students with dyscalculia.
- Soares, N., Evans, T., & Patel, D. R. (2018). Specific learning disability in mathematics: a comprehensive review. *translational pediatrics*, 7(1), 48.
- Latzman, R. D., Elkovitch, N., Young, J., & Clark, L. A. (2010). The contribution of executive functioning to academic achievement among male adolescents. *Journal of Clinical and Experimental Neuropsychology*, 32(5), 455-462.
- McCloskey, G., Perkins, L. A., & Van Divner, B. (2008). *Assessment and intervention for executive function difficulties*. Routledge.
- Nikbakht, E., Abdekhodae, M. S., & Hasanabadi, H. (2014). Effectiveness of reality therapy group counseling program on academic motivation and procrastination. *Research in Clinical Psychology and Counseling*, 3(2), 81-94.
- Hadwin, J. A., Brogan, J., & Stevenson, J. (2005). State anxiety and working memory in children: A test of processing efficiency theory. *Educational Psychology*, 25(4), 379-393.
- ZOLFI, V., & REZAEI, A. (2015). The effect of working memory computer assisted intervention on mathematics anxiety, working memory and performance mathematics among students with mathematics learning disabilities.
- Javanmard, G., & Asadollahifam, S. (2017). Comparison of executive functions of mathematical learning disabled children with reading, writing learning disabled and normal children. *Neuropsychology*, 3(10), 39-50.
- Abedi, M. R., Sadeghi, A., & Rabiei, M. (2015). Standardization of the Wechsler Intelligence Scale for Children-IV in Chahar Mahal Va Bakhteyri

- state. *Journal of Psychological Achievements*, 22(2), 99-116.
- Watanabe, K., Ogino, T., Nakano, K., Hattori, J., Kado, Y., Sanada, S., & Ohtsuka, Y. (2005). The Rey–Osterrieth Complex Figure as a measure of executive function in childhood. *Brain and Development*, 27(8), 564-569.
- Noroozi Chaharghaleh, P., Hashemi Azar, J., & Sarami Forooshani, G. R. (2015). The comparison of neuropsychological function among emotionally abused and normal girl students. *Journal of Psychological Studies*, 11(2), 7-24.
- Moradpour, S., Rostamy-Malkhalifeh, M., Behzadi, M. H., & Shahvarani, A. (2015). The Study of the Relationship between Mothers' Anxiety with the Mathematical Performance and Students' Anxiety.
- Morales, J. F. D., & Barreno, C. E. (2014). Consequences of adolescent's evening preference on school achievement: a review. *Anales de psicología*, 30(3), 1096-1104.
- Gupta, P., & Sharma, V. (2017). Working memory and learning disabilities: A review. *International Journal of Indian Psychology*, 4(4), 111-121.