



*British Journal of Education, Society &  
Behavioural Science*  
4(4): 541-553, 2014

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## The Association between Behavior Rating Inventory and Academic Achievement among High School Students in Karachi-Pakistan

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### *Authors' contributions*

*This work was carried out in collaboration between both authors. Author SH designed the study, wrote the protocol, and wrote the first draft of the manuscript. Author UA performed the statistical analysis, reviewed the protocol and done proof reading of the study. Both authors jointly read and approved the final manuscript.*

Original Research Article

Received 6<sup>th</sup> September 2013  
Accepted 19<sup>th</sup> December 2013  
Published 14<sup>th</sup> January 2014

### ABSTRACT

**Aims:** The aim of this study was to investigate the relationship between Behavior Rating Inventory of executive functions and academic achievement of high school students. It was hypothesized that "The scores on Behavior Rating Inventory of Executive functions will be positively correlated with the scores on academic achievement test in all three areas (i.e. spelling, reading and arithmetic) in high school students".

**Study Design:** Correlational research design.

**Place and Duration of Study:** high school students with grade level of 7 and 8 were randomly selected from different schools of Karachi, Pakistan in 2009 and 2010.

**Methodology:** At the first stage of study permission was taken from the authors of different tests that were to be used in the study. After getting permission from school administration a sample of 100 (50 male and 50 female) students with grade level of 7 and 8 were randomly selected from various schools of Karachi-Pakistan. The age range of participants was from 12 to 14 years (mean age: 12.50; SD = .92). The participants were briefed about the purpose of the study for establishment of rapport. All participants were scattered by seating them randomly in order to control the corresponding and cheating factors. In order to ensure their willingness of voluntary participation in the study written consent was taken

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from them. They were asked to complete the demographic forms, after which the spelling subtest of Wide Range Achievement Test-III –WRAT-III (Wilkinson, 1993), and The Behavior Rating Inventory of Executive Function -BRIEF (Gioia, Peter, Guy, & Kenworthy, 2000) were administered on them in a group. However, the other two subtests i.e. arithmetic and reading were administered on each participant separately. The procedure for administration of all three subtests was followed according to the instructions given in the manual.

**Results:** For statistical analyses Pearson Product moment coefficient of correlation was calculated through SPSS version 12.0. Analysis indicated that the correlation between the scores on Behavior Rating Inventory of executive functions and academic achievement in all three areas i.e. reading, spelling and arithmetic is not statistically significant.

**Conclusion:** The findings concluded that the scores on Behavior Rating Inventory of executive functions are not associated with the scores on academic achievement of students, however specific component i.e. behavior regulation index (inhibit, shift and emotional control) does correlate with arithmetic achievement.

*Keywords: Academic achievement; executive function; high school students.*

## 1. INTRODUCTION

Executive functions are a collection of processes that are responsible for guiding, directing, and managing cognitive, emotional and behavioral functions particularly during active and novel problem solving. In current era, the field of neuropsychology has completed pronounced steps in monitoring the mind's intellectual structural design. One of the greatest and vital discoveries through research is the role of the frontal lobe that is the last and most complex brain section to be progressed, and which intervene the cognitive tasks. Investigation has revealed that the patients who have impairment in their frontal lobes frequently execute ordinarily in the testing of Intelligence as well as on the basic measures of the ability of attainment [1].

Cato et al. [2] documented in his research those deficits in higher-level cognitive abilities of patients suffering from frontal lobe impairments. They usually manifest difficulty in theoretical thinking, problem solving, reserve conception of establishment and multiple tasking in addition to flexibility of the cognitive activities. With reference to frontal lobes role in executive functions, Karatekin, Lazareff and Asarnow further explained the skills that are directed by executive functions including scheduling, problem resolving, making judgments, coding relative data about stimuli, operational memory, tactical and aimed behavior, intellectual thinking, perceptive flexibility, self-consciousness, making conclusions and adjustment to new conditions. They stated with support to available evidence that executive functioning comprises the frontal lobes, particularly the prefrontal cortex that advances between several phases of development process [3]. On the other hand with reference to intelligence Carpenter et al. [4] pointed out that existing intelligence testing does not ensure in-depth measurement of skills that are related to executive abilities. He stated that high IQ level does not guarantee flexible thinking i.e. an extremely bright individual can demonstrate in capacitating cognitive rigidity and limiting role bound behavior contrary to the expectation of others. Similarly, lower intelligence doesn't dismiss the possibility of good commonsense and creativity that lead to effective "over achievement" and an ability to conceptualize beyond the routine. Therefore, Executive functioning is currently a major considerate notion under investigation.

Further evidence on processes and skills involved in executive functions and related actions come from the study of Gioia, Isquith and Guy who concluded that executive functions is a wrapping word for a group of correlated processes such as thoughtfulness, obstructer mechanisms, functioning memory, flexibility, self-regulation, and scheduling. These skills are accountable for actions that are determined and aim-focused. Executive functions are also believed to be processes that are grouped together to consolidate intellectual deeds, manners, and feelings [5]. Carlson Moses & Claxtonc mentioned that from the beginning of the lifespan, executive functions starts progressing during the childhood and continuously mature throughout the course of development [6]. Moreover, Cooper-Kahn and Dietzel mentioned that the executive functions can be seen as the “conductor” of all cognitive skills that serve as a “command and control” task. It provides guidance in handling all types of life tasks for e.g. a research project, a paper for school or organizing a trip. Further in their article they explained that nowadays "executive functioning" has turned out to be a mutual consideration in schools as well as in psychology offices. In fact, these skills have been studied by neuropsychologists for many years [7].

Furthermore, as executive functions are found to be associated with a number of processes a study was carried out by Said, to investigate the correlation of Executive Functions, Metacognition, Study Strategies, and Self-Efficacy with academic performance of female students. Results revealed that contrary to the expectations executive functions, self-efficacy and self-reported study strategies did not predict academic performance [8].

Currently, there is a need to assess high school students for their ability to carry out executive functions adequately rather than to assess their rote-verbal skills merely. In this reference Delis in 2007 carried out a study on 470 children and adolescents. Results showed that the current evaluation system adopted by schools is based on rote-verbal skills which for many students who show excellent executive functions, serves as a road block to success. Because such students showed relative weakness in routine rote-verbal skills and this decreased their chances to take college entrance examinations. He noted that there were some serious deficiencies in educational system. He observed that the current system of examination does not take into account the depth assessment of executive functions for example abilities related to resolving out complications, establishment of ideas and abstract thinking. According to his observations, all the schools evaluate students on the basis of annual examinations and additional admission exams for instance SAT (Scholastic Aptitude Test) etc. If a need arises to assess an individual for a learning disorder or other cognitive problem, they are also given some achievement and intelligence tests. According to Delis, the typical customary school test, intelligent test and college admission analyses basically have same over all structures. Firstly, all of these different assessments concentrate extra on obtaining memorization of information and abilities; secondly they do not provide a mechanism to evaluate executive function [9].

Thus, with reference to the above discussed literature; the most important thing that should be considered is the continuous evaluation of these basic skills in children and adolescents. There is a dire need to explore *whether Behavior Rating Inventory of executive functions is associated with any specific academic skills or academic performance is associated with components of executive functioning?*

To answer these research questions this study was designed to find out the relationship of Behavior Rating Inventory of executive functions with academic achievement in reading, spelling and arithmetic, moreover we also aimed to investigate the association of metacognition index and behavior regulation index of Behavior Rating Inventory of executive

functions with academic performance. The findings of this study will be helpful in opening different new paths through which we can investigate and understand the role of executive functions in student's academic achievement in a better way. The basic purpose of this study is to identify the strengths of high school students in a different context by which they can strengthen their abilities towards success and will be able to perform as a more positive and beneficial part of society. As in our culture students who are not able to achieve certain levels of grades are labeled as failures though they are not. This new area of research will be beneficial in generating further scientific knowledge and ways of understanding mental health.

Keeping in view all the available literature and findings in order to investigate the relationship of the scores on Behavior Rating Inventory of executive functions with the scores on academic achievement test in students following hypothesis has been formulated "The scores on Behavior Rating Inventory of Executive functions will be positively correlated with the scores on academic achievement Test (i.e. reading, spelling and arithmetic) in high school students in Karachi, Pakistan.

## **2. METHOD**

### **2.1 Participants**

100 adolescents (50 male and 50 female students) with grade level of 7 and 8 and age range of 12-14 years (with the mean age of 12.5; SD=.92) was randomly selected from different schools of Karachi. The probability sampling technique was used to that every student had an equal chance of participation in the study. From every school two classes 7 & 8 were selected and after consultation their class teacher the numbers of students in whole class were listed out and every 10<sup>th</sup> student was selected from that list.

### **2.2 Description of measures**

#### **2.2.1 Demographic information**

Demographic information included participant's personal information including age, gender, educational level, socioeconomic status, birth order, number of siblings, marks obtained in previous exams, tuitions given and family system.

#### **2.2.2 Behavior rating inventory of executive function (BRIEF)**

The Behavior Rating Inventory of Executive Function (BRIEF), developed by Gioia, Peter, Guy, and Kenworthy, is an assessment of executive function behaviors at home and at school for children and adolescents aged 5–18. The questionnaire is administered on parent- and teacher- informants and takes 10–15 minutes to be administered, and 15–20 minutes to be scored. Other versions of the BRIEF measuring executive function in preschool children (BRIEF Preschool 3–5 years), school-age children using self-report (BRIEF Self-Report 13–18 years), and adults (BRIEF Adult 18–90 years) are also available. The BRIEF was developed in 2000 to address limitations in available rating scales of executive functions to examine children's qualitative behavioral expression of executive functions competence in real-world settings. Based on normative data on child ratings from 1,419 (815 girls and 604 boys) parents and 720 teachers from a representative distribution of socioeconomic status, the BRIEF provides a standardized way of asking multiple raters

about executive functions in daily life in a manner that is not disease specific. Because it is not disease specific, the BRIEF may be used to assess executive function behaviors in children and adolescents with an array of difficulties including learning disabilities, attention difficulties, brain injuries, developmental disorders, psychiatric conditions, and medical issues. It consists of two indexes: Behavior Regulation Index including inhibit, shift and emotional control. The second is Meta-cognition Index that measures working memory, initiate, plan, organization of material and monitor. By adding both indexes Global Executive Composite is obtained. It has two validity scales the negativity scale and inconsistency scale. Convergent and divergent validity with other measures of emotional and behavioral functioning has also been established. Questionnaire was based on Inter-rater reliability correlation and item-total correlations that shows highest probability of being informative. This inventory has highest test-retest reliability and internal consistency. The BRIEF has validated, with high test-retest reliability ( $r_s$  - .88 for teachers, .82 for parents) internal consistency (alphas - .80 - .98), and moderate correlations between parent and teacher ratings ( $r_s$  - .32 - .34) [10].

For this research the Internal consistency of the present data was calculated and the coefficient for all the items of our sample ranging from .405 to .842 ( $p < .000$ ). For the whole sample the values for Inhibit is .619, Shift is .582, Emotional Control is .598, Monitor is .405, Working Memory is .607, Plan/Organize is .842, Org. of Materials is .504 and Task Completion is .582 ( $p < .05$ ) [11].

### **2.2.3 Wide range achievement test (WRAT-3)**

Wide Range Achievement Test-3 (WRAT-3) was developed by Wilkinson (1993). It is a test that screens out basic skills in Reading, (i.e., decoding sounds, making sound/symbol relationships and sight recognition) Spelling, (i.e., discrimination, generalization and the ability to integrate information from auditory sub-modalities) and Arithmetic. It takes approximately 30 minutes to be administered. The norms are well developed on wide range of population. Age also ranges from 5 to 75 years of age. The Reading test is administered individually while the other two can be done in group. Test-retest reliability is in high ranging from 0.91 to 0.98 on the nine tests of the WRAT 3 with best content and constructs validity [12].

Norms of WRAT- 3 was already established on Pakistani population by Ahmad, Riaz and Khanum. The coefficients for all test ranging from, 0.724 to 0.932. For the whole sample the values for Spelling, Arithmetic and Reading are 0.889, 0.906 and 0.927 respectively [13].

## **2.3 Procedure**

At the first stage of study permission was taken from the authors of different tests that were to be used in the study. Initially, Informed consent was taken from the school administration and then Data was collected from students independently. The participants were briefed about the purpose of the study for establishment of rapport. All participants were scattered by seating them randomly in order to control the corresponding and cheating factors. In order to ensure their willingness of voluntary participation in the study written consent was taken from them. They were asked to complete the demographic forms, after which the spelling subtest of WRAT-3 [12] and BRIEF [10] were administered on them in a group. However, the other two subtests i.e. arithmetic and reading were administered on each participant separately. The procedure for administration of all three subtests was followed according to the instructions given in the manual. After completion of the data collection, the

co-operation on part of school's administration was appreciated by the researcher before leaving. Scoring was done by following the procedure given in the manual. To interpret the results through statistical analysis, Pearson Product Moment Coefficient of correlation was calculated through SPSS version 12.0.

### **3. RESULTS**

The present study is an attempt to investigate the role of Behavior Rating Inventory of executive functions in academic achievement of students. For this purpose following hypothesis was formulated: the scores on Behavior Rating Inventory of executive functions will be positively correlated with the scores on academic achievement test (i.e. reading, spelling and arithmetic) in high school student.

Through Statistical analysis it has been revealed that all three components of academic achievement did not show statistically significant positive correlation with Behavior Rating Inventory of executive functions of high school students. Results show that Mean score of Reading is 37.02 with standard deviation of 6.04 and PPMCC is .010 with significance level of .924 ( $p > .05$ ). This result indicated non-significant relationship between Behavior Rating Inventory of executive functions and Reading component of academic achievement. Further, mean score of spelling subtest is 31.1 with standard deviation of 4.62. The PPMCC of spelling subtest is -0.24 with significant level of .813 ( $p > .5$ ). This again indicated that there is no correlation between age adequate spelling achievement and Behavior Rating Inventory of executive functions. Lastly the Arithmetic Mean score is 32.43 with standard deviation of 3.16. The PPMCC is -.15 with a significance level of .135 which is also statistically insignificant ( $P > .05$ ). These results indicated that academic achievement does not correlate with the Behavior Rating Inventory of executive functions of student ( $p > .05$ ).

Additional findings from statistical analysis of BRIEF subtests showed that there is insignificant relationship between Meta-cognition Index and academic achievement ( $P > .05$ ), as the mean score of Reading is 37.02 with standard deviation of 6.04 and PPMCC is .035 with significant level of .726 and mean score of Spelling component is 31.1 with standard deviation of 4.623. The PPMCC of spelling subtest is -0.17 with .864 significant levels ( $P > .05$ ). Lastly the Arithmetic Mean score is 32.43 with standard deviation of 3.16. The PPMCC is -.114 with significance level of .257 ( $P > .05$ ).

Further analysis revealed that there is significance relationship between behavior regulation Index and Arithmetic subtest ( $p < .05$ ). However, there is insignificant relationship between the other two components i.e. Spelling and Reading. As the Arithmetic Mean score is 32.43 with standard deviation of 3.16. The PPMCC is -.227 with a significance level of .023. ( $P < .05$ ) While the Mean score of Reading on Behavior regulation is 37.02 with standard deviation of 6.04 and PPMCC is -.044 with significance level of .667 and mean score of Spelling is 31.1 and standard deviation are 4.623. The PPMCC of spelling subtest is -.061 with significance level of .549 ( $P > .05$ ).

**Table 1. Descriptive Statistics of Demographic Information's of entire sample**

<b>Variables</b>	<b>N</b>	<b>%</b>
<b>1) Gender</b>		
Male	50	50%
Female	50	50%
Total	100	100%
<b>2) Education</b>		
6 <sup>th</sup> grade	04	04%
7 <sup>th</sup> grade	44	44%
8 <sup>th</sup> grade	52	52%
Total	100	100%
<b>3) Family structure</b>		
Nuclear	72	72%
Joint	28	28%
Total	100	100%
<b>4) Tuitions taken</b>	40	40%
<b>Tuitions not taken</b>	60	60%
Total	100	100%
<b>5) Birth order</b>		
1 <sup>st</sup> born	39	39%
Middle born	16	16%
Last born	45	45%
Total	100	100%
<b>5) Age</b>	<b>M</b>	<b>N</b>
Male age	12.640	.94
Female age	12.360	.89
Both	12.500	.92

Most of the adolescent are studying in 8<sup>th</sup> grade (52%) and didn't take tuition (60%). Mostly are last born (45%) and living in a nuclear family system (72%).

**Table 2. Mean scores, Standard deviation and Pearson product moment Coefficient of correlation between behavior rating Inventory of Executive functions and Level of Academic Achievement in high school children**

<b>Variables</b>	<b>N</b>	<b>M</b>	<b>SD</b>	<b>r</b>	<b>Sig</b>
Executive Functioning	100		21.42		
1)Reading	100	37.02	6.040	.010	.924
2)Spelling	100	31.17	4.623	-0.24	.813
3) Arithmetic	100	32.43	3.163	-.151	.135

Note:  $p > .05$

There is no significant relationship between the variables of academic achievement and Behavior Rating Inventory of executive functions.

**Table 3. Mean scores, Standard deviation and Pearson product moment Coefficient of correlation between Meta-cognition Index and Level of Academic Achievement in high school children**

Variables	N	M	SD	r	Sig
Meta-cognition	100	71.10	13.89		
1)Reading	100	37.02	6.040	.035	.726
2)Spelling	100	31.17	4.623	-.017	.864
3) Arithmetic	100	32.43	3.163	-.114	.257

Note: ( $p > .05$ )

There is no significant relationship between the variables of academic achievement and Meta-cognition.

**Table 4. Mean scores, Standard deviation and Pearson product moment Coefficient of correlation between Behavior Regulation Index and Level of Academic Achievement in high school children**

Variables	N	M	SD	r	Sig
Behavior Regulation	100	51.07	8.192		
1)Reading	100	37.02	6.040	-.044	.667
2)Spelling	100	31.17	4.623	-.061	.549
3) Arithmetic	100	32.43	3.163	-.227	.023

Note:  $p < .05$

There is significant relationship between the Arithmetic, variable of academic achievement and Behavior Regulation.

#### 4. DISCUSSION

Findings from the present research showed that Behavior Rating Inventory of executive functions and academic achievement of high school students does not correlate with each other. All the component of achievement i.e. Reading, Spelling and Arithmetic are independent of Behavior Rating Inventory of executive functions among high school students in Karachi-Pakistan. (Table: 2) In Table: 3 additional findings showed that all three components of academic achievement that is Reading, Spelling and Arithmetic show no relationship with the Meta-cognition (sub component of behavior rating inventory of executive functions) of student. While in the Table: 4 significance relationship was found between Behavior regulation (sub component of behavior rating inventory of executive functions) and Arithmetic.

In Pakistan the concept of executive functions (i.e. process related to consolidating, selecting, concentrating, withstand and shifting attention to activities, control vigilance, managing speed and obstruction, ability to regulate emotional state, working on recollection, and monitoring actions) is not known by the parents and teachers who are responsible for providing opportunities for better learning. It was also noted during our data collection that school teachers as well as student didn't have any idea about the role of executive functions. Our research findings also supported by the findings of Said research revealed that executive functions didn't predict academic performance [8]. Likewise Best and Miller stated that till now it is ambiguous whether academic achievement on the whole correlated with



executive functions or there is a certain specific skills related to academic that are linked [14].

In this context previously Altemeier, Jones, Abbott, and Berninger already pointed out that, there are two doubts persisting. Firstly, all the preceding on executive functions is unreliable that either the executive functions are domain general and obligatory in academic abilities or domain specific and uncorrelated to academic skills. Secondly, there are certain indications about the close relationship of early scholastic achievement with Executive Function whereas there is a lack of researches assessing this relationship across all grade levels. Therefore, an exploration of the relationship, both reading and math with executive functioning is needed in a descriptive sample of all ages [15].

Considering these previous finding it was deemed important to investigate the role of specific components of behavior rating inventory of executive functions with academic achievement of students. The researcher such as Klenberg, Korkman and Lahti-Nuutila explained that even though these cognitive skills are interconnected, the direction and timing of their progression is very much different from each other. Interestingly the growth of the inhibition in children that can be said as an elementary function is separate from other executive functions, and likewise the different skills comprising executive functions carry on to progress in the teenage years [16].

As our research findings also showed that there is also a significant association between arithmetic and behavior regulation index (i.e. inhibit, shift and emotional control) in the student of 12 to 14 years old. On the students of similar age ( i.e. 11 and 12 year) Klenberg showed that the skills by which one can apprise their recollections were not associated with the skill of inhibition( component of executive function) [16]. Moreover, a study by Lehto, Juujärvi, Kooistra and Pulkkinen also illustrated certain indication that in children there are distinct executive functions even though the different studies varied extensively in the quantity and quality of these cognitive tasks [17].

In 2011 Best, Miller and Naglieri in their article mentioned that although there seems to be certain uniformity in the collected works concerning executive function in and scholastic achievement nevertheless, the associations among definite characteristics of executive function and success in schools are indistinct. Further they reported that disrupting the functioning of dorsolateral prefrontal cortex impairs performance when a task is familiar; presumably, thinking about what you are doing would get in the way of efficient performance. [18]. Similarly Senn, Espy and Kaufmann revealed that in the establishment of executive function there may possibly be a variance in the advancement of these skills [19].

Likewise McClintock in his dissertation mentioned that if during development of executive functions no special attention is given to its different aspects there is always a chance that it won't develop. That is one of the reasons of our generations draw fall and even they themselves are living in the darker side of their qualities. It seems that for the development of executive functions central infantile is a risky age. Perhaps, if the ability of inhibition cannot be advanced or progressed in the middle of six to eight years, will influence other abilities far along and cognitive progress may not mature. Further it is noted that executive functioning is not always needed when an action is complex and involves an intricate sequence [20].

In 2011 few research findings indicated the role of supervision and quality of teaching as important factor in the progression of executive functioning of students. For instance

Bozeday mentioned that throughout the school ages advancement of executive functions specifically in relation to academic tasks, be determined by the quality of the teachings given to students [21]. According to Banich there are numerous instruments currently available that quantify a variety of aspects of executive functioning. However, the nature of executive function makes it difficult to assess, because it includes an activity that involves judgments of a person to supervise his or her behavior in new, incipient, unplanned, and un-monotonous circumstances [22].

Behavioral regulation is a broader concept of self-regulation. It may be described as the ability of an individual to use his or her cognitive abilities into behavior for instance memorizing, regulating inhibition and attentiveness. It comprises concentrating, sustaining attention and constraining movements that are unsuitable to one's circumstances. Every single child's behavioral regulation is determined exclusively by consuming chances to run through these skills. Correspondingly in school settings children have to decide the significance factors to concentrate on, filter the unrelated information and to govern spontaneous response or inhibit the inclination to be confused by insignificant stimuli (NICHD ECCRN) [23].

McClelland et al. [24] done a controlled research on 310 children that determined that the behavioral regulation significantly and positively predicted fall and spring emergent literacy, vocabulary, and math skills when the mode of instructed was the opposite of verbal, that showed if the pattern of teaching or delivery instruction is changed; students learn better. Further in 2009 researches points out that the behavioral regulation predicted children's reading, math and vocabulary in kindergarten level and specially gains made over the school year in math achievement but not interpersonal skills. (Ponitz, McClelland, Matthews, & Morrison) [25]. Interestingly Naglieri and Johnson [26] also found that increases in academic performance has been found when children have been taught to better utilize executive functions strategies when doing math computation. When I conclude the findings of above mentioned researches its evident that executive functions are progressive in nature and if rich teaching and learning environment is being provided to students in early childhood there are more changes of improvement in specific academic performance.

While studying on Pakistani sample Hashmi, mentioned that the central aim of education is to produce the most productive individuals for the society. In these days, academic training is regarded as means to bring about positive modifications. But in Pakistan its importance is totally being ignored and as a matter of fact despite having knowledge of this situation no effort is being done in this regard to improve the current practices. We have entered into 21<sup>st</sup> century but our academic system is constantly getting worse. It needs total rebuilding to be replaced by a new system which is latest, concise and practical. There is a consensus of opinion that individuals possess varying degrees of capabilities like thinking, hearing and comprehending but the real need is to direct an individual towards a correct track to act efficiently at a suitable time. Further he wrote in his dissertation that Pakistani educational system suffers from many deficiencies. It is producing low quality incompetent individuals who not only lack creative skills but are inefficient which in turn results in low productive individuals thereby wasting lot of public money. People hold responsible the present system of education and demand a change. To survive and flourish in the current global highly competitive environment there is need to change current syllabus, learning and training strategies and assessment methods of students in order to enhance their intellectual and creative capacities. The system should not help to identify an individual's own abilities but also not able to correctly evaluate his potential. In today's world, a number of new fields offer new occupations which demand persons who have specific expertise in abstract thinking

and problem solving which is directly related to executive functioning. Non availability of evaluation methods to assess advanced level of intellectual abilities also hampers mentor's capacity to guide the deserving students to enter into such professions [27].

In summary, the administrators responsible for academic institutions must make an effort to develop mechanisms to assess the students' capabilities in rote knowledge and advanced executive functions. This will surely identify the children who have deficiencies or have powerful traits in executive functions and therefore can be channeled into academic regimens and profession routes best suited to them.

## **5. CONCLUSION**

Over all in the light of this study we can conclude that Behavior Rating Inventory of executive functions and academic achievement in high school students is not correlated with each other. There is no relationship in these two elements. It's very clear that executive functioning is a skill that needs to be polished for its implication. While discussing results it is lucidly mentioned that if executive skills remains unrefined they in future show no benefit to an individual. These skills need proper attention a throughout the school years. The more student focus on them the more they get advantage. In our developing country students still face personal and environmental problems that affect their academic results. There is a strong need to instruct and train them to sharpen their every executive skill and then any relationship can be explored further.

## **ACKNOWLEDGEMENTS**

The work presented in this research was accomplished by the generous and supporting attitude of schools authorities from whom the data was collected. I would like to acknowledge Director Institute of Clinical Psychology, University of Karachi Dr. Riaz Ahmad, my Supervisor Dr. Uzma Ali who provided guidance and opportunity to conduct this study as part of my PhD Dissertation.

I also want to thanks my family for their financial and emotional support. Without them it was impossible to complete my work.

## **COMPETING INTERESTS**

Authors have declared that no competing interests exist.

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