

Brain Control and Its Relationship to Reading Difficulties Among Primary School Students

Dr. Diao Fadel Abbas¹

Dr. Zaid Sami Yasser²

^{1, 2} Ministry of Education/ Najaf Education Directorate/ Iraq.

Abstract

The study aimed to investigate brain control and its relationship to reading difficulties among lower-grade primary school students in selected government schools in Al-Haydariya District, from the perspective of specialized teachers. The study was conducted on a stratified random sample of 15 primary schools in Al-Haydariya District. To achieve the study's objectives, the researchers developed a questionnaire to explore the economic, social, and cognitive aspects related to the specific programming of brain control and its role in controlling reading difficulty or ease. The validity and reliability of the questionnaire were confirmed after it was subjected to expert evaluation. Data were analyzed using the Statistical Package for the Social Sciences (SPSS).

The results revealed a strong relationship between brain control and reading difficulties, with significant statistical differences in the average responses of the sample, attributed to economic and social variables as perceived by physical education teachers.

Keywords: Brain Control, Reading Difficulties and Dyslexia.

1-Introduction

Learning difficulties represent a modern area of investigation for psychologists across various educational, cognitive, and neurological disciplines. Neurologists have also addressed these difficulties due to their association with cortical brain functions. Researchers have utilized various advanced tests and medical imaging technologies, focusing on reading difficulties as a specific area of interest within learning difficulties.

Reading difficulties have been linked to neurological and anatomical or functional factors, as many researchers have posited. The cerebral cortex, being the center of higher mental processes, is sensitive to functional disturbances or structural abnormalities, which may affect the acquisition process and interactions with internal and external environments. These include sensory input and information processing.¹

Several studies have indicated that cognitive disorders, such as difficulties with attention, perception, and thinking, are among the causes of reading difficulties. The acquisition of skills is a complex process reliant on the development of diverse cognitive and thinking skills. Visual perception, for instance, is a crucial cognitive process

involving the preparation and processing of visual inputs to understand the surrounding world and the relationships between its components. Visual inputs such as lines and shapes represent symbols connected to mental capabilities.²

Deficiencies in developing this cognitive ability (visual perception) significantly impact acquiring daily life and educational concepts correctly. Neurologists and neuropsychologists suggest that individuals often rely on one hemisphere of the brain more than the other when processing information and performing certain functions, such as movement, language, and perception. This preference has given rise to the term "brain control," which encompasses three main types: right-brain dominant, left-brain dominant, and balanced (or integrated).

1-1 Problem Statement

Neuropsychologists and cognitive psychologists propose that an individual's life is shaped by two interconnected realms: the physical world governed by natural laws such as gravity and electricity, and the cognitive world, encompassing processes like perception, attention, and thinking, governed by its unique laws.

Studying cognitive issues involves examining the relationship between these two realms—human physiology and the cognitive processes it supports. This study aims to explore the interplay between the brain and cognitive processes, particularly visual perception, among students with reading difficulties.

Based on previous research, reading difficulties related to letters and their shapes might be linked to neurological dysfunction in brain control. For instance, left-brain dominant individuals may experience different types of reading difficulties than right-brain dominant individuals due to variations in thought and perception pathways.

Furthermore, visual perception disorders, as a cognitive ability, may be associated with neurological structural abnormalities or functional brain disturbances.

The following questions arise:

1. Can reliance on one hemisphere of the brain, whether left or right, be associated with visual perception disorders among students with reading difficulties?

2. Is there a relationship between brain control and verbal perception disorders in such cases?

1-2 Study Objectives

- The study aims to determine whether visual perception disorders are related to brain control, specifically the hemisphere predominantly relied upon (right or left) in cases of reading difficulties.
- To address a common educational phenomenon, namely reading difficulties, from a neuropsychological perspective, providing a deeper and broader understanding of its causes and manifestations.

1-3 Research Hypotheses

There is a correlational relationship between brain control and reading difficulties among lower-grade primary school students (grades 1, 2, and 3).

1-4 Research Scope

- **Human Scope:** Lower-grade primary school students (grades 1, 2, and 3).
- **Temporal Scope:** From October 22, 2023, to March 20, 2024.
- **Spatial Scope:** Selected primary schools in Al-Haydariya.

3. Research Methodology and Field Procedures

3.1 Research Methodology

The researcher adopted the descriptive method using a survey approach, which is suitable for the nature of the problem. The survey approach aims to collect data from individuals and communities to identify the current state of a specific variable or variables.

3.2 Research Population and Sample

The research population consisted of selected primary schools in Al-Haydariya, Najaf Governorate, for the academic year 2023–2024, totaling 15 schools. The sample was extracted randomly.

3.3 Field Research Procedures

3.3.1 Research Tool

The research tool was a questionnaire designed following these steps:

1. The researcher prepared a questionnaire form after reviewing literature and studies related to the research topic. This helped select several items related to brain control and reading difficulties in some primary schools in Al-Haydariya.
2. A pilot study was conducted by directing open-ended questions to a sample of primary school teachers in Al-Haydariya schools. Responses were collected from five schools (Appendix 1). Based on the results of the above two steps.

The questionnaire included three fields addressing brain control and reading difficulties in selected primary schools in Al-Haydariya:

1. Social aspects.
2. Economic aspects.
3. Cognitive aspects.

Five options were provided for each item, based on a Likert scale (Excellent, Good, Suitable, Poor, Very Poor), with weights assigned as follows: 1, 2, 3, 4, and 5, respectively. Table 1 outlines the number of questionnaire items for each field in its final form.

Table 1. Shows the Number of Items for Each Domain in the Final Questionnaire Format

Sequence	Domains	Number of Items
1	Economic Domain	13
2	Social Domain	22
3	Mental Domain	25
Total		60

3-4 Scientific Basis

3-4-1 Tool Validity:

Tool or test validity refers to whether the instrument, in its overall content and items, measures what it is intended to measure, ensuring that the items are relevant to the intended evaluation. In this study, the validity of the tool was confirmed through face validity. Instructions were added to the questionnaire, and it was presented to a group of (8) experts and specialists.

After collecting and analyzing the data, the researcher employed the Chi-square (χ^2) test to determine the validity of the items. Results showed that all items were valid since the calculated χ^2 values for these domains were smaller than the tabular value (3.83) at a degree of freedom (1) and a significance level (0.05). Therefore, all items of the questionnaire were accepted, which is evidence of the tool's face validity.³

The intrinsic validity was also calculated based on the logical relationship between the validity and reliability of the test. Since every valid test is necessarily reliable, the intrinsic validity of the questionnaire for Al-Haidariya teachers was found to be (0.96).

3-4-2 Reliability:

Test reliability refers to the consistency of the test results when repeated under the same conditions on the same group. To confirm the reliability of the questionnaires used in this study, a sample of (4) teachers from Al-Haidariya schools, outside the main research sample, was selected.⁴ The split-half method was applied by dividing the questionnaire into two halves: odd-numbered items in one half and even-numbered items in the other. Pearson's correlation coefficient was calculated between the scores of the two halves, yielding a value of (0.84) for Al-Haidariya teachers.

Using the Spearman-Brown correction formula, the correlation coefficient increased to (0.91). The overall shared variance was (0.84). Typically, a reliability coefficient greater than (0.70) and shared variance higher than (0.50) are preferred. Thus, the split-half reliability method demonstrated a relatively high reliability for the questionnaire.⁵

Additionally, the researcher used the Cronbach's Alpha coefficient to measure internal consistency. This concept examines the correlation between each item and every other item in the tool. Cronbach's Alpha represents the average of the reliability

coefficients resulting from splitting the test into different parts. Table (2) displays the reliability coefficients for the questionnaire using this method. It is generally agreed that the Alpha value should be equal to or greater than (0.70) for suitability.

Table 2. Show reliability Coefficient Using Cronbach's Alpha Method

Sample	Number	Number of Items	Alpha Coefficient	Shared Variance
Al-Haidariya Schools	4	80	0.82	0.67

The calculated reliability coefficients using both methods are reassuring, as the shared variance ranged between (0.67 – 0.82), as indicated by Ferguson & Takane. With the completion of validity and reliability calculations, the questionnaire became ready for application to the research sample.

3-5 Main Experiment:

After ensuring the appropriate conditions for conducting the test, the researcher distributed the questionnaire forms to the research sample, consisting of (15 elementary schools). Respondents were asked to mark the appropriate answer for each item. All distributed forms were retrieved for statistical analysis.

3-6 Information and Data Collection Methods:

- Arabic and foreign references.
- Questionnaire form.

3-7 Statistical Methods:

The SPSS software package was used to extract the statistical methods applied in this research.

4- Results and Discussion

To achieve the main goal of the research, which focuses on understanding the relationship between cognitive control and reading difficulties in the early grades of some primary schools in Al-Haidariya, the study aims to assess the teachers' awareness

of the general concept of cognitive control and reading difficulties, as well as to gather the views of teachers and supervisors regarding reading difficulties to accomplish these tasks.

4-1 First Area: The Economic Field

Table 3. Show that this field contains 13 items, with an overall weighted average of (3) and a percentage weight of (63.4).

Item	Weighted Average	Percentage Weight
1	Are you unable to go to school because of the distance?	3.2
2	Do you have internet services at home to communicate with the school?	3.2
3	Do you have sufficient income to continue education?	3.1
4	Do you have enough school supplies?	3.1
5	Do you have a house that provides you with the privacy to study?	3.1
6	Are the school expenses adequate for learning?	3
7	Does your guardian have a stable income or is it fluctuating?	3
8	Do you have an employed family member?	3
9	How many employed family members do you have?	3
10	Is your house owned or rented?	3
11	How far is your home from the school?	3
12	Do you use transportation to get to school?	2.9
13	Do you have a school bus?	2.8
Overall Average	3	61.5

The table shows that the highest ranks are related to items (1, 2, 3, 4), with weighted averages of (3.2 and 3.3) and percentage weights of (64.3 and 63). These results are attributed to the fact that most teachers and supervisors consider the economic aspect to be of great importance in contributing to the success of the educational process, as well as encouraging and motivating students to learn. This is particularly helpful in avoiding reading difficulties unless there are genetic factors, which will be addressed later.⁶ Furthermore, teachers confirmed that they recognize that the economic situation increases student attendance and engagement in lessons due to early school arrival, which helps teachers monitor students.⁷

4-2 Second Area: The Social Field

Table 4. Show that this field includes eleven items, with an overall weighted average of (3) and a percentage weight of (61.3).

Rank	Item Number	Item Description	Weighted Average	Percentage Weight
14	21	You live happily in your home	3.3	67.3
15	20	You have brothers and sisters who love you	3.3	65
16	23	Your father loves you specifically	3.2	64.3
17	26	Does your father have one wife or more?	3.2	64.2
18	29	Your father treats you equally with your siblings	3.1	64.1
19	30	Who among you studies at the university?	3.1	63.6
20	22	Your father is employed	3	62.6
21	28	Does your mother work?	3	62.6
22	24	Do your parents live together?	2.9	61.6
23	27	Does the separation of your parents affect you?	2.9	61.5
24	25	Does the school motivate you to learn?	2.9	60.6
25	21	Your feeling towards the teacher is fatherly	2.9	58.3
26	20	You like to have a teacher close to you	2.9	58
27	23	Communication with parents is important	2.8	57.3
28	26	Your guardian follows up on your school performance	2.8	56.6
29	29	Frequent events lead to school absenteeism	2.8	54.6
30	30	You use more than one communication method to kill time	2.8	54.6
31	22	Moving from one place to another affects learning easily	2.8	53.6
32	28	You work freely on your farm	2.7	52.6
33	24	Is your residence permanent or seasonal?	2.7	51.6
34	27	The teacher brings joy to you when you come to school	2.7	51

35	25	You like to communicate with people a lot	2.7	51
Overall Average	3.3	60.1		

The highest ranks were attributed to items (21, 20, 23), with weighted averages ranging between (3.2 – 3.3) and percentage weights ranging between (64.3 – 67.3). These items indicate that the student's happiness living with both parents, the father having one wife, and the students' positive perception of their family environment enhance their morale and improve their social condition.⁸

These results show that achieving social communication in schools contributes to delivering a clear, understandable, and complete message to its recipient, which in turn helps parents to understand and accept the issues.⁹ Creating an atmosphere of trust and understanding among the educational staff fosters cooperation, trust, and morale. Teachers' attention to following up on students' performance and their problems by various means is crucial in improving the educational level in primary schools.¹⁰ This ultimately leads to enhancing the teachers' performance, especially in the first-grade levels (first, second, and third grades).¹¹

The last ranks were for items (24, 27, 25), with weighted averages ranging between (2.8 – 2.9) and percentage weights between (52 – 52.3). These items focused on issues such as whether the residence is permanent or seasonal and whether the students like to communicate with people a lot.¹² These aspects weaken the effectiveness of the learning process, negatively affecting students' performance. The lack of consistency in the students' environment, as seen in agricultural areas, contributes to incomplete homework assignments, as observed by the researcher.^{13,14}

5- Conclusions and Recommendations

5-1 Conclusions

1. Teachers face difficulties in delivering information during the communication process with students due to mind wandering, distraction, and hyperactivity, which results in cases of reading difficulties or dyslexia.

2. The lack of modern teaching methods and technologies in schools leads to slow and ineffective learning, contributing to cases of reading difficulties.
3. Teachers show interest in monitoring students' performance and addressing their issues through various means, which positively impacts the educational level of students, subsequently improving the functions and duties of schools.
4. The lack of necessary financial resources to provide modern equipment for primary schools, and the teachers' insufficient skills in using these devices, hinders the educational process.
5. Successful learning requires the recipient to understand the content of the message.

5-2 Recommendations

1. Focus on developing lessons in terms of modernity and entertainment, making them more enjoyable for students.
2. Equip schools with advanced technology and educational tools.
3. Direct administrative efforts at the school and directorate levels to serve students with learning difficulties.
4. Build a system within the directorate to collect data, create programs, and offer solutions to address learning difficulties.
5. Direct supervisors and principals to understand the nature of reading difficulties and refrain from blaming teachers for not completing the curriculum, due to the need to repeat lessons or placing affected students in specialized classes to ensure the educational process follows the prescribed curriculum.

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