

The nature of the cognitive contexts that affect the reading process for children with reading difficulties

طبيعة السياقات المعرفية المتدخلة في عملية القراءة لدى الطفل المصاب بصعوبات تعلم القراءة

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Abstract:

This study aims at finding out the cognitive contexts that intervene in the procession of written information by children who suffer reading difficulties, compared to the normal children, and any differences between the two groups regarding these contexts. The sample includes 40 children of 09-11 years, 20 with reading difficulties and 20 are normal. In so doing, we used (Jeannot & George) test for reading, Weschler Intelligence Scale for Children WISC test, and written word recognition test. Besides, we made statistical analysis to figure out the statistical significance of the differences between the two groups. Findings show differences in the cognitive contexts that affect reading by children who suffer reading difficulties, compared to the normal children.

Keywords: cognitive contexts; reading; reading difficulties.

ملخص :

تهدف الدراسة الحالية إلى محاولة التعرف على طبيعة السياقات المعرفية المتدخلة في عملية معالجة المعلومات الكتابية عند الطفل الذي يعاني من صعوبات تعلم القراءة من الناحية المعرفية، مقارنة مع الطفل العادي، وتحديد ما إذا كان هناك فرق في مستوى هذه السياقات المعرفية المسؤولة عن اكتساب القراءة بين الأطفال الذين يعانون من صعوبات تعلم القراءة والقراء العاديين، وقد تألفت عينة البحث الحالي من 40 طفلا ، 20 طفلا عاديا و 20 الباقية أطفالا يعانون من صعوبات في القراءة ، تتراوح أعمارهم ما بين 9 و 11 سنة ، تم تطبيق اختبار القراءة لـ (jeannot+ George) ، اختبار الذكاء (Wisc) و اختبار التعرف على الكلمات المكتوبة اختبار (Mim) ، كما تم إجراء التناول الإحصائي من أجل إعطاء دلالة إحصائية للفروق الموجودة بين مجموعتي البحث. وقد أظهرت نتائج هذه الدراسة، أنه توجد فروق في مستوى السياقات المعرفية المسؤولة عن القراءة بين الأطفال الذين يعانون من صعوبات في تعلم القراءة و الأطفال العاديين .

الكلمات المفتاحية: السياقات المعرفية؛ القراءة؛ صعوبات القراءة.

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Introduction

Currently, reading has gained much importance thanks to its role in the academic success, and in learning in general. It is a complicated cognitive process that covers the processions at different levels, starting from the recognition of graphemes (letters) until reaching meaning. In this process, audiovisual, motor, and mental mechanisms intervene to decode the written symbols and understand meaning (Khairi, n.d.). The psycho-pedagogy studies focused on the identification and interpretation of the different cognitive abilities that take part in the process of recognizing the written words during reading, and introduced cognitive models that interpret the sequenced process (Saaidoune, 2003) and identify the different phases and contexts the cognitive mechanisms go through in reading until reaching a mature cognitive structure.

In the start of learning reading, the child has many structural elements to use in processing the information, namely:

- A set of vocabularies.
- An image of these vocabularies in his memory.
- A semantic map that details the information he developed on the meanings of, and relations between, the vocabularies.

In addition, the child has lower mental abilities that help make semantic and grammatical analyses to understand and produce oral sentences. In this regard, the lack or delayed development of these systems hinders reading because its acquisition relies on the development of the functional contexts and structures of learning the written language; in other words, it is acquiring mechanisms that allow linking the transcription to a suitable verbal form (Bonnet et al., 1999).

Reading is a learning medium, and the inability to understand a written text brings about reading difficulties because reading is a set of contexts that allow the extraction of the written text through recognition and comprehension of words (Splenger & Casalis, 1996). The ability to read is achieved thanks to the interaction between different contexts that are subject to scholars' analysis. Therefore, and based on the status-quo of schools, we find a group of children who suffer in acquiring the ability to read. Based on what was said, we shall focus on the nature of the cognitive contexts that affect the procession of the written information by children who suffer reading difficulties compared to the normal children. Most of the studies in this field are limited to the superficial description of the reading difficulties and do not achieve a deep understanding and treatment of this trouble. In addition, the results of the foreign studies are

not applicable to our societies because of the differences in languages and methods of learning.

1. Problematic:

Reading is one of the higher mental abilities, the first basis for the other leaning processes, and a necessary tool to exercise the other life activities. It is a complicated process that requires different sub-skills used in exact and organized mechanical contexts. It needs high abilities and skills, and is based on recognizing words because it needs mental and motor processes, and is not merely seeing shapes (letters and words). Thus, studies tell that reading needs two processes; the first allows recognizing the written words while the second is about comprehension. The troubles in these mechanisms negatively affect reading, as the child cannot decode and recognize the symbols (Estienne, 1998).

The psycho-linguistic and psycho-cognitive studies shed light on reading and its difficulties to understand the cognitive contexts and mechanisms that allow the good extraction of the written message. Such studies include that of Frith (1985) (Perfetti, 1995) who introduced the developmental model of language acquisition, which suggests three contexts for reading:

- The logographic process: This context includes the direct visual procession of words.
- The alphabetical process: It is about redecoding the symbols, as the child makes a phonological procession to get sounds. This context needs knowledge about the letters sequenced to form the speech we hear. Thus, it needs the transformation of symbols into letters, the phonological decoding, and the recognition of the written words.
- The orthographic process: It is characterized with a wide linguistic wealth and ability to assemble based on a developed system. The knowledge here is direct without the phonological process rules.

According to Frith, the basic cognitive contexts to acquire reading develop during the process of learning. However, some learners suffer difficulties in learning reading at a late age. Therefore, we find ourselves obliged to raise this question, “are there differences between children with reading difficulties and the normal ones regarding the cognitive contexts that help reading acquisition?”.

2. Hypotheses:

2.1 The main hypothesis:

- There are differences between children with reading difficulties and the normal ones regarding the cognitive contexts that help reading acquisition.

2.2 Sub-hypotheses:

- There are differences between children with reading difficulties and the normal ones regarding the logographical process.
- There are differences between children with reading difficulties and the normal ones regarding the alphabetical process.
- There are differences between children with reading difficulties and the normal ones regarding the orthographic process.

3. Aims of the study:

This study aims at identifying the nature of the cognitive contexts that take part in the procession of the written information by children with reading difficulties compared to the normal children, and at finding the weaknesses that face school children in reading.

4. Importance of the study:

- Identifying the process of reading and its difficulties, and distinguishing it from the rest of difficulties.
- Knowing the causes and factors that degraded teaching reading.
- Equipping the teachers with information on the question to facilitate the detection and diagnosis.

5. The study terms:

5.1 The concept of the cognitive contexts:

According to Frith, reading goes through three contexts, namely the logographical, the alphabetical, and the orthographic processes. Each needs a strategy to process the written words.

5.1.1. The logographic process:

It is the pre-reading context, which allows the child to recognize a limited number of words (around 1000 words) that he had seen and recognized based on visual characteristics. The child has a general and approximate view of the words and does not know their parts (letters and syllables) (Content, 1996).

5.1.2. The alphabetical process:

It allows the recognition of words based on the relations between the letters and sounds. This allows the child to read some pseudo words based on the divisions. Here, the mistakes are phonological, not visual as in the 1st context. This context relies on learning the relation between the letters and sounds, and the ability to know the voiced and silent letters and divide and assemble the syllables.

5.1.3. The orthographic process:

Here, the syllables and morphemes of the written words are recognized. The child who uses this context can identify in a word a syllable that is found in other words. Besides, it allows the child who masters the 2nd process to store and rewrite the words. In this context, we have two methods of word recognition. The 1st is about recognizing the relation between the letter and the sound. The words are divided into small units that are assembled. The 2nd method is about recognizing the word as a fixed form without assembly, because we directly go to the word stored in the orthographic lexicon.

5.2 The concept of reading:

It is the process of uniting written or drawn paintings, letters, or any symbols using the eyes, establishing connections between the written and the pronounced, and uttering the written.

5.3 The reading difficulties:

This concept is part of the developmental learning difficulties, which are defined as the permanent difficulties in learning reading and acquiring its skills. These difficulties are found in school children with normal intelligence and no impairments, and affect writing learning (Borel, 1999). In addition, Khairi al Maghazi Adjaj confirms that such difficulties manifest in school children, and result in:

- Difficulties in reading.
- Difficulties in writing.
- Difficulties in spelling and written expression.
- Difficulties in calculation.
- Difficulties in listening comprehension (Debray & Ritzen, 1981).

6. The procedures of the applied study:

6.1 Method of the study:

We used the comparative descriptive method because it allows interpreting and analyzing the phenomena with similar definitions, and identifying the similarities and differences to reach satisfying results and a scientific truth. Besides, it allows studying the sample and finding out more about its sides, characteristics, and exceptions (Mohamed Salah Dine, 2010, p. 38).

6.2 The study limitations:

The temporal limitations:

The field study took place from April to May 2024.

The spatial limitations:

The study took place in 03 primary schools in Algiers, namely Ben Amor al Jadida in Kouba, al Jahed 01 in Sidi Mhamed, and al Jahed 02 in Sidi Mhamed. It covered the 04th grade learners.

6.3 Sample of the study:

We chose the informants on purpose and made sure the two study groups are equivalent on all the levels, except in the reading difficulties. The informants are 04th grade students at the primary school and receive the same educational program. The sample includes 40 children; 20 are normal and 20 suffer reading difficulties. The informants of the 1st group received some reading sessions and proved they master reading and pronounce the letters correctly. In addition, we asked the teacher to provide us with their reading marks of the 1st and 2nd terms, and found out results between 08 and 10. As for the children of the 2nd group, most got held back. Therefore, we conducted speech and psychological tests and took their parents remarks into account. Besides, we made sure they show no motor-sensor, nervous, psychological, or personal troubles. The tests showed that they suffer big difficulties and confusion in reading letters, what negatively affects their academic achievement. The following lines show the characteristics of the informants:

Table 01: The distribution of the sample according to gender, age, and grade

Criteria	Normal children		Children with reading difficulties	
Gender	Males	Females	Males	Females
	10	10	10	10
Age	09-10		09-10	
Grade	04 th grade		04 th grade	
Reading and dictation level	Good		Low	

6.4 The study tools:

6.4.1. The 1st procedural analysis:

It includes the tests of regulating the variables and their results.

First: Introduction of the tests:

1. Jeanot George test:

It includes 02 texts designed by some scholars (Chassaguy, 1962). It was adapted by Saaidoune Souheila to the Algerian context in 2003, with students of the 04th grade at the primary school. Besides, its psychometric properties were examined. It targets the Algerian socio-cultural school context and aims at

diagnosing the reading difficulties, getting an objective reference, and identifying the level of the students of 1st and 2nd cycles of the primary school in reading Arabic (either normal or bad readers).

The first text includes 52 words while the 2nd includes 81 words. Each text is written in a clear way to facilitate reading. Then, we count the mistakes of each student with reading difficulties. The mistakes are divided into:

- Visual confusion of similar letters regarding shape and sound.
- Acoustic confusion of voiceless and voiced sounds.
- Omission of some syllables.
- Addition of letters.
- Change of letters' places.
- Confusion of similar words.

2. WISC test:

It is an individual intelligence test developed by David & Kessler to test the intelligence of 06 to 16 years old children. It takes from 45 to 65 minutes and provides 05 main indices, namely the verbal comprehension index, the visual spatial index, the fluid reasoning index, the working memory index, and the processing speed index. It aims at diagnosing the differences in intelligence and has a verbal item and an item about competency. Its results show the general age, the verbal age, and the competency age. The verbal item is divided into 06 subsets used in calculating the partial age. However, the competency item (the non-verbal) is what we used in our study to diagnose children with reading difficulties.

6.4.2 The 2nd procedural analysis:

First/ Introduction of the test:

1. The written words recognition test:

It is about reading a set of words, and is inspired from “Test MIM de la batterie Belec Batterie d'évaluation (MIM) du langage écrits et ses troubles , Mousty,p ,Leybaert,j , Alegria,j, content Morais 1994”. It includes pseudo, frequent, and rare words. Each category includes short and long words. Belec Battery allows examining the difficulties in reading and writing and in recognizing the written words, and is the outcome of studies conducted by Mousty,p,Leybaert,Alegriato facilitate the diagnosis of troubles in children between 07 and 12 years old.

7. The statistical analysis:

The data analysis covers the statistical structure of a set of variables through the statistical units or views (outputs), and aims at revealing the relations between the statistical variables. In this study, we made the statistical procession using “t” test to compare two experimental means and confirm whether the difference between the two groups is fixed and has a significance, is a random result, or is due to the test conditions. This is “t” test in case we have equal groups:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{S_1^2 + S_2^2}} \cdot \sqrt{n}$$

8. Presentation and analysis of the study results:

8.1 The results of the 1st procedural analysis:

Table 02: The results of the reading test for group 01

Case	Mistake	Duration (seconds)
Case 1	/	210
Case 2	/	290
Case 3	/	239
Case 4	/	242
Case 5	/	250
Case 6	/	270
Case 7	/	220
Case 8	/	280
Case 9	/	285
Case 10	/	210
Case 11	/	270
Case 12	/	250
Case 13	/	230
Case 14	/	220
Case 15	/	290
Case 16	/	210
Case 17	/	230
Case 18	/	285
Case 19	/	270
Case 20	/	230

Table 03: The results of WISC test for group 01

Case	Intelligence scale
Case 1	%90
Case 2	%90
Case 3	%90
Case 4	%90
Case 5	%90
Case 6	%90
Case 7	%90
Case 8	%90
Case 9	%90
Case 10	%90
Case 11	%90
Case 12	%90
Case 13	%90
Case 14	%90
Case 15	%90
Case 16	%90
Case 17	%90
Case 18	%90
Case 19	%90
Case 20	%90

Table 04: The results of the reading test for group 02

Case	Mistake	Duration (seconds)
Case 1	11	470
Case 2	27	520
Case 3	17	430
Case 4	129	465
Case 5	10	280
Case 6	22	500
Case 7	15	230
Case 8	25	590
Case 9	30	670
Case 10	52	510

Case 11	45	390
Case 12	65	520
Case 13	79	650
Case 14	32	610
Case 15	80	790
Case 16	53	470
Case 17	60	800
Case 18	78	830
Case 19	36	540
Case 20	50	399

Table 05: The results of WISC test for group 02

Case	Intelligence scale
Case 1	%90
Case 2	%90
Case 3	%90
Case 4	%90
Case 5	%90
Case 6	%90
Case 7	%90
Case 8	%90
Case 9	%90
Case 10	%90
Case 11	%90
Case 12	%90
Case 13	%90
Case 14	%90
Case 15	%90
Case 16	%90
Case 17	%90
Case 18	%90
Case 19	%90
Case 20	%90

8.1.1 Analysis of the 1st procedural treatment:

This treatment allowed diagnosing the control and experimental groups. We made sure the informants in both groups have normal intelligence and suffer no other troubles. Findings showed a big difference between the two groups in reading, as the children of the experimental group took two times the time needed by the children of the control group. In addition, we noticed differences in the quality of reading, as the normal children made a clear and fluent reading, as expected from a student at the 04th grade of the primary school, and as confirmed by teachers and pedagogues. However, those in the experimental group showed a slow intermittent reading with many mistakes and much confusion; thus, the reading was not understood. Besides, they showed inability to link and order the letters in reading the words, and some did not manage to read some words while others zapped lines or even paragraphs. In addition, most of the mistakes were about changing letters; therefore, we could not understand their readings.

8.2 The results of the 2nd procedural analysis:

Table 06: The results of the test of recognizing the written words for group 01

Case	Frequent words (logographic process)	Pseudo words (alphabetical process)	Rare words (orthographic process)
Case 1	48	24	48
Case 2	48	24	48
Case 3	48	24	48
Case 4	48	24	48
Case 5	48	24	48
Case 6	48	24	48
Case 7	48	24	48
Case 8	48	24	48
Case 9	48	24	48
Case 10	48	24	48
Case 11	48	24	48
Case 12	48	24	48
Case 13	48	24	48
Case 14	48	24	48
Case 15	48	24	48

Case 16	48	24	48
Case 17	48	24	48
Case 18	48	24	48
Case 19	48	24	48
Case 20	48	24	48

Table 07: The results of the test of recognizing the written words for group 01 according to the arithmetic mean, standard deviation, maximum value, minimum value, and percentage of success

Case	Frequent words (logographic process)	Pseudo words (alphabetical process)	Rare words (orthographic process)
Arithmetic mean	48	24	48
Standard deviation	0	0	0
Max	48	24	48
Min	48	24	48
Percentage%	100	100	100

Table 08: The results of the test of recognizing the written words for group 02

Case	Frequent words (logographic process)	Pseudo words (alphabetical process)	Rare words (orthographic process)
Case 1	43	5	20
Case 2	41	5	19
Case 3	42	7	22
Case 4	42	3	23
Case 5	46	7	23
Case 6	44	5	18
Case 7	45	4	21
Case 8	44	2	20
Case 9	43	4	20
Case 10	43	5	18
Case 11	48	3	16
Case 12	40	4	20

Case 13	41	6	21
Case 14	40	4	22
Case 15	41	2	16
Case 16	42	4	19
Case 17	44	4	17
Case 18	40	5	23
Case 19	41	4	18
Case 20	46	3	21

Table 09: The results of the test of recognizing the written words for group 02 according to the arithmetic mean, standard deviation, maximum value, minimum value, and percentage of success)

Case	Frequent words (logographic process)	Pseudo words (alphabetical process)	Rare words (orthographic process)
arithmetic mean	42,75	4,3	19,85
standard deviation	2,02	1,27	2,31
Max	46	7	23
Min	40	2	16
Percentage%	89,06	17,91	41,35

8.2.1 Analysis of the 2nd procedural treatment:

Findings show the good and correct use of the processes to recognize words during reading for the control group, as the children managed to recognize all the written words by the letter-sound correspondence and phonological blending. In this regard, the letter-sound correspondence relies on the direct treatment of the visual information in recognizing the familiar words using the logographic process, while the phonological blending is used by the child in the alphabetical process to recognize the pseudo words. As for the orthographic process, it allows children to recognize the rare words using the orthographic representations.

Regarding the experimental group, all the informants failed in using the processes of recognizing the written words, as they did not recognize all the familiar words, proving their inability to use the logographic process. In addition, we made sure of the low rate in recognizing the pseudo words because the children with reading difficulties did not master the alphabetical context, which is basic in acquiring reading. In this context, these children rely on the written form of words when recognizing them. However, this does not allow

reading the pseudo words and leads to deficits in the phonological blending and in linking the sounds with the letters. Thus, not all children who recognized the pseudo words can read the rare words. This is proven by the low rate that explains that the orthographic context relies on the direct visual recognition in reading the familiar words. However, this is applicable to the phonological blending for the rare words, as we witnessed a big failure in each context separately. The child who suffers reading difficulties relies on the written representation to read words. Therefore, he finds difficulties in recognizing the pseudo and rare words. Besides, the inability to master the alphabetical process leads to difficulties in mastering the logographic and orthographic processes, showing the relation between these processes.

9.3 Presentation and analysis of the statistical analysis:

9.3.1 Study of the differences between the two groups regarding the logographic process:

After calculating t, we found out that:

Table t	Calculated t	Degree of freedom	Significance level
3.37	-16.40	78	0.001

The table shows that “t” is -16.40 at significance level 0.001, indicating statistically significant differences between the two groups. In this regard, the children of group 01 master the logographic processes unlike the children of group 02.

9.3.2 Study of the differences between the two groups regarding the alphabetical process:

After calculating t, we found out that:

Table t	Calculated t	Degree of freedom	Significance level
3.37	-131.33	78	0.001

The table shows that “t” is -131.33 at significance level 0.001, indicating statistically significant differences between the two groups. In this regard, the children of group 01 master the alphabetical processes unlike the children of group 02.

9.3.3 Study of the differences between the two groups regarding the orthographic process:

After calculating t, we found out that:

Table t	Calculated t	Degree of freedom	Significance level
3.37	-78.19	78	0.001

The table shows that “t” is -78.19 at significance level 0.001, indicating statistically significant differences between the two groups. In this regard, the children of group 01 master the orthographic processes unlike the children of group 02.

10. Interpretation and discussion of the results:

The statistical findings of “t” test show significant differences between the two groups in using the cognitive contexts (logographic, alphabetical, and orthographic). This confirms the main hypothesis that states “There are differences between children with reading difficulties and the normal ones regarding the cognitive contexts that help reading acquisition”. In addition, we confirmed the 1st sub-hypothesis about the differences between children with reading difficulties and the normal ones regarding the logographical process.

In this context, the normal children made a 100% success while the children with reading difficulties made 89.06% success.

In addition, we confirmed the 2nd sub-hypothesis that tells “There are differences between children with reading difficulties and the normal ones regarding the alphabetical process”, as group one made a score of 100% compared to 17.91% for group 02. Thus, children with reading difficulties hardly make the phonological assembly and use their lexical knowledge as alternative strategies in the process of addressing, which is an already developed process. We must point that the phonological assembly is important in reading learning. Besides, the phonological procession allows the recognition of the written words through two methods. The 1st allows the direct movement based on the visual information that is used in recognizing the frequent words, i.e. the application of the logographic process. The 2nd is indirect and relies on the phonological assembly, i.e. the alphabetical process. According to Frith, the phonological assembly is a general process based on two different patterns, the first is automatic, covers the silent letters, and allows reading words, while the 2nd covers the voiced letters.

Moreover, we confirmed the 3rd sub-hypothesis that states “There are differences between children with reading difficulties and the normal ones regarding the orthographic process”. In so doing, we used the written words recognition test. In this context, group one had a score of 100% while the 2nd had a score of 41.35%, showing that the children with reading difficulties cannot use the orthographic process.

Based on what was said, we find out that each process affects the other, and that the non-mastery of one of them leads to reading difficulties. In addition, many modern studies point that the teachers’ knowledge about the difficulties faced by the students in reading and about how to deal with them provides the teacher with the ability to teach reading. In this regard, most of the teachers receive little training on how to develop reading. Dykstra & Bond (1967) and

Malmquist (1973) found out that the teacher is the most important factor in teaching reading, even more than the curricula and subjects. Therefore, it is necessary to focus on training teachers, mainly those who teach children with reading difficulties. In addition, Lyon & Moots (1997) see that the child cannot learn reading from the old method, i.e., the method that focused on the recognition of all the phonemes, because it exposes children to continuous failure in reading, as it is not possible to teach a reading program without focus on the components of building reading skills (cognition of the phonemes, phonetics, pronunciation, mastery, and reading comprehension). Therefore, most of the specialized universities hold training sessions and field studies to prepare teachers to teach reading to children who suffer difficulties and precondition some criteria for graduation.

Conclusion

Through Frith model, we found out more about the linguistic structure of Arabic, and that the child abilities are based on the developing knowledge and the abilities he gradually masters. Besides, the development of reading can be described based on these three contexts:

- The logographic process: It focuses on the relation between the word and its symbols, not letters, because these symbols are visual before being vocal.
- The alphabetical process: it is based on the rules of turning letters into sounds and the revision of the alphabetical lexicon before the phonological assembly.
- The orthographic process: It focuses on the visual recognition of the frequent words and relies on the phonological assembly for the rare words.

Our findings agree with those of Ammar (1997), Perfetti (1995), and Frith (1982), who conducted similar studies on French children with reading difficulties who cannot master the three contexts. Thus, we can say that children with reading difficulties cannot understand the meanings of words, recognize words, and understand sentences. Thus, they have low academic achievements.

Recommendations:

Based on the study results, we can suggest a set of recommendations as follows:

- It is necessary to train students to decode the voiced and voiceless sounds in words with no meanings and with different gradual lengths.
- It is necessary to train children on reading by analogy regarding the irregular new words based on the words they had learned.
- It is necessary to train children on the lexical selection by fostering attention and visual recognition of the similar words.
- The stakeholders in charge of the educational curricular should focus on the content of the texts and get the teacher rid of looking for the

tools that provide the best because he, in fact, looks for what satisfies his own desires, inclinations, and needs.

- It is necessary to focus on all the psychological and social aspects of the teachers to help him do his job as needed.
- The teachers must increase the efficiency of reading by training children on dividing and analyzing the written words to achieve the final outcomes.
- It is necessary to provide the efficient educational tools needed in reading activities.
- It is necessary to establish classes devoted for children with different difficulties.
- It is necessary to cope with the technological development and use it in the educational process.

References

- BONNET. C, CAMUS J.F et ALL. S, " Psychologie Cognitive ", collection grand amphi, Paris 1999, .
- BOREL-MAISON .S, « Langage oral et écrit », Ed. delchaux, 1985
- .-CONTENT . A : « Modèles de l'acquisition de la lecture : perspectives récents, approche cognitive des troubles de la lecture chez l'enfant », Marseille, 1996.
- SPLINGER. L, CASALIS. S, " Lire ", P.U.F, Paris, 1996
- DEBRAY, P. RITZEN , P . « Neuropsychiatrie infantile » 1er edition Masson , Paris 1981,
- ESTIENNE. F, " méthode d'entraînement à la lecture et dyslexie " ed. Masson, Paris, 1998, .
- Khairi al Maghazi Adjaj, difficulties of reading and reading comprehension (diagnosis and treatment), Vol. 01, Zahra Shark library, Cairo.
- PLAZA, M. « Les troubles d'apprentissage chez l'enfant » , ADSP, N° 26 Mars 1999,
- PERFETTI. A, " Représentations et prise de conscience au cours de l'apprentissage de la lecture", ed. DELACHAUX et NIESTLE, 199.
- Saaidoune Souheila, the relation between the working memory and comprehension of the written language for 04th fundamental grade children in 2003.