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Executive Functions and their Relationship to the Difficulty of Feeling the Quantity of Primary School Students

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Abstract: The present research aims to reveal the relationship between the executive functions and the difficulty of feeling quantity in the students of the primary stage. The research problem was determined in the following two main questions: is there a relationship between the executive functions and the difficulty of sense of quantity for elementary students. What percentage of the contribution of executive functions in predicting the difficulty of sense of quantity in primary school students. The current research sample consisted of (389) male and female students which constitute (2.7%) of the research community with (204) students (52.5%) and 185 students (47.5%). Some of the necessary measures have been taken including the adoption of the executive functions scale prepared by Peter K. Isquith, PhD & Gerard A. Gioia, PhD and PAR Staff, 2000, after the translation of the original version. In order to prepare the test paragraphs of the sense of quantity, the following steps have been followed: the literature and the previous studies were reviewed in the Arab and Foreign countries through which the researcher drew her ideas in the preparation of the test items which include some activities and tasks that can measure some of the mental aspects related to the variable under study (sense of quantity) in the students of the third grade primary. For the purpose of adopting the best method of measurement has been taking the views of professors specialized in psychological measurement and educational psychology as they agreed to adopt the forms as the most appropriate and the most accurate and in accordance with the theoretical concept adopted in the research (40) one of the forms that measure the sense of quantity was selected from multiple scales. One of them was chosen as an example of clarification. The research reached a number of results including: there is a clear correlation between the deficiencies in the performance of executive functions and the difficulty of sense of quantity among students in the third grade primary. All areas of executive functions contribute to predict the sense of quantity and there is a difference between these areas in terms of strength of contribution. In the light of these findings, the study summarized a number of conclusions, recommendations and proposals.

Key words: Functions, contribute, performance, quantity, recommendations, proposals

INTRODUCTION

Research problem: Since, the sense of quantity is a mental ability related to numerical processing and the acquisition and understanding of the basic mathematical facts and concepts of children in mathematics, the problem of the current study is justified in the statement of the factors responsible for this capacity and from the main role indicated by many theoretical frameworks and previous studies of importance. The role of executive functions in learning in general and in academic achievement in mathematics in particular.

Based on this crucial role of executive functions in the learning process, many researchers (Clements *et al*., 2016) emphasized the importance of studying the rate and mechanism of job development. In the early years of the child's education in order to avoid the problems and difficulties of academic learning resulting from its limitations and to provide the necessary strategies for development at this age (Salimpoor and Desrocher, 2006; Anderson and Reidy, 2012; Clements *et al*., 2016; Cantin *et al*., 2016).

Emerson and Babtie (2014) in his talk of dyscalculia, finds that the difficulty of sense of quantity is one of the main indicators of calculation difficulties which reflect a weak sense of number such as inability to quantify quantities, child's ability to handle numbers in a way that reflects the development of his ability and sense of number includes the child's understanding that the number represents the amount of what is (Cardinal aspect)

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and that these numbers can be compared in terms of quantity (the so-called Ordinal order) (Emerson and Babtie, 2014).

Lindsay *et al.* (1999) emphasized that the importance of executive functions in learning is to bridge the gap between knowledge and doing organize outputs over a long period of time, combine learning and memory processes together and then organize them as processes coding, encryption integration, storage and retrieval, emphasizing that working memory and the cessation of non-task-related automatic responses are the two main components of the operational function. Therefore, the lack of operational functions in particular the poor functioning memory, contributes to poor procedural skills, delayed growth of facts and basic mathematical representations adversely affect a many neurodegenerative processes are characterized by a decline in long-term memory capacity, selective attention to stimuli, activation level associated with the coding of mathematical problems and slow pace of computations (Lindsay *et al.*, 1999).

On the other hand, the researcher has noticed by virtue of the nature of her work as a faculty member and researcher in the field of educational psychology and on the complaint of many teachers and parents, the difficulty of the ability of some children in the primary stage to recognize some basic facts and concepts in mathematics and the differentiation between the different numerical quantities as well as confusion in the recognition of numerical units or identify the corresponding numbers of the numerical quantities represented which are all essential components in solving the various mathematical problems which in turn leads to the failure of the student in performance in the study Alraya These students, however, do not suffer from any specific disabilities as well as they are advanced in the academic achievement in other subjects and are distinguished in participating in the various school activities which raised the researcher's thought and interest in order to identify the causes of this phenomenon and the study. Through the answer to the question posed by the current study. Is there a relationship between the executive functions sense of quantity for elementary students.

Research importance: The executive functions are among the most prominent variables of cognitive psychology which have attracted the attention of many educational researchers in Foreign countries recently. This is because of its prominent importance in the management and direction of children's behavior in different life situations, especially, in educational situations where many researchers consider executive functions as knowledge or as many researchers call it the "meta-cognitive" process. It is the maestro who organizes, manages and controls the performance of key cognitive processes such as attention, memory and cognition which are essential elements of performance. Academy for children in learning and their role is limited to a particular age group stage but highlights the importance for the individual throughout all ages. On the other hand, the lack of executive functions leads to many psychological and behavioral problems.

Many researchers Meltzer and Krishnan (2007), McCloskey *et al.* (2009), Cragg and Gilmore (2014) and Zhang (2016) have emphasized the importance of executive functions in the process of child learning and the interpretation of individual differences among learners in scholastic achievement Leads to learning difficulties in different areas of study. Meltzer and Krishnan (2007), McCloskey *et al.* (2009), Cragg and Gilmore (2014) and Zhang (2016).

Zhang emphasized that executive functions are important and essential for learning in many areas. There are several evidence of the relationship between executive functions and academic outputs, especially, mathematics. They play an important and vital role in the early learning of the number of children. The results of recent studies have shown that executive functions are a strong indicator of digital competence and computational efficiency in young children (Zhang, 2016).

Ness (2005) shows that the results of studies in the field of mathematical development indicate that quantitative awareness begins from the early days of childbirth where the infant is able to recognize the separate numerical quantities as well as the differentiation between the different groups on the basis of size, number.

Huber *et al.* (2015) points out that deficient number representation is one of the basic deficiencies of children with developmental dyscalculia. The lack of quantitative treatment of number (number of magnitude) is due to two assumptions: a deficit) assigned to the quantitative system; lack of access to (get) the quantitative representation through the symbolic numbers (Huber *et al.*, 2015).

The results of the study Szucs *et al.* (2007) also show that physical quantities are more prominent for small children than numerical magnitude, so, the physical size is processed faster and mechanically. The expectation was that the overlap was more robust in young children because of their relative inability to prevent (inactivate) irrelevant information compared to older children (Szucs *et al.*, 2007).

From this we find that the mental treatment of quantity (sense of quantity) is the basic pillar around

which the difficulties of mathematics surround and without it is difficult, if not impossible the child to solve the problems in all areas of secondary mathematics in other words, quantitative and this is what the researcher called to focus on this variable and addressed in the current study as the core of mathematics, especially, that within the science of the researcher was not addressed by one of the researchers.

Based on the above, the researcher summarizes the most important reasons for her study; executive functions play a critical role in the learning process, especially in early school years. Shortage of executive jobs results in difficulties in the learning process and low academic performance in various subjects, especially, mathematics. Mathematical competence related to the mental processing of numbers depends on the efficiency of the executive functions of children. There are no Arab studies within the limits of the researcher's knowledge sought to study the relationship of executive functions with a sense of quantity as one of the primary features and abilities in the acquisition of athletic competence for primary school students.

MATERIALS AND METHODS

Objectives of the study
Current research aims to identify:

- The level of executive functions of third grade students
- Statistical significance differences in the level of executive jobs among third grade students by sex variable
- The level of sense of quantity among students in the third grade primary
- Significant statistical differences in the level of sense of quantity among students in the third grade by sex variable
- Identify students with difficulty in sense of quantity

The correlation between executive functions and the difficulty of sense of quantity and the extent of the contribution of executive functions in the difficulty of feeling the quantity of students in the third grade primary.

The limits of the study: The current research is determined by students of the third grade of primary (both sexes) in the schools of the center of Babil Province for the academic year 2017-2018.

Terminology
Executive functions/defined by: Pennington and Ozonoff (1996) have the ability to maintain several appropriate solutions to a problem related to the achievement of a future objective which includes one or more of the following; an intention to respond or to delay the most appropriate time, the mental representation of the task and the coding of information relevant to the task in memory and the desire to achieve a future goal (Pennington and Ozonoff, 1996).

Cragg and Gilmore (2014) is a name for the set of processes that allows us to respond flexibly to our environment and to deliberately engage in goal-orientation, thinking and action. They form the basis of problem-solving and flexible thinking in new situations where there is no external orientation (Cragg and Gilmore, 2014).

Theoretical knowledge (as a system of knowledge processing and behavior programming and coordination of the performance of cognitive processes in a way that allows flexible response and is the basis in the identification of goals and work to achieve through coordination between thought and research, especially, in new situations).

Procedural definition (the total grade obtained by the student/pupil and estimated by the teacher/teacher according to the paragraphs included in the executive function measure to be prepared in the current study).

Sense of quantity: Defined by both the child's ability to match the quantity with the number corresponding to the number of quantitative correspondence which is one of the main abilities in semantic processes and the ability to understand the meaning of numbers as measurable mental representation and matching between quantity and number.

APA (2015), the ability to solve various quantitative issues such as mathematical mathematical questions, mathematical questions and numerical concepts issues which consist of several distinct skills.

The researcher defined the quantitative sense of procedure as "the total degree attained by the student/student, through his answer to the paragraphs of the test sense of quantity to be prepared in the current study".

Theoretical framework and previous studies
The concept of executive functions
Historical profile of the concept of executive functions: Although, the term executive functions first appeared in 1997, the concept of the control mechanism was discussed in the 1840s and in the 1950s, psychologists and neurologists became more interested in understanding the role of frontal cortex in behavior In the case of the Phineas case study which resulted in an incident that caused the frontal lobe and resulted in

changes in behavior and personality, the researchers then investigated the role of the frontal lobe and the concept of executive function.

At the time, British psychologist Donald Broadbent described the differences between automatic processes and seizures. Based on this distinction, Schifrin and Schneider presented a detailed view of selective attention that is closely related to executive functions.

In 1975, psychologist Michael Posner formulated the term cognitive control in a book entitled attention and cognitive control. It was assumed that an independent executive branch of the attention system was responsible for focusing attention on selected aspects of the environment . Alan Baddely proposed a similar system as part of his working memory model called central executive which allows information to be processed in short-term memory. Pribram is one of the first to use the term "executive" when discussing issues related to the function of the frontal cortex and since, then more than 30 components have been listed under the term executive functions. Many researchers have made attempts to define the concept of operational function using models ranging from one component to several components.

In 1995, Lezak suggested that executive functions consist of components related to volition, planning, purposeful work and effective performance, each with its own set of behaviors. In 2006, Reynolds and Horton suggested that executive functions differ from general knowledge. The former refers to the ability to plan to do specific things to implement adaptive actions (adaptive behaviors) while the second is to maintain an organized set of objective facts. It also assumes that executive functions include decision-making, planning procedures and generation of new mechanical responses to adapt to environmental requirements rather than passive information retention.

It may be said that although, the term executive functions has been of interest to many researchers in recent times, it has historical roots dating back to the mid-nineteenth century. The beginning of this study was the result of the study of brain injury cases and the extent of damage or imbalance In the frontal lobe of the brain on personal behavior in addition to that the executive functions reflect the active handling of information received in order to adapt to environmental variables.

Explained models of executive functions: Several different models of executive functions have emerged. The multiplicity of these models reflects the divergence of the researcher's views on the concept, the nature of the work mechanism and the components of executive functions. The following is a summary of five of these models.

First barkley model barkley: Barkley presented a model of executive functions in which he explained that behavior control depends on behavioral behavioral inhibition in gradually shifting the position of adjustment from external factors to control by internal mental representations of the task, behavioral functioning is linked to the mechanism of action of four other executive functions (working memory, speech comprehension, self-regulation of feeling/motivation/excitement, behavior restructuring) which represent the neuropsychological functions of the frontal fascia and its task is to regulate and regulate the self in a manner that directs behavior towards the goal. These components combine to determine the final form of response (automatic tuning/fluency/synthesis). The following is an explanation of the components and mechanism of this model:

- Behavioral coercion behavioral inhibition
- Working memory working memory
- Speech comprehension internalization of speech
- Self-regulation of affect-motivation-arousal
- Restructuring behavior reconstitution
- Automatic control/fluency/synthesis motor control/ fluency/syntax

Third; the Miyak *et al*: In his empirical study, Miyake *et al.* (2000) concluded that the frontal frontal cortex has three executive functions that are active in the performance of complex cognitive tasks and are responsible for the executive control of behavior. This is the main source of human knowledge dynamics. These functions are shift between tasks or mental groups (shift shift): update and monitor working memory representations (update updating): stop automatic responses (inhibition).

This means that the executive functions-according to this model-consist of three main functions; the first reflects the ability to shift attention flexibly between the different elements of the position; the second is the working memory that encrypts and processes the most relevant information while ignoring the information that is far from the task, the third function is the ability to prevent the spontaneous response that hinders the effectiveness of the orientation towards the goal and thus these three functions are integrated in the greater control of the performance and behavior of the individual in different situations (Miyake *et al.*, 2000).

Second: McCloskey *et al.* (2009) believes that the mechanism of executive functions is carried out, according to a hierarchical system that reflects the development and interaction of the neuropsychological

functions of the frontal cortex. However, these functions are relatively distinct and independent. Their evolution from the bottom up is five levels self-control and self-integration. Each level has a number of sub-operational capabilities to achieve. This can be illustrated as follows:

- Level 1 self-activation self-activation
- Level 1 self-regulation self-regulation

The third level: the highest level of self-control which consists of two mechanisms of work, each achieved by two sub-capacities as follows.

Self-realization: The cognitive processes responsible for achieving self-awareness and self-analysis by taking advantage of previous experiences by applying them in the target position to modify behavior, according to the requirements of the situation.

Self-determination: Refers to the ability to plan long-term and to create long-term visions that can be applied over a long period of time including the use of past reflection to improve and develop behavior and thinking in the future by awareness of self-nature and generation of future goals.

- Level 4 self-generation
- Level 5 self-integration trans-selfi integration

Accordingly, the executive functions are carried out, according to a hierarchical system of five levels each with a set of sub-capacities that achieve it and the direction of development of the executive functions is from the bottom up; the first three levels are aimed at self-control while the other two levels represent the higher level of executive functions; level I is its function self-motivation to deal with the requirements of the situation by moving the individual from the state of unconsciousness to the state of consciousness, the second level is the basis of executive functions and its function to regulate and guide the performance of the individual from various cognitive, emotional and behavioral aspects through (23) the third level, the highest level of self-control, consists of two components: self-achievement and self-determination while the fourth and fifth levels reach the optimum level of executive functions (McCloskey *et al*., 2009).

Sense of quantity: Genovese *et al*. (2005) finds that the ability to "quantify" as a two-digit comparison or order of a set of numbers is one of the main manifestations of mathematical ability. This ability does not follow general cognitive competence but is a component of the complex cognitive system such as quantity, numbers, procedures and strategies (Genovese *et al*., 2005). Relationship between sense of quantity and sense of number.

Krajewski and Schneider explained that during the language acquisition phase, a child learns a large number of non-numerical terms related to quantities, called protoquantitative terms such as large/small, many/few where he is able to compare two quantities given that One gives the result verbally greater than or more than and at an advanced stage is able to compare asynchronous quantities (not present at the same time) and gives a judgment in terms of whether the quantity has increased, decreased or remained as it is and the realization that quantities can be analyzed into parts and reassembled. These form the basis for understanding several key principles of the number system.

Wagner and Davis in a study entitled "sense of number" is a key requirement for quantity sense. It emphasizes the importance of developing the sense of quantity in school math for children. Quantitative sense of quantity related to cultural issues related to it including verbal and symbolic representations of number or number; identification of some instructional strategies to develop sense of quantity coupled with sense of number, sense of number depends on the sense of quantity.

Wagner and Davis, a major requirement for learning mathematical concepts was identified by the National Council of Mathematics Teachers (NCTM) in 1987 indicating that a child who has a good sense of number (1 and 2) recognizes the evolution of multiple relationships between numbers (3) realizes the relative quantity of numbers (4) defines the relative effect of operations on numbers. Wagner and Davis point to a confusion between the terms sense sense and number of sense.

Wagner and Davis emphasized the importance of distinguishing between the concept of quantity and the concept of counting (using numbers). Some studies investigated children's ability to check the number of things within a group (100). It was found that children use many psychological strategies, most of them a combination of count and sense of quantity without counting them.

Wagner and Davis emphasize the importance of distinguishing between the concept of quantity and the concept of number and feel that the sense of number can develop independently of the sense of quantity. Some people have the ability to distinguish between different quantities despite their limited ability to process numbers the number).

Gersten *et al*. (2005) finds that the characteristics of a good sense of number include; fluency in quantification and judgment, ability to recognize irrational results, flexibility in computational calculations). The ability to move between different mental representations and the use of the most appropriate representations (Gersten *et al*., 2005).

He added that the number does not evoke (calls) only sense of quantity but also devotes a sense of space. Where there is a strong link between numbers and emptiness.

Executive functions and their relation to numerical sense: Bull and Lee (2014) emphasized that both modernization and automatic response are mathematical learning outcomes that "modernization" is the most important predictor of the child's early quantitative quantitative skills and that executive functions foretell the early mathematical skills of the child. The "update" is a precise predictor of the calculations while both the update and the response stop predict counting skills (counting skills) (Bull and Lee, 2014).

Szucs *et al*. (2007) notes that the Numerical Stroop Paradigm (NSP) Model which was presented as part of a study aimed at studying the interaction between quantitative and executive treatment of children at the beginning of primary school (1-3) (In parallel) where it depends on the organization of responses and the extent of irrelevant information, makes this model excellent in interpreting whether the separation of developmental paths of executive versus numerological functions plays an important role in numerical growth, demonstrates cognitive features and overlap.

Bull and Lee (2014) argues that shifting helps to switch between processes and solution strategies, the extent of the "scope, limits" of quantities and the taking of observations (e.g., the shift between verbal and written Arabic symbols, non-symbolic quantitative representations and steps of complex multi-step issues.

The results of the Rubinstein and Henik study, based on neuroimaging of the brain during response to tasks requiring comparison of two numbers, showed that a specific part of the parietal brain region is responsible for the "cognitive" mental representation of the numerical quantity such as the basic numerical knowledge as the core numerical system is the basis for the evolution of growth.

"The ability of mathematical sports, pointing out that the individuals who have deficiencies in this type of treatment due to the presence of deficiency (defect, deficit) in the nerve tissue that support this system (the main numerical processing system) and the researchers concluded that the distance between the two numbers they have an impact on the speed of response in children during performance on two-number comparison tasks; they respond faster when numerical numbers are more distant (such as 3-8 than when they are closer than 4-6) Between the reaction time and the numerical distance is called the Distance Effect (DE) by Karagosky and Schneider Model of Quantum Sensitivity.

Krajewski and Schneider presented a model describing the development of the sense of quantity for children. It was assumed that the quantitative efficiency associated with the child's early quantity-number competencies is acquired by three levels that lead the child to a deeper understanding of quantity correlations with the number; at the second level, the ability to link the number word to the quantity represented by it grows. The main assumption on which this model is based is that quantitative efficiency levels describe the transition or shift from procedural action by counting to a growing conceptual understanding of the meaning of number words, noting that these levels work simultaneously for words of numbers and numbers, between (verbal style of verbal word) and (visual form of number). It is also assumed that the child may reach the third level of proficiency for small numbers while still working at the second level of large numbers. Children, for example, at the age of 3 years can distinguish between numbers in up to 4 numbers (second level) of them at the age of 3 years-usually 5 years can distinguish numbers 5-9, so that, the child has at the same time different levels of development of the efficiency of the sequence of number words. In addition, the number of words assigned to the raw quantity classifications (level 3) is not constant which means that the numbers (e.g., 20) can be set (for example: many) and later puts them in a different format (e.g., a few) which makes it very difficult to evaluate this development stage accurately. It should be noted that any of the three levels of efficiency requires certain mental processes such as visualization and that higher levels can be transferred by concrete materials. Early transformation from physical (gain of efficiency by concrete material) to mental representation is essential to achieving higher levels of quantitative efficiency.

This transformation can be seen as a change in representative representations of competencies (acquired from tangible materials) to represent numerical processes (e.g., number analysis, level 3) and can also be seen as numerical equations. The concept of numerical relations at level 3 reflects the competencies that actually represent arithmetic and thus, the correct mathematical understanding. In contrast, the first and second levels

(basic numerological skills and quantity-word correlation) represent competencies that can be viewed as real mathematical skills. The following three levels are explained below:

- Level 1: Basic numerical skills
- Level 2: Link number words with quantity linking number words with quantity
- Level 3: Link quantity relationships with number words linking quantity relationships with number words

Second; previous studies: The researcher presented previous studies that examined the relationship between the executive functions and the mental processing of the numbers on the basis that numerical treatment is the source or main factor of the quantitative sense variable in the current study. The following is a summary of these studies.

Strucks *et al.* the aim of this study was to investigate the effect of non-mature functional functions on children on numerical functions in the Strobe Model which is widely used as a measure of NSP to develop The study sample consisted of three groups the first 16 children in the third grade of primary school, 2 were excluded, the average age was 9.47 years and the standard deviation was 0.37. Second; 16 children of the fifth grade of primary school age (11.55 years) and standard deviation (0.43); third: 16 young children, average age (21.43 years) and standard deviation (2.44) years in Hungary. Using a range of different tasks for operational functions and quantitative processing tasks, the model is based on the Stereop Paradigm (NSP) Model which is used to assess the automatic number processing capabilities in children; the examinee is asked to determine whether the number is greater in numerical or physical terms than another number is displayed at the same time. The results of the study yielded the following results: there was a significant effect of non-maturation of executive functions on numerical processing tasks and the factor of non-related responses was the main factor behind intervention in numerical tasks in children. Children on the NSP model, frontal operational settings play an important role.

Andersson and Ostergren (2012) study (Quantitative processing of the number and key cognitive functions of children with learning difficulties in Mathematics), aimed at examining the relationship between the number of quantitative learning and the main operational cognitive functions in children with learning disabilities in the preparatory stage. Hypothesis for the same sample of children. Various aspects of cognitive functions and quantitative processing of numbers were assessed in a sample of 63 students, ranging in age from 11-13 years and with difficulties in learning mathematics, compared to another sample of the ordinary of the same age and using a different set of metrics based on the performance of tasks to measure the processing quantity Kalmgarnh between a pair or a couple of numerical quantities or which are based on a distinction between different numerical quantities or optical scanning amounts of numerical and other tasks. The results of the study showed that the group of students with learning difficulties showed weakness with most aspects of number processing (Symbolic number comparison, number-line estimation, subitizing) as well as statistically significant deficits in spatial visual memory. Which indicates the lack of numerical processing system as well as a defect in the Object Tracking System (OTS) in children with learning difficulties in mathematics as well as a general knowledge deficit and difficulty in the process of coding numbers indicating that the difficulties of learning mathematics due to several reasons are not a single and fundamental reason.

Research methodology and procedures: This study includes a description of the research methodology and procedures followed by the researcher in dealing with the subject of the research, namely the description of the society and the selection of the sample and the procedures followed to achieve the basic requirements that were based on the adoption of the measure of executive functions and build the test sense of quantity and extraction of the appropriate psychometric properties of the three research tools as well as the appropriate statistical means used in data analysis .

First; research society: The society consists of all the characteristics of the phenomenon studied by the researcher and includes all the individuals and people who are the problem of research. The current research community is determined by the third grade students in the schools of the center of Babil Governorate (public schools) for the academic year (2017-2018) of (14193) (4749%). The table shows the total research community disaggregated by sex.

Second; sample research: The sample refers to a group of individuals representing a part of society where they are withdrawn from the original society according to an appropriate scientific methodology. The researcher used the sample to determine the size of the sample, according to which the sample size was (389) male and female students which constitute (2.7%) of the

research society, 204 students, 52.5%, 185 students, 47.5%). The table shows the sample of the research by sex.

Third; research tools: To achieve the objectives of the current research and to study the relationship between the two variables are executive functions and sense of quantity and after reviewing the literature and previous studies related to the variables of research has used the researcher tools that conform to the objectives of the study and included.

The executive function scale, quantitative sense test (prepared by the researcher) below is a description of the theoretical concepts, concepts and components of the executive function standard and to test the sense of quantity and the procedures for preparing them theoretical premises.

Executive function scale: The researcher adopted the executive function scale which was based on McCloskey *et al*. (2009). He explained the mechanism of executive functions that are carried out according to a hierarchical system that reflects the development and interaction psychological and neurological functions of the frontal cortex of the brain. These functions are distinct and relatively independent as described in the theoretical framework of the research.

Quantum sense test: The process of constructing the scale begins by defining the theoretical background and specifically the theory according to which the concept that defines the components and paragraphs of the scale is derived. Through, its presentation of theories related to the sense of quantity, the researcher found only a model related to his research in this concept, the main assumption of this model which was built on the basis is that the efficiency levels of the quantity describe the transition or shift from procedural action by counting to a growing conceptual understanding of the meaning of the words, these levels work simultaneously for word count and numbers.) It is assumed that the child may reach the third level of proficiency for small numbers while still working at the second level.

Defining the concept/executive functions: Is a structured questionnaire developed to evaluate executive functions and associated behaviors by estimating the daily activities of individuals between 5 and 18 years.

Sense of quantity: Genovese *et al*. (2005) defines it as the ability to identify quantity as a comparison between two quantities or the order of a set of quantities which is one of the main manifestations of mathematical ability. This ability does not follow general cognitive competence but is one component of the complex cognitive system which includes many elements (such as quantity, numbers, procedures and strategies) identification of executive components/functions.

The scale consists of (86) paragraphs given to teachers and the scale has three alternatives (often, rarely) to assess the behavior of individuals during the last months of the study.

The scale consists of (9) sub-scales (fields): The scale of the response (rest reflex) Inhibit. The measure of the shift/measures the flexibility of thinking and the ability to change thinking in a timely manner and the ability to make changes and transformations from one thing to another emotional control/measures the ability to control, control and modify emotional responses. Initiate measure/measures the ability to start the task or solve the problem independently.

Working memory/measures the ability to retain and process information in order to complete any activity. Plan/organize/measures the ability to set goals and develop steps to achieve goals. Organization of materials/measures the ability to understand the important concepts and organization of the tool, the ability of the child or pupil to organize his school tools and bedroom. Bed and keep the room arranged.

Monitor/measure the ability to monitor the self and the extent of impact student behavior on others and monitor the ability to perform and accuracy of achievement to achieve the goal. Clinical additional items/measures some clinical cases (such as growth disorder, brain injury, attention deficit disorder and hyperactivity) have a direct impact on the difficulty of executive functions. This measure takes 15-20 min for the teacher to complete.

Quantum sense test: The researcher analyzed the concept of sense of quantity which is a biological activity is the biological sense of the child or student in the knowledge of large quantities and long and small and distinguish them from small and small and short and also are skills of visual memory and optical memory-spatial and then read the number and matching which is the main component that is light the concept areas were identified and on the basis of which the test questions and the definitions mentioned for this concept could be formulated.

Accordingly, these abilities have been used in the preparation of the quantitative test and the test areas are:

- First field/ranking.
- Second domain/whichever is more
- Third domain/are the quantities equal
- Field IV/match includes
- Formulation of paragraphs of search tools

After the researcher studied the tools of research, namely the scale of executive functions and testing and sense of quantity as well as theoretical frameworks and previous studies and literature related to the current research. The researcher has relied on paragraphs that correspond to the Iraqi cultural environment as follows.

Executive functions: Gioiq *et al.* made it suitable for third graders, taking into account the meaning and concept of its paragraphs according to the standards and procedures for translating the scale. The index consists of (86) paragraphs distributed over (9) of the measures are (The response threshold includes (10) paragraphs, the shift of attention includes (10) paragraphs, emotional control includes (9) paragraphs, (10) paragraphs, the planning and organization includes (10) paragraphs, the organization of tools includes (7) paragraphs, the observation (includes (10) paragraphs, the clinical includes (13) (Slightly, sometimes, never) and take weights (1-3).

Determination of quantification test paragraphs: After examining the sources, literature and studies that dealt with the concept of sense of quantity and after defining the procedural definition, the researcher formulated all the vocabulary of the test in a cameraman style, through four areas (the order consists of (8) paragraphs and whichever is more and includes (10) paragraphs and whether the quantities equal (10) (12 paragraphs) and thus the number of paragraphs of the test is (40) paragraph where the researcher drew her ideas in the preparation of paragraphs (questions) of this test after the knowledge of many sources of Foreign and Arabic which includes some activities and tasks that can measure some aspects of mental related variable. The study (sense of quantity) in the students of the third grade of primary and in the same age group in addition. The second part was presented by Prof. Abdul Hamid Sulaiman in his book "Difficulty of Quantification" (2014). The test paragraphs were formulated to suit the Iraqi environment. The test alternatives were developed (yes or no) and their weights (1, 0).

Translation of executive function scale

The researcher followed the following steps:

- Translation of the standard from English to Arabic with the help of a specialist in English
- Re-translate the standard from Arabic to English with the help of another specialist in English

Presentation of the English versions to Arabic and vice versa to another professor specialized in English to show the extent of agreement between the translations and supported the existence of an agreement between them

Presentation of the scale after the translation into Arabic on one of the professors specialized in Arabic language to demonstrate the safety of the language of the standard paragraphs.

Logical analysis of paragraphs: This process indicates the identification of the scale representation of the variable to be measured. To verify this, the sections of the executive and experimental functions were presented in the visual and numerical perception of the numbers and the sense of quantity in preliminary form to (20) specialized educational and psychological sciences supervisors (1) formulation of the scale and test paragraphs and their suitability for the component to which they belong. The results showed that the calculated value of the executive function scale ranged between (9.8-20) while the calculated value of the two tests ranged from (6.22-20) (12.8-20) to test the sense of quantity which is higher than the value of (k2) of the scale (3.84) at the level of significance (0.05) and the degree of freedom (39).

Experience clarity of instructions and paragraphs: The experience of clarity of instructions and paragraphs is a prerequisite for the basic experiment without which the credibility of the research work can not be verified. The main objective of this experiment is to identify the extent of the clarity of the paragraphs and instructions of the scale by detecting the ambiguous and unclear paragraphs for the purpose of modification as well as the time taken to answer the paragraphs of the scale and to adjust the instructions of the scale and to achieve this, the three tools were applied to a random sample of the research community of 40 male and female students is equal in gender as in Table 1. It was found that the paragraphs of the scale and the tests and their instructions are clear for the sample. The time taken to answer the function scale was calculated and it was shown to be between 18-22 min and with an average time of 19 min. The sense of quantity showed that the length of time The answer to the test as a whole ranged from 15-20 to an average of 17, so this average was taken as a time-frame for the test (Table 1).

Table 1: A table showing sample experience clarity instruction

School name	Sex	No.	Total
Safad Primary School	Male	20	20
Badr Al-Kubra Primary School	Female	20	20
Total			40

RESULTS AND DISCUSSION

Statistical analysis of paragraphs: Statistical analysis is an important condition in the research procedures of the level of difficulty and degree of discrimination between the upper and lower levels of the attribute or the capacity measured by the test in the light of a particular internal or external test (Anderson, 2015).

Hence, the researcher applied the three research tools to the statistical analysis sample of (389) students and students who were selected in the random stratified method of proportionate method. Then, the scale was corrected and the following characteristics were extracted.

The power of excellence one of the important characteristics that should be available in the vocabulary of tests is the distinction which is the ability to measure individual differences by the vocabulary of these tests (Anderson, 2015).

Where the power of excellence is the indicator of the differences BM respondents who obtained high grades and obtained the low grades in the attribute to be measured. The power of excellence is based on the two groups where the total number of individuals is divided into two categories (the upper and lower groups) and the coefficient of distinction between the two groups for each paragraph (Anderson, 2015).

Therefore, the researcher followed the following steps in finding the power of excellence: the measuring tools were applied to the statistical sample of (389) students and students and then the researcher corrected the measuring instruments. Order the total scores of the scale and the two tests in descending order.

Selection of a percentage (27%) of the forms with high grades to represent the top group and the number (105). Choose a percentage (27%) of the forms with low grades to represent the minimum group and the number (105). To extract the coefficient of excellence by using the t-test for two equal samples for the executive functions of the scale as a whole and for each of its fields. While the researcher used the equation of discrimination to test the visual perception of the numbers and the sense of quantity and difficulty.

It was found that the values of (t) calculated ranged from (0.002- 9.896). When compared with the value of (t) the table at the level of (0.05) and the degree of freedom (208) of (3.84) 5, 15, 16, 27, 30, 32, 41, 47, 49, 51, 54, 62, 63, 66, 70, 74, 75, 77, 79, 80, 82) is not statistically significant. The executive power of the executive functions scale was calculated according to its fields. As for the distinct paragraph of the fields of the scale, it appeared that it ranged from (7,083-3,901), all higher than the value of (t) the scale of (3.84) at the level of significance (0,05) and degree of freedom (39).

Coefficient of difficulty and ease: The difficulty of the test paragraphs (sense of quantity) was calculated according to the method of the two terminal samples (0.171- 0.895). When compared with the Ebel scale at 0.05 and 208, we find that paragraph (17) is not statistically significant

Similarly, the degree of difficulty of the quantitative sense test scores ranged from 0.0238 to 0.9142. According to Mayr Bloom and Downey, the extent of the difficulty of the accepted paragraphs ranged between 0.20 and 0.80. It was found that there were (10) paragraphs with difficulty values of <20% or more than 80% or more which are (7, 9, 11, 14, 16, 18, 20, 23, 27, 28) which are statistically insignificant.

Internal consistency: The main purpose of the internal consistency which is an important procedure of the research, through which it can be known whether each paragraph of the scale is the same path in which the scale is moving and can be verified by the use of statistical methods by finding the interrelationships between.

The method of linking the degree of the paragraph to the total degree of the scale. It was found that the values of the correlation coefficients of the paragraph in the total measure of the executive function measure ranged from (0.256-0.6805). When compared with the scale value of (0.098) at the level of significance (0.05) and the degree of freedom (387) in terms of the quantitative sense test, it was found that all the values of the point Bisereal correlation coefficient ranged between (-0.103-0.644). When compared with the value of the correlation coefficient at the level of (0.05) and the degree of freedom (387) of (0.098) statistical significance. The method of linking the degree of the paragraph to the degree to which it belongs.

The correlation between the degree of each paragraph and the total degree of the field to which it belongs is determined by using the Pearson correlation coefficient for the executive function measure and the Pointerial correlation coefficient to test the sense of quantity.

All the values of the correlation coefficients of the paragraph in the total degree of the field to which they belong to the executive function scale are higher than the scale value of the coefficient of correlation (0.098) at the level (0.05) and the degree of freedom (387).

It was found that all the values of the correlation coefficients of the paragraph in the total degree of the field to which the test of the sense of quantity is higher than the scale value of the correlation coefficient of (0.098) at the level (0.05) and the degree of freedom (387). The method of correlation of the degree of field to the total degree of the scale.

The main objective of this method is to find the correlation between the scores of individuals responding to each field and the total score of the executive function and the sense of quantity. The procedure used Pearson correlation coefficient and it was found that the calculated grade for each field in the overall grade is statistically significant when compared to the scale (0.96) at the level of significance (0.05) and the degree of freedom (388). It was found that all the values of the correlation coefficients of the field degree by the total degree of the executive function and the sense of quantity are higher than the scale value of the correlation coefficient of (0.098) (0.05) and degree of freedom (387).

Cykometric properties of research tools: The basic conditions that should be provided in the educational and psychological research tools are the cykometric characteristics and their purpose is to increase the accuracy of the tools used in the research in order for these tools to be effective and appropriate in measuring the search variables giving us a quantitative description of the measured phenomenon. And the most important of these characteristics is honesty and consistency and on this basis has achieved the researcher of the validity and stability of the tools used in the research agencies.

Honesty: The researchers used several methods to extract the sincerity of the executive function scale and sense of quantity as follows.

True translation: The researcher verified the veracity of translating the executive functions standard by translating the scale from English to Arabic and then re-translating it into English by an English specialist. The translation was then presented to an expert in English to ensure the integrity of the translation and its validity. Linguistics in accordance with the Iraqi environment and then presented the final version to a specialist in Arabic language to ensure linguistic integrity.

Virtual honesty: For the purpose of verifying the veracity of both the executive function and the quantitative sense test, the search tools were presented in a preliminary form to a number of arbitrators who are competent in the Department of Educational and Psychological Sciences to judge the extent to which the scales are consistent with the definitions adopted by the researcher and the extent to which these tools are suitable for the research sample. This was explained when talking about the logical analysis of tools as stated in the page.

Honest construction: The researchers investigated this kind of honesty through two indicators: the power of excellence and the internal consistency. The power of the executive function scale was calculated for each of its fields as well as the calculation of the qualitative force to test the sense of quantity. In addition, to calculating the correlation of the degree of the paragraph in the field and the field in the total degree of the scale. The coefficient of correlation between the degree of the paragraph and the total score of each of the tests of the visual velocity of the numbers and sense of quantity was calculated. Rat non-statistical significance at the level (0.05).

Stability: The aim of estimating the measurement errors of the executive function test and the sense of quantity test were two method.

The way of the Vaccronbach: Stability is calculated according to this method by splitting the scale into several possible parts. After that, the average coefficient of fracture stability is calculated. The stability coefficient is called the homogenization coefficient.

The researcher adopted this method to find the stability value for the executive function scale by subjecting the teacher's answers on this scale to the statistical analysis of (40) form. After using the Cronbach alpha method it became clear that the stability coefficient of the executive function as a whole is 0.956. The internal consistency of the scale is good.

Method of re-testing: To achieve this, the executive function scale was applied and the sense of quantity was tested on a sample of 40 students from my school (Safad for Boys and Badr for Girls) and randomly selected from both schools.

After 15 days, the two tests were re-applied to the individuals themselves and then the forms of individual responses were corrected on the functional functions and experimental tests of the pharyngeal perception of the number and sense of quantity. After calculating the correlation coefficient, the researcher extracted the stability coefficient between the two application grades using Pearson correlation coefficient stability (0.870) for the testing of the visual-spatial perception of the numbers and (0.7714) for the sense of quantity. The stability coefficient of the executive function index (0.887) was a good correlation coefficient.

Table 2: Identify the level of executive fuctions of third grade students

Variable	Arithmetic mean	SD	Theoretical center	t-values Calculated	t-values Table	Significance at a level 0.05
Executive functions	98.79	19.86	**126**	27.021	1.96	Function

View interpret and discuss results: This study includes a presentation of the results of the research according to the goals set for it. And to verify these goals and to find appropriate explanations for each outcome and discussed in light of the theoretical framework and previous studies and then conclusions, recommendations and proposals that were developed in accordance with the results analyzed and the chapter is reviewed as follows.

Objective 1: To identify the level of executive functions of third grade students. After the application of the executive function measure on the sample of (389), their scores were analyzed on the scale and they were between (62-174) with an average of (98.79) and a standard deviation of (19.86) The average achieved is smaller than the average mean of (126). For the purpose of knowing the statistical significance of the apparent differences, the t-test was used for one sample and the results shown in the Table 2 are shown. The above table shows that the calculated value of t is -27,021 which is higher than the tabular value of (1.96) -regardless of the reference at the level of significance (0.05) and the degree of freedom (388).

This may be due to the fact that the curriculum received by students in the first and second grades as well as the third may help to stimulate those functions as well as the frontal lobe, the largest cerebral cortex which occupies about one third of the area of the cerebral cortex and is responsible for a wide range of thought and behavior and emotions, on the performance and sequence of all simple and complex motor skills and executive functions which include attention, thinking, governance, problem solving, creativity, emotion regulation and control of motivation and awareness.

And that the areas responsible for executive functions in the brain are the anterior frontal area of the brain and specifically posterior, cortical, cortical and subcortical cortices (Matsumoto, 2009). Bascandziev *et al*. (2016) and Zhang (2016) that the executive functions are linked to the early academic abilities of the child, confirming their crucial role in learning assimilation and performance (Cragg and Gilmore, 2014). In the various educational curricula, especially, in the acquisition of mathematics and reading skills in the early years of the child's age but predict their educational level in subsequent years because they control the processes responsible and included in cognitive learning. On the other hand, Bascandziev *et al*. (2016) pointed out that executive functions are related to student readiness more than IQ.

Objective 2: To identify the statistical significance of executive posts by gender. The second objective of the present study is to identify the differences of statistical significance in the level of executive functions according to the gender variable. For the purpose of achieving this objective, the calculation of males was calculated and it was found that it was 83.42 vs. 116.97 for females and a standard deviation of 11,216 for males. The 12,299 for females and because the standard deviation of the small sample (females) is greater than the standard deviation of the large sample (males), the test (P) was used and the calculated value was 0.83 and is smaller than the scale value of (1), 26) at an indication level (0.05) and two degrees of freedom (184, 203). A return indicates that when the small sample variation (t-test) (1988). The t-test was then used for two independent samples in order to identify the statistical significance of the apparent differences of the investigated middlemen (male and female) (Table 3).

From the table above, the calculated value of (28,686) is greater than the tabular value of (1.96) at the level of (0.05) and the freedom score (387) for males. This means that males have a better level of females in executive jobs and may be due to the fact that males have activity in the frontal lobe may exceed the activity of the frontal lobe of females and this is because the activities practiced by males are more generally than females as well as the social interaction of males does not shorten on the perimeter of the family but on a broader level of females.

The third objective is to identify the level of sense of quantity among third grade students. For the purpose of achieving this goal, the researcher adopted the arithmetic mean, the mean mean and the standard deviation in order to use test (t) for one sample to calculate the difference between the two averages. It was found that the mean mean of the scale is (15) while the mean value (17.27) (5.580). For the purpose of identifying the statistical significance of the apparent differences use t test for one sample and the results shown in Table 3 are shown.

Table 3: Calculated and tabular value of differences in executive posts according to sex variable

	t-values					p-values				
Significance	Table	Calculated	SD	Arithmetic mean	Significance	Table	Calculated	Variance	العدد	Sex
Function	1.96	28.686	11.216	83.420	Not functional	1.26	0.83	125.820	204	Male
	-	-	12.299	116.97	-	-	-	151.126	185	Female

Table 4: Calculated and tabulated value (t) to test sense of quantity

	t-values						
Significance	Table	Calculated	SD	Arithmetic mean	The mean medium	No. of paragraphs	The test
Function	1.96	8.021	5.580	17.27	15	30	Sense of quantity

From the table above, the calculated value of (8.021) is higher than the tabular value of (1.96) at the level of significance (0.05) and the degree of freedom (388) which proved to be a statistical function. This means that third-grade students have a good level of sense of quantity and this may be due to the impact of the curriculum and especially, the arithmetic that contributes well to the growth of the sense of quantity in the students.

This was confirmed by the researchers from the need to train and teach the child skills related to quantitative treatment and the relationship between quantity and number and sequence of quantities and comparison between quantities in the first two grades in the primary stage.

This finding also correlates with the study of Park which showed neurogenic mechanisms in the prefrontal cortex region responsible for the direct perception of the visual sense of numbers in early and middle childhood children which subsequently, results in the ability to interpret the neurotransmitters of nonverbal ability human innate. Moreover, Bartelet *et al*. points out that a child in his daily life is usually required to make decisions regarding quantitative information and simple numbers.

Objective 4: To identify the differences of statistical significance of the sense of quantity, according to the gender variable. After the analysis of the student's answers, it was found that the male arithmetic mean was 17.258 and the standard deviation was 5.661. For females, the mean (17.282) and the standard deviation (5.499). To identify the differences according to the sex variable, the researcher adopted a test for two independent samples, shown in the Table 4.

Table 4 shows that the calculated value of (t) is 0.1076 which is less than the tabular value of (1.96) at the level of significance (0.05) and the degree of freedom (387). This means that there are no statistically significant differences depending on the gender variable in the sense of quantity. This may be due to the exposure of students of both sexes to the same curriculum and vocabulary as well as the methods of instruction used at the primary level in particular the third grade of primary education.

Objective 5: Identify students with difficulty in sense of quantity. In order to identify students with difficulty in sense of quantity, the accepted mean was used to test the sense of quantity (15) as a cutoff point, meaning that students whose scores in the test were <(15) experienced difficulty in feeling quantity and (57) students and (69) students as shown in Table 5.

The above Table 5 shows that (32.3%) of the total number of students have difficulty in feeling quantity which is high compared with previous studies. This may be due to the weakness of the methods of teaching mathematics or the poor scientific level of teachers and teachers supervising the teaching of mathematics courses in this class or the lack of opportunity for real interaction between teacher/teacher and students, especially, in overcrowding classrooms and beyond the normal limit.

Objective 6: To identify the correlation between executive functions, difficulty in sense of quantity, extent of contribution of executive functions, difficulty in sense of quantity among primary school students.

For the purpose of identifying the correlation between executive functions and the difficulty of sense of quantity and the relative contribution of executive functions and sense of quantity, the correlation was calculated according to Pearson correlation coefficient and the results shown in Table 6 are shown.

From the Table 6 above, the correlation coefficients between each of the executive functions and the operational functions as a whole with difficulty in sense of quantity were (-0.350, -0,307, -0.356, -0.332, -0.371, -0.334, -0.467, -0.421, 0,212, -0,492) (stop response, attention shift, emotional control initialization, working memory, planning and organization organization of tools, control, clinical, executive functions as a whole). All of these are statistically significant. Executive functions and the difficulty of sense of quantity. These results are consistent with my studies (Keogh, 1992; Mamen,

Table 5: A table showing the calculated value (t) of two independent samples

Significance	Table	Calculated	SD	Arithmetic mean	No.	Sex
Not functional	1.96	0.1076	5.661	17.258	204	Male
			5.499	17.282	185	Female

Table 6: Number of students with difficulty in sense of quantity

No. of students with difficulty in sense of quantity	Cutting point	Total No.	Sex
57	15	204	Male
69		185	Female

Table 7: The correlation between each area of executive functions and the measure of executive functions as a whole and difficulty in sense of quantity

الدلالة significance	SE for B	Correlation coefficient box	Coefficient of correlation R	Independent variables
0.000	2.468	0.122	0.350	Stop responding
0.000	2.508	0.094	0.307	Transient shift
0.000	2.462	0.133	0.356	Emotional adjustment
0.000	2.486	0.110	0.332	First
0.000	2.447	0.137	0.371	Working memory
0.000	2.474	0.118	0.344	Planning and organization
0.000	2.330	0.218	0.467	Organization of tools
0.000	2.390	0.177	0.421	Monitoring
0.017	2.575	0.044	0.212	The clinical
0.000	2.95	0.242	0.492	Executive functions
0.000	2.390	0.177	0.421	Monitoring
0.017	2.575	0.044	0.212	The clinical
0.000	2.95	0.242	0.492	Executive functions

2007) which emphasizes that children with learning difficulties have problems in understanding and understanding many key concepts such as quantity and time. It is difficult for them to match quantities and understand simple concepts of quantity such as different, more/less, bigger/smaller, add to/take from once/twice/ ten times and others (Keogh, 1992; Mamen, 2007) (Table 5 and 6).

For the purpose of predicting the difficulty of sense of quantity according to each of the fields of executive functions, the researcher used linear regression analysis to obtain the numerical value as shown in table. The results of the regression analysis in Table 7 show that there are positive statistical indicators for the contribution of each of the fields of the executive functions (independent variables) in the dependent variable (sense of quantity). The calculated alpha values are 17,321, 12,867, 18,022, 15,352, 19,832, 16,639 (34,587, 26,701, 5,815, 39,516) (response threshold, attention shift, emotional control initialization, working memory, planning/organization organization of tools, control in the field of organization of tools, the smallest value was (5,815) in the field of (clinical). All of which have statistical significance at the level of significance (0.05) and degrees of freedom (1.124).

To determine the extent of the relative contribution of each functional function area in the dependent variable, the difficulty of quantification by reversing regression coefficients in crude grade prediction and the corresponding values of the relative contribution, standard error and calculated t values, the results shown in Table 8 are shown.

As shown in the above Table 8, there is a relative contribution to the independent variables and their distance in the dependent variable, since, the values of (B) for the relative contribution were (12,930, 11,777, 11,918, 11,577, 12,090, 12,441, 14,423, 14,258, 9,860, 17,925) emotional shift initialization, working memory, planning/ organizing, tooling, monitoring, clinical and scale as a whole).

The results in Table 8 indicate that the relative contribution values of the independent variables (the fields of executive functions and the measure of executive functions as a whole) in the difficulty of sense of quantity reached (-0.291, -0.374, -0.373, -0.421, -0.287, 0.308, -0.528, -0.392, -0.189, -0.075) for fields (response threshold, attention shift, emotional adjustment initialization, working memory, planning/organization organization of tools, observation and the amount of the relative relative contribution of beta values (-0.350, -0.307, -0.366, -0.332, -0.371, -0.344) (0.122, 0.094) for areas (stop response, attention shift, emotional adjustment initialization, working memory, planning/organization organization of tools, observation (0.133, 0.110, 0.218, 0.118, 0.244, 0.242) for the domains listed, respectively (Table 9).This means that the executive functions together contribute to the interpretation of (24.2%) in the difficulty of sense of quantity in isolation from other factors. The sense of quantity is the field of regulation of tools with a value of beta box (0.218) that is it contributes to the interpretation (22%) of the variance explained in degrees of difficulty sense of quantity (13.7%) followed by emotional adjustment (13.3%), followed by the response (12.2%), while The lowest contribution rates were for the

Table 8: The results of the alpha test for linear regression analysis for both the executive function fields and the executive function scale as a whole and the difficulty of sense of quantity

Level of significance (Sig.)	Alphanumeric F-values	Average Squares (MS)	Degrees of freedom (df)	Total Squares (SS)	Source of Variance (SV)	Independent variables
0.000	17.321	105.526	1	105.526	Regression	Stop responding
		6.092	124	755.466	Residual	
			125	860.992	Total	
0.000	12.867	80.943	1	80.943	Regression	Transient shift
		6.291	124	780.049	Residual	
			125	860.992	Total	
0.000	18.022	109.259	1	109.259	Regression	Emotional adjustment
		6.062	124	751.733	Residual	
			125	860.992	Total	
0.000	15.352	94.852	1	94.852	Regression	First
		6.179	124	766.140	Residual	
			125	860.992	Total	
0.000	19.832	118.718	1	118.718	Regression	Working memory
		5.986	124	742.274	Residual	
			125	860.992	Total	
0.000	16.639	101.862	1	101.862	Regression	Planning/organization
		6.122	124	759.130	Residual	
			125	860.992	Total	
0.000	34.587	187.777	1	187.777	Regression	Organization of tools
		5.429	124	673.215	Residual	
			125	860.992	Total	
0.000	26.701	152.548	1	152.548	Regression	Monitoring
		5.713	124	708.444	Residual	
			125	860.992	Total	
0.000	5.815	38.566	1	38.566	Regression	The clinical
		6.632	124	822.426	Residual	
			125	860.992	Total	
0.000	39.516	208.073	1	208.073	Regression	Executive functions
		5.265	124	652.919	Residual	
			125	860.992	Total	

Table 9: Contribution of the areas of executive functions in the sense of quantity

Level of significance	Calculated t-values	Benchmark coefficient beta	Indirect transactions		Variables	
			SE	The value of the relative contribution (B)		
0.000	8.366	-0.350	1.545	12.930	Fixed limit	Stop responding
0.000	4.162		0.700	-0.291	Relative contribution	
0.000	8.009	-0.307	1.470	11.777	Fixed limit	Transient shift
0.000	3.587		0.104	-0.374	Relative contribution	
0.000	9.309	-0.366	1.280	11.918	Fixed limit	Emotional adjustment
0.000	4.245		0.880	-0.373	Relative contribution	
0.000	8.915	-0.332	1.299	11.577	Fixed limit	First
0.000	3.918		0.107	-0.421	Relative contribution	
0.000	9.595	-0.371	1.260	12.090	Fixed limit	Working memory
0.000	4.453		0.064	-0.287	Relative contribution	
0.000	8.555	-0.344	1.458	12.441	Fixed limit	Planning/organization
0.000	-4.079		0.078	-0.308	Relative contribution	
0.000	10.665	-0.467	1.352	14.423	Fixed limit	Organization of tools
0.000	-5.881		0.090	-0.528	Relative contribution	
0.000	9.479	-0.421	1.504	14.258	Fixed limit	Monitoring
0.000	-5.167		0.078	-0.392	Relative contribution	
0.000	7.113	-0.212	1.366	9.860	Fixed limit	The clinical
0.000	-2.411		0.078	-0.189	Relative contribution	
0.000	9.855	-0.492	1.819	17.925	Fixed limit	Total executive scale
0.000	-6.286		0.012	-0.075	Relative contribution	

(attentional and clinical shift) where the explained variance was (9.4 and 4.4%) for the two fields mentioned, respectively. From here, it can be concluded that executive functions are a powerful predictor of predicting the difficulty of sense of quantity and that the most powerful predictor is the organization of tools.

These results are consistent with Soltesz *et al*., (2011) where it emphasizes that the combined growth of the executive functions and the numeracy skills are differentiated in numerical growth and that the important implications of their study results are that developmental changes affect behavioral outcomes in tasks the simple

numerical comparison may occur at the level of the executive function instead of the level of numerical processing skills and therefore, the developmental difficulties in the executive functions play a fundamental role (logically) in the growth of dyscalculia (Soltesz *et al*., 2011).

This is consistent with the study by Soltesz *et al*. (2011) which emphasizes the need to distinguish and distinguish between operational processes or functions and numerical processes in the developmental process of numerical processing during the first stages of primary education. He believes that there is an effect of numerical distance on the representation of quantity in the brain as demonstrated by the results of neuroimaging studies of brain activity. Where quantitative processing is highly dependent on the frontal functions of the brain as well as in the decision to quantify judgment, depending on the ability to regulate the response and to stop spontaneous response as key operational functions (Soltesz *et al*., 2011).

CONCLUSION

The research of executive jobs among students in the third grade of primary in general is good and that males in general somewhat better in the performance of those jobs. Third-grade students have a good sense of quantity and there is no significant difference in this level between males and females. Although, the students of the third grade of the primary level of good sense of quantity but a large proportion of students have difficulty in sense of quantity and are present in females somewhat larger than males.

There is a clear correlation between the deficiencies in the performance of executive functions and the difficulty of the sense of quantity among students in the third grade primary. Executive functions can effectively predict the sense of quantity and the lack of these functions contribute to explain the difficulty in feeling the quantity of students in the third grade primary. Although, all areas of executive functions contribute to the prediction of the quantitative sense, there is a difference between these areas in terms of the strength of contribution as the organization of the most contributing and clinical instruments is less contribution.

RECOMMENDATIONS

Adoption of the standards prepared in the current study as diagnostic tools in primary schools. Early identification of students who have difficulties in mathematics and work to address them early through programs designed for this purpose. Enrich the curriculum, especially, in the subjects of mathematics and science which contribute to the development of the sense of quantity among primary school students. The need for early detection of students who have behavioral problems related to response initiation organization and planning to address them early. The need to train and teach the child skills related to the quantitative treatment and the relationship between quantity and number and the sequence of quantities and the comparison between the quantities in first two grades in the primary stage because they constitute the main knowledge in mathematics and neglect of this aspect results in many problems.

Proposals according to the findings of the researcher, she proposes the following studies: a training program to develop the sense of quantity among third grade students. Training program to develop the executive functions of students in the third grade primary. Executive functions and their relationship to the patterns of learning and thinking among primary school students. Conduct a similar study for the current study of primary school students for other grades of primary school. Executive functions and their relationship to a number of variables (mental abilities, multiple intelligences, mental disorders etc). Sense of quantity and its relationship to the difficulties of learning mathematics.

REFERENCES

APA., 2015. APA Dictionary of Psychology. 2nd Edn., American Psychological Association, Washington, D.C., USA., ISBN:9781433819445, Pages: 1204.

Anderson, J.R., 2015. Cognitive Psychology and its Implications. 8th Edn., Worth Publishers, New York, USA., ISBN:978146414891O, Pages: 406.

Anderson, P.J. and N. Reidy, 2012. Assessing executive function in preschoolers. Neuropsychology Rev., 22: 345-360.

Andersson, U. and R. Ostergren, 2012.. Number magnitude processing and basic cognitive functions in children with mathematical learning disabilities. Learn. Individual Differences, 22: 701-714.

Bascandziev, I., L.J. Powell, P.L. Harris and S. Carey, 2016. A role for executive functions in explanatory understanding of the physical world. Cognitive Dev., 39: 71-85.

Bull, R. and K. Lee, 2014. Executive functioning and Mathematics achievement. Child Dev. Perspect., 8: 36-41.

Cantin, R.H., E.K. Gnaedinger, K.C. Gallaway, M.S. Hesson-McInnis and A.M. Hund, 2016. Executive functioning predicts reading, Mathematics and theory of mind during the elementary years. J. Exp. Child Psychol., 146: 66-78.

Clements, D.H., J. Sarama and C. Germeroth, 2016. Learning executive function and early Mathematics: Directions of causal relations. Early Childhood Res. Q., 36: 79-90.

Cragg, L. and C. Gilmore, 2014. Skills underlying Mathematics: The role of executive function in the development of Mathematics proficiency. Trends Neurosci. Educ., 3: 63-68.

Emerson, J. and P. Babtie, 2014. The Dyscalculia Assessment. Bloomsbury Publishing, London, UK., ISBN:9781472921000, Pages: 208.

Genovese, E., R. Galizia, M. Gubernale, E. Arslan and D. Lucangeli, 2005. Mathematical vs. Reading and Writing Disabilities in Deaf Children: A Pilot Study on the Development of Numerical Knowledge. In: Cognition and Learning in Diverse Settings (Advances in Learning and Behavioral Disabilities), Scruggs, T.E. and M.A. Mastropieri (Eds.). Emerald Group Publishing Limited, Bingley, UK., ISBN:978-0-76231-224-5, pp: 33-46.

Gersten, R., N.C. Jordan and J.R. Flojo, 2005. Early identification and interventions for students with Mathematics difficulties. J. Learn. Disabilities, 38: 293-304.

Huber, S., D. Sury, K. Moeller, O. Rubinsten and H.C. Nuerk, 2015. A general number-to-space mapping deficit in developmental dyscalculia. Res. Dev. Disabilities, 43: 32-42.

Keogh, B.K., 1992. Learning Disabilities in Preschool Children. In: Diagnosis and Management of Learning Disabilities: An Interdisciplinary/Lifespan Approach, Brown III, F.R., E.H. Aylward and B.K. Keogh (Eds.). Springer, Berlin, Germany, ISBN:978-1-4899-7272-9, pp: 19-33.

Lindsay, R.L., T. Tomazic, M.D. Levine and P.J. Accardo, 1999. Impact of attentional dysfunction in dyscalculia. Dev. Med. Child Neurol., 41: 639-642.

Mamen, M., 2007. Understanding Nonverbal Learning Disabilities: A Common-Sense Guide for Parents and Professionals. Jessica Kingsley Publishers, London, UK., ISBN:9781846426742, Pages: 176.

Matsumoto, D., 2009. The Cambridge Dictionary of Psychology. Cambridge University Press, New York, USA., ISBN:9780521854702, Pages: 608.

McCloskey, G., L.A. Perkins and B.V. Diviner, 2009. Assessment and Intervention for Executive Function Difficulties. Routledge Company, Abingdon, UK., ISBN:9780415957847, Pages: 362.

Meltzer, L. and K. Krishnan, 2007. Executive Function Difficulties and Learning Disabilities. In: Executive Function in Education: From Theory to Practice, Meltzer, L. (Ed.). Guilford Press Company, New York, USA., ISBN:9781593854287, pp: 77-105.

Miyake, A., N.P. Friedman, M.J. Emerson, A.H. Witzki and A. Howerter *et al.*, 2000. The unity and diversity of executive functions and their contributions to complex frontal lobe tasks: A latent variable analysis. Cognit. Psychol., 41: 49-100.

Ness, D., 2005. Development of Quantitative and Spatial Thinking. In: Encyclopedia of Education and Human Development, Farenga, S.J. and D. Ness (Eds.). M.E. Sharpe Company, Armonk, New York, USA., ISBN:9780765621085, pp: 727-771.

Pennington, B.F. and S. Ozonoff, 1996. Executive functions and developmental psychopathology. J. Child Psychol. Psychiatry, 37: 51-87.

Salimpoor, V.N. and M. Desrocher, 2006. Increasing the utility of EF assessment of executive function in children. Dev. Disabilities Bull., 34: 15-42.

Soltesz, F., U. Goswami, S. White and D. Szucs, 2011. Executive function effects and numerical development in children: Behavioural and ERP evidence from a numerical Stroop paradigm. Learn. Individual Differences, 21: 662-671.

Szucs, D., F. Soltesz, E. Jarmi and V. Csepe, 2007. The speed of magnitude processing and executive functions in controlled and automatic number comparison in children: An electro-encephalography study. Behav. Brain Funct., 3: 1-20.

Zhang, X., 2016. Linking language, visual-spatial and executive function skills to number competence in very young Chinese children. Early Childhood Res. Q., 36: 178-189.