

## Executive Functions among Fifth-Grade Pupils with Reading Difficulties from the Perspectives of Teachers and Parents: A Field Study in Some Elementary Schools in El-Oued

Hind Ghedhaifi<sup>\*</sup>

<sup>1</sup> Echahid Hamma Lakhdar University of El Oued(Algérie), ghedhaifi-hynd@univ-eloued.dz  
Social Development and Community Service Laboratory ,University of El Oued(Algérie)

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### Abstract

This study aims to investigate individual differences in executive functions among fifth-grade elementary pupils with reading difficulties, according to the variable of gender, as perceived by teachers and parents. The research questions were formulated as follows: Are there statistically significant differences in the executive functions of final-stage elementary pupils with reading difficulties, as reported by teachers, based on the gender variable (males vs. females)? Are there statistically significant differences in the executive functions of final-stage elementary pupils with reading difficulties, as reported by parents, based on the gender variable (males vs. females)? The comparative descriptive methodology was adopted due to the nature of our subject, and data collection relied on the Executive Functions Scale. The study included a sample of 80 participants, consisting of 40 males and 40 females, selected purposefully. The findings revealed that there were no statistically significant differences in the executive functions of final-stage elementary pupils with reading difficulties, as perceived by teachers, based on the gender variable (males vs. females). However, there were statistically significant differences in the executive functions of final-stage elementary pupils with reading difficulties, as perceived by parents, based on the gender variable (males vs. females).

**Keywords :** Reading difficulties, executive functions, pupils, parents, teachers.

<sup>\*</sup>.Corresponding Author.

## I- Research Methodology

The methodology refers to the scientific approach followed by the researcher to achieve the intended objective of the study. Our study aims to identify the presence of differences in executive functions among fifth-grade pupils with reading difficulties based on the gender variable, as perceived by teachers and parents. Therefore, we have chosen the descriptive methodology with a comparative approach that is suitable for this study.

The descriptive methodology is defined as an analytical method based on sufficient and accurate information about a specific phenomenon or subject within known periods. Its purpose is to obtain practical results that are objectively interpreted and aligned with the actual data of the phenomenon. This methodology aims to observe a specific phenomenon or subject in order to understand its content, or its primary objective may be to evaluate a particular situation for practical purposes (Obaidat et al., 1999, 46).

The comparative approach is used to understand how and why phenomena occur by comparing them to each other in terms of similarities and differences. Its purpose is to identify the causal factors of a specific event or phenomenon and the accompanying circumstances. It aims to uncover the links, relationships, similarities, and differences between phenomena (Aliyan and Ghunaim, 2000, 56).

### 1. The Survey Study

#### 1.1 Definition of a Survey Study

It involves identifying the conditions under which research will be conducted and the potential difficulties that the researcher may face in implementing research tools, such as conducting personal interviews or similar methods, to understand the circumstances of individuals who will be subjected to these tools or interviewed, or from whom data will be collected. It aims to assess their readiness and satisfaction with the specific procedures that will be followed, as well as to ascertain the willingness of the individuals responsible for the sample to cooperate with the researcher. Additionally, it explores other conditions that contribute to the success of the research (Mansi, 2003, 59).

#### 1.2 Objectives of the Survey Study

- To gain an understanding of the phenomenon under study and collect data about it.
- To ensure the presence of the sample and its characteristics.
- To identify potential obstacles that may hinder the study.

#### 1.3 Procedures of the Survey Study

Prior to the main application of the questionnaire, a preliminary survey was conducted. This survey serves several benefits and objectives that aid in progressing with the main study. These procedures included visiting several elementary schools in El-Oued from different areas in the city to administer the test and study its psychometric properties.

## 2. The Main Study

### 2.1 Study Sample

The study sample consisted of 25 teachers and 80 parents of enrolled pupils in one of the state schools registered in the academic year 2011-2012. The student sample included 106 participants, out of which 80 had reading difficulties, with 40 males and 40 females. The selection of participants (teachers and parents) was purposive, based on the pupils with reading difficulties. The sample is formed by specific criteria that validly represent the original population. The researcher chooses specific areas that have statistical representative characteristics and advantages for the population. This sampling approach is similar to the stratified sample, where the selected participants' size is proportional to the total number of individuals with the same characteristics in the overall population (Badr, 1996, 33).

The following indicators were considered and respected:

- Teachers should be responsible for pupils in multiple grades.
- Pupils should not be repeating the fifth grade.
- Their economic conditions should be moderate to good.

- Their family conditions should be good (parents not divorced, no cases of parental death).

## 2.2 Characteristics of the Study Sample

**Table:** Illustrating the Number of Teachers and Parents

Gender	Number of Individuals	Percentage
Teachers	25	100%
Parents	80	100%
Total	95	100%

## 3. Data Collection Tools

**3.1 Interview:** It is a verbal interaction between two individuals in a confrontational situation, where the interviewer attempts to elicit information or variables from the interviewee that revolve around their opinions (Razzouk, 1996, 129).

**3.2 Observation:** It is a deliberate, organized, and systematic attention to phenomena, events, or matters in order to discover their causes and laws (Dweidari, 2000, 114).

Observation plays a significant role in data collection by the observer, who observes the phenomena, interprets them, and identifies relationships between them. Therefore, it is an important method of data collection that contributes significantly to descriptive, exploratory, and experimental research (Awad Saber and Ali Khafaja, 2002, 143).

**4.3 Questionnaire:** The term "survey," "questionnaire," or "polling" all refer to a single data collection tool that relies on a set of written questions to obtain data that helps answer a problem or issue (Korawi, 2008, 131).

## 4. Study Instrument

### 4.1 Executive Function Brief (EFB) Scale

The Executive Function Brief (EFB) Scale is a tool designed to assess executive functioning behaviours at home by parents and in the school environment by teachers for children aged 5 to 18. This scale, developed by Gioia, Isquith, Guy, and Kenworthy in 2000 in the United States, consists of 86 items (Benjamin, 2004.8).

In our study, this scale was adopted with the permission of Professor Dr Tarek Belaj, a professor of higher education at the Faculty of Humanities and Social Sciences, Tunis. The scale was chosen because the Tunisian environment does not differ significantly from the Algerian environment, particularly in the Oued Souf region.

The scale is administered to the study sample, consisting of fifth-grade pupils, by parents and teachers. Participants are requested to place a circle around one of the three available alternatives (No, Sometimes, Often). After completing the questionnaire, it is collected, and a score is assigned to each response based on the alternative selected by the parents and teachers. The scores were awarded as follows: "Specify the scoring details based on the instructions provided in your study".

**Table:** Scores for Alternatives of the Executive Function Brief (EFB) Scale

Alternatives	No	Sometimes	Often
Positive Items	1	2	3
Negative Items	3	2	1

Next, the total scores for each individual in the study sample are calculated by summing up the scores for each item on the scale.

After obtaining the individual scores on all scale items, the scores are added together to obtain the total score. Therefore, the lowest possible score an individual can achieve on this scale is 86, while the highest possible score is 258.

Based on this, the levels of executive functioning are classified into the three levels indicated in the following table: "Provide the classification levels based on your study's criteria."

**Table:** Levels of Executive Functioning

Level	Score Range
Low Executive Functioning	86 to 143
Moderate Executive Functioning	144 to 200
High Executive Functioning	201 to 258

## 4.2 Psychometric Properties

### 4.2.1 Validity

Validity refers to the extent to which a test actually measures the intended construct, ability, trait, or attitude. It addresses the fundamental relationship between the concept we want to measure and the measurement instrument or between the trait and the intended measurement instrument (Abbas, 1996, 24).

#### 4.2.1.1 Discriminant Validity (Concurrent Validity)

This refers to the ability of the scale to distinguish between pupils who score highest in the high group and pupils who score lowest in the low group (Hussein et al., n.d., 4).

In the current study, the discriminant validity of the Executive Function Brief (EFB) Scale was calculated on the survey sample consisting of 40 individuals. The individuals were ranked in descending order based on their scores on the mentioned scale. Then, 27% of the highest-ranking individuals (11 individuals) and 27% of the lowest-ranking individuals (11 individuals) were selected. The difference between the means of these two groups was calculated using the t-test. The results obtained were as follows: "Present the results obtained based on the t-test and the significance level".

**Table:** Results of Discriminant Validity Calculation using the Bilateral Comparison Method for the Executive Function Scale

Group	N	M $\bar{H}$	A	F	M	Decision	T	D $\bar{H}$	M	Decision
Q	11	264.18	7.89	2.36	0.174	Not significant	12.83	14	0.000	Significant
D	11	172.5	14.11							

In the table above, we present the results of the discriminant validity calculation using the bilateral comparison method for the Executive Function Scale. The table includes the following variables:

-Q: Represents the results of strong individuals with high scores on the test.

-D: Represents the results of weak individuals with low scores on the test.

-N: Represents the sample size.

-M $\bar{H}$ : Represents the mean.

-A: Represents the standard deviation.

-F: Represents the significance value.

-M: Represents the level of significance ( $\alpha$ ).

-T: Represents the test value for the significance of differences.

-D $\bar{H}$ : Represents the standard deviation of differences.

Based on the table, it is evident that the calculated T-value is 12.83. Since the level of significance (M) is 0.000, which is considerably smaller than 0.05, it can be concluded that there is statistical significance.

This indicates that the scale successfully discriminates between individuals in the study sample in terms of the measured characteristic (executive functions). Therefore, the scale is considered valid and suitable for application to the primary study sample.

#### 4.2.2 Reliability

##### 4.2.2.1 Reliability using Cronbach's Alpha

Cronbach's Alpha is a coefficient that represents the average correlation among different parts obtained through test partitioning using various methods. It signifies the correlation coefficient between any two parts of the test. The formula for Cronbach's Alpha is as follows: (Abdul Rahman, 1998, 172).

In the current study, the reliability of the Executive Function Scale was calculated using Cronbach's Alpha based on data from the same group of fifth-grade pupils. The results are presented in the following table:

**Table:** Reliability of the Executive Function Scale using Cronbach's Alpha

Sample Size	Number of Items	Cronbach's Alpha
40	86	0.953

From the table, it is evident that the reliability coefficient, Cronbach's Alpha, is 0.953. This indicates that the Executive Function Scale is reliable.

## 5. Statistical Methods

After data collection, the collected data were subjected to actual analysis and processing using statistical methods that align with the study's methodology. Some of these methods include:

- 1. Mean:** It represents the average value calculated by summing a set of values and dividing it by the total number of values.
- 2. Standard Deviation:** It is the square root of the average squared deviations of individual values from their mean (Da'ilaj, 2014, 131).

Females		Females		Males		Males	
Score	Individuals	Score	Individuals	Score	Individuals	Score	Individuals
150	21	214	01	211	21	213	01
195	22	238	02	183	22	203	02
197	23	233	03	201	23	210	03
193	24	220	04	165	24	135	04
192	25	177	05	186	25	159	05
241	26	169	06	178	26	187	06
166	27	177	07	219	27	189	07
196	28	210	08	178	28	215	08
241	29	206	09	166	29	198	09
256	30	208	10	191	30	210	10
196	31	169	11	250	31	153	11
197	32	167	12	205	32	243	12
180	33	151	13	210	33	168	13
207	34	149	14	188	34	168	14
240	35	221	15	193	35	207	15
208	36	136	16	184	36	157	16
253	37	193	17	133	37	182	17

232	38		233	18		204	38		231	18
238	39		228	19		196	39		266	19
201	40		193	20		212	40		240	20
7001			Total		7619			Total		
175.025			Mean		190.475			Mean		

**3. T-test:** It is used to compare the means of two groups. Its purpose is to determine whether the difference between the means, obtained from two samples, is statistically significant or simply due to chance and sample selection. In other words, if the research is repeated multiple times, this difference will not appear again (Abu Nile, 1987, 231).

#### 4. Cronbach's Alpha Coefficient

##### 4.1 Presentation of Hypothesis One Results and Analysis

Hypothesis One in the current study states that there are statistically significant differences in executive functions among final-stage elementary pupils with reading difficulties, based on the teachers' perspective, attributed to the gender variable (males-females).

The following table presents the overall results of the pupils (males-females) obtained from the application of the Executive Function Scale based on the teachers' perspective.

**Table:** Presents the Results of (Males - Females) in the Executive Function Scale from the Teachers' Perspective

The table above illustrates the overall results for pupils (males - females) in the Executive Function Scale based on the teachers' perspective.

It is noted that the lowest score obtained in the Executive Function Scale for males is 133, obtained by individual number 37, which falls within the low level. On the other hand, individual number 19 obtained the highest score on this scale, which is 266, falling within the high level.

Similarly, the lowest score obtained in the Executive Function Scale for females is 136, obtained by individual number 16, which falls within the low level. Conversely, individual number 30 obtained the highest score on this scale, which is 256, falling within the high level. Based on the mentioned results, it is possible to classify the scores of the sample individuals (males-females) according to the levels of the Executive Function Scale as follows:

- Low level: From 86 to 143.
- Medium level: From 144 to 200.
- High level: From 201 to 266.

**Table:** Illustrates the Distribution of (Males - Females) Pupils' Results according to the Levels of the Executive Function Scale from the Teachers' Perspective

	Low Level	Medium Level	High Level	Total
<b>Males</b>	(%5) 2	(%50)20	(%45) 18	(%100) 40
<b>Females</b>	(%2.5) 1	(47.5%) 19	(50%) 20	(100%) 40
<b>Total</b>	<b>3</b>	<b>39</b>	<b>38</b>	<b>80</b>

To ensure the presence or absence of differences in the executive functions of fifth-grade pupils (males-females) with reading difficulties from the teachers' perspective, the following steps are taken:

**Table:** Results of the "t-test" for the Significance of Differences in Executive Functions from the Teachers' Perspective based on the (Males - Females) Variable

	N	M $\bar{H}$	A	"T"	D $\bar{H}$	M	Decision
Males	40	190.47	31.17	0.758	59	0.441	Not significant
Females	40	175.02	32.23				

Where:

- N: Represents the sample size
- M $\bar{H}$ : Represents the mean
- A: Represents the standard deviation
- "T": Represents the "t-test"
- D $\bar{H}$ : Represents the degrees of freedom
- M: Represents the level of significance
- Decision: Represents the decision made

From the above table, it is evident that the mean score of the male sample on the Executive Function Scale is 190.47, which falls within the medium level of executive functions (defined within the range of 144-200). Additionally, the standard deviation is 31.17, indicating that the scores are not widely dispersed around the mean.

No information is provided for the "t-test" and degrees of freedom for the female sample; hence no conclusion can be drawn regarding the significance of differences for females.

As evident from the previous table, the mean score for the female sample on the Executive Function Scale is 175.02, falling within the medium level of executive functions (defined within the range of 144-200). Additionally, the standard deviation is 32.23, indicating that the scores are not widely dispersed around the mean.

After calculating the "t-test" between the results of males and females from the teachers' perspective on the Executive Function Scale, the result is 0.758. Since the level of significance is 0.441, which is greater than 0.05, there are no significant differences in executive functions for fifth-grade pupils (males-females) from the teachers' perspective.

Thus, the results of the first hypothesis from the current study indicate no statistically significant differences in executive functions for final-stage elementary pupils with reading difficulties from the teachers' perspective attributed to the gender variable (males-females).

From the teachers' perspective, it can be interpreted that both males and females do not exhibit deficiencies in executive functions, as teachers assess their pupils primarily based on behavioural and instructional aspects in the classroom, aiming for good academic performance by the end of the year. This aligns with the study conducted by Ben Naamia Ouafa (2012) titled "Inattention, Hyperactivity, and their Relation to Reading Difficulties," which aims to investigate inattention and hyperactivity and their relation to reading difficulties. The study found no statistically significant differences in inattention and hyperactivity among fifth-grade pupils, as well as no statistically significant differences in inattention, hyperactivity, and reading difficulties based on gender.

**4.2 Presentation of the results of hypothesis 2, their analysis, and discussion**

Hypothesis 2 in the current study states that there are statistically significant differences in executive functions among final-stage elementary students with reading difficulties from the perspective of parents, attributed to the variable of gender (males - females). The overall results obtained by male and female students in the application of the executive functions scale from the parents' perspective are presented in the following table.

**Table:** Presents the results (males - females) in the executive functions scale from the perspective of parents.

<b>Females</b>		<b>Females</b>		<b>Males</b>		<b>Males</b>
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Score	Individuals	Score	Individuals	Score	Individuals	Score	Individuals
176	21	219	01	144	21	180	01
201	22	190	02	205	22	199	02
226	23	188	03	169	23	183	03
220	24	223	04	167	24	185	04
213	25	235	05	200	25	167	05
211	26	151	06	238	26	177	06
177	27	219	07	164	27	143	07
202	28	197	08	192	28	175	08
234	29	198	09	191	29	154	09
236	30	197	10	142	30	159	10
191	31	142	11	195	31	224	11
227	32	233	12	148	32	166	12
246	33	235	13	179	33	173	13
226	34	232	14	197	34	177	14
166	35	179	15	187	35	189	15
176	36	145	16	187	36	138	16
223	37	196	17	165	37	197	17
198	38	234	18	214	38	201	18
165	39	126	19	196	39	185	19
231	40	164	20	157	40	247	20
8048		<b>Total</b>		7256		<b>Total</b>	
201.2		<b>Mean</b>		181.4		<b>Mean</b>	

This table displays the overall results of the participants (males and females) in the executive functions scale from the perspective of parents.

The obtained results reveal that the lowest score achieved in the executive functions scale by males was 138, obtained by participant number 16, indicating a low level of executive functions. On the other hand, participant number 26 achieved the highest score of 238, indicating a high level of executive functions.

For females, the lowest score obtained on the executive functions scale was 142, achieved by participant number 11, indicating a low level of executive functions. Participant number 33 obtained the highest score of 246, indicating a high level of executive functions.

Based on these results, the scores of the sample participants (males and females) can be classified according to the levels of the executive functions scale as follows:

- ✓ **Low level:** Scores ranging from 86 to 143
- ✓ **Medium level:** Scores ranging from 144 to 200
- ✓ **High level:** Scores ranging from 201 to 258

**Table:** Distribution of Results for Male-Female Students According to Levels of Executive Functions Scale from the Perspective of Parents

	<b>Low Level</b>	<b>Medium Level</b>	<b>High Level</b>	<b>Total</b>
<b>Males</b>	4 (10%)	30 (75%) 6	6 (15%)	40 (100%)
<b>Females</b>	2 (5%)	18 (45%)	20 (50%)	40 (100%)
<b>Total</b>	6	48	26	80



The table illustrates the distribution of results for male and female students according to the levels of the executive functions scale from the perspective of parents. Among the male students, 10% obtained scores indicating a low level of executive functions, 75% achieved scores indicating a medium level, and 15% attained scores indicating a high level. Similarly, among the female students, 5% obtained scores indicating a low level, 45% achieved scores indicating a medium level, and 50% attained scores indicating a high level. Thus, all participants in the sample can be classified into three levels: low, medium, and high.

However, the results of the female participants on the executive functions scale differ. Among the female sample, 5% obtained scores indicating a low level of executive functions, while 45% achieved scores indicating a medium level, and the majority of them (50%) attained scores indicating a high level.

To confirm the presence or absence of differences in the executive functions of fifth-grade students with reading difficulties from the perspective of parents, the following steps are taken:

**Table:** Presents the results of the "t-test" for the significance of differences in executive functions from the perspective of parents based on the variable (males - females)

	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>t</b>	<b>df</b>	<b>p-value</b>	<b>Decision</b>
<b>Males</b>	40	181.40	31.15	-3.420	58	0.424	Not significant
<b>Females</b>	40	201.20	32.12				

Where:

N: Represents the sample size

Mean: Represents the arithmetic mean

SD: Represents the standard deviation

t: Represents the t-test statistic

df: Represents the degrees of freedom

p-value: Represents the probability value

Decision: Indicates the decision based on the p-value

In this table, the t-test was conducted to examine the significance of differences in executive functions between males and females from the perspective of parents. The results showed that the t-value was 3.420- with a p-value of 0.424, indicating that there is no significant difference in executive functions between males and females.

The previous table shows that the mean score for males in the sample on the executive functions scale is 181.40, which falls within the medium level and is very close to the high level of executive functions (defined in the range of 144-200). The standard deviation for males is 31.15, indicating that the scores are not widely dispersed around the mean.

Similarly, the table indicates that the mean score for females in the sample on the executive functions scale is 201.2, which falls within the high level of executive functions (defined in the range of 201-258). The standard deviation for females is 32.12, indicating that the scores are not widely dispersed around the mean.

After conducting the t-test between the results of males and females from the perspective of parents on the executive functions scale, the t-value was calculated as 3.420-, and since the significance level is 0.001, which is smaller than 0.01, there are significant differences in the executive functions of fifth-grade students (males - females) according to parents' perspective.

The second hypothesis in the current study, which states that there are statistically significant differences in executive functions among primary school students with reading difficulties from the perspective of parents, attributed to the gender variable (males-females), has been confirmed. This means that there are differences in executive functions between males and females according to parents' perspective. Males have a lower percentage compared to females in executive functions, and this deficiency in executive functions may be attributed to visual, auditory, or linguistic impairments, such as visual and auditory

perception deficits, auditory and visual closure difficulties, and discrimination between shape and background. These impairments may manifest as word recognition errors, reading habits, comprehension difficulties, and symptoms of inattention. They can also result from social upbringing methods.

The difference between males and females (males-females) could be due to the dominance of one hemisphere of the brain, or it could be related to intelligence. On the other hand, it may be influenced by parents' lack of involvement in their children's academic progress. Females differ from males in terms of their interest in lessons, completion of homework, class participation, and discipline. It is crucial for parents to pay attention to their children in all areas, especially education, in order for students to overcome any difficulties they may encounter. This contributes to their psychological harmony, self-concept, and self-esteem. These findings align with a study conducted by Ben Hbiri Azeddine in 2011, titled "Study of Some Cognitive Processes (Attention, Perception, Memory) in Students with Academic Learning Difficulties (Reading Disability as a Model)." The study aimed to explore the nature and characteristics of some primary cognitive processes (attention, perception, memory) in students with reading difficulties, in relation to reading disabilities, using specific tests to measure these processes. The study concluded that individuals with reading difficulties do not have impaired visual perception function. Instead, they experience difficulties in visual memory function and continuous attention function.

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