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STUDY OF STUDENTS' ACTUAL ORAL VOCABULARY MASTERY IN FRENCH AT SCHOOL ENTRY AND IN THE EARLY GRADES

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Contract Officer's Representative: Kadiatou Cisse Abbassi

Submitted by: **Chemonics International**

Sacré Coeur Pyrotechnie Lot No. 73, Cite Keur Gorgui

Tel: 221 78585 66 51

Email: LecturePourTousPMU@chemonics.com

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TABLE OF CONTENTS

EXECUTIVE SUMMARY 6
INTRODUCTION 8
1. OVERVIEW OF THE THEORETICAL FRAMEWORK 9
2. METHODOLOGY 14
2.1. Presentation of the investigation 14
2.2. Presentation of the sample 15
2.2.1. The selection criteria 15
2.2.2. Characteristics of the students in the sample 16
2.3. Evaluation Protocol 25
2.3.1. The tests developed 25
2.3.2. The characteristics of the words chosen for the tests 26
3. RESULTS 27
3.1. The results obtained on the vocabulary and reading test items 27
3.1.1. French Oral Vocabulary Tests 27
3.1.2. Pre-reading and reading tests 31
3.2. Vocabulary and reading test scores 33
3.2.1. Oral vocabulary in French 34
3.2.2. Pre-reading and reading 37
3.3. Explaining the variability of students' scores 42
3.3.1. Analytical method 42
3.3.2. Results of the oral French vocabulary test 43
3.3.4. Results of the pre-reading and reading tests 65
4. SYNTHESIS AND DISCUSSION 75
4.1. Review of the hypotheses 75
4.2. Evaluation of the hypotheses on the level of oral language in French and reading 76
4.2.1. Vocabulary test (of a word to groups of words) 76
4.2.2. Reading test 77
4.3. Other factors with an impact on the assessed capabilities 78
4.3.1. Contradictory results related to the geographic environment 78
4.3.2. Regarding academic activities 78

4.3.3. Regarding the academic achievement of teachers....80
4.3.4. Regarding means for class organization....80
4.4. Implications of the study results for education policies....81
4.4.1. Implications of the results related to the central study questions....81
4.4.2. Other implications of the study results for education policies....82
4.5. Several limitations of this study....84
4.6. In conclusion....84
5. BIBLIOGRAPHY....86
6. ANNEXES....90
6.1. Evaluation Protocol....90
6.2. Student Questionnaire....101
6.3. Student's parent's questionnaire....103
6.3. Teacher questionnaire....106

FOREWORD AND ACKNOWLEDGEMENTS

In order to improve the quality of pupils' learning, the Government of Senegal has embarked on a reform of the teaching of reading in the first years of primary school. This effort is supported by USAID through the Lecture Pour Tous program (LPT; 2016-2021). More specifically, this program supports the introduction of new methods of teaching and learning to read, and in particular the use of the three national languages Pulaar, Seereer and Wolof for the teaching of reading to pupils in the first three classes (CI, CP and CE1) of public elementary schools and daaras in seven regions of the country (Diourbel, Fatick, Kaffrine, Kaolack, Louga, Matam and Saint-Louis[1]).

The Lecture Pour Tous program includes a research component, which aims to conduct operational research to inform program activities, including policy support. This study is part of this scheme. It aims, on the one hand, to assess the level of mastery of oral vocabulary in French of pupils at the beginning of primary school and in the first years of the cycle, and on the other hand, to support the Ministry of National Education (MEN) in stabilizing the bilingual education model and more specifically in defining when and how to introduce French for the teaching of reading. In this perspective, the information needed to carry out this work required the construction of different instruments and their administration to different actors.

Construction of the survey instruments began in September 2018. The reference framework of the study and the protocol for evaluating student competencies were defined by Liliane Sprenger-Charolles (Centre National de la Recherche Scientifique (CNRS) / University of Aix-Marseille), while the contextual questionnaires were constructed by Adeline Seurat (Institut de Recherche sur l'Education (IREDU) / University of Burgundy). All the instruments were then discussed and validated by a team from the Institut National d'Etude et d'Action pour le Développement de l'Education (INEADE). The survey sample was developed by the Monitoring, Evaluation and Learning (MEL) team of the Lecture Pour Tous program.

The training of the interviewers took place in November 2018 in Kaolack. The administration of the survey took place during the same month in three Education and Training Inspectorates (IEFs): the Gossas IEF in the Fatick Academy Inspectorate (IA), the Kaolack Commune IEF in the Kaolack IA and the Kaffrine IEF in the Kaffrine IA. It was conducted under the supervision of Ibrahima Cissé and Mamadou Dramé for the Lecture Pour Tous program, and Alioune Cissé, El Hadji Sonko and Birama Touré for INEADE. Assana Diop (Lecture Pour Tous) prepared the tablets for data collection and compiled the files in December 2018.

Finally, the data analysis and report writing work was carried out by Adeline Seurat and Liliane Sprenger-Charolles between December 2018 and May 2019. A technical team bringing together experts from INEADE, DEE and DALN joined the international experts for a workshop in April 2019 to look at the first analysis of the data collected and to formulate preliminary results.

[1]. The Saint-Louis region benefits only from the technical support of the Lecture Pour Tous program, while the others receive technical and financial support.

EXECUTIVE SUMMARY

A crucial issue for the Lecture Pour Tous program, which aims to facilitate the learning of reading in Senegal through the use of new teaching methods and the use of national languages (NL), is to determine the most appropriate time to introduce the second language (L2) and generate other scientific evidence relevant to learning to read in the L2 for the benefit of decision-makers in the Ministry of National Education (MEN). The Lecture Pour Tous program has therefore been contracted by USAID to assess the level of oral vocabulary in French of students in the first three grades of primary school. This information is also used to inform the technical and political choices of the MEN in the framework of their bilingual teaching model, including the teaching of the L2 oral language in order to better prepare students for the introduction of reading in this language and to help its transfer from the NL.

For this study, tests to assess the oral vocabulary level of CI, CP and CE1 students, as well as their pre-reading (CI-CP) and reading (CE1) levels, were therefore developed. Questionnaires aimed at collecting information on linguistic, sociological and pedagogical factors likely to influence the results of the assessments were also constructed and administered to the students, their parents, and the teachers the students had had in the year preceding the study (those of CI for CP, those of CP for CE1).

Research from around the world indicates that reading requires both oral comprehension of the language. Research also indicates that, to understand a written message, it is necessary to have mastered decoding (assessed by reading invented words) as well as the lexical procedure for identifying written words (assessed by reading frequent words. The speed of decoding mastery depends on the regularity of grapheme-phoneme correspondence (GPC) in the language in which the learning takes place and on the lexical procedure of the learner's oral vocabulary level. Research also indicates that decoding mastery is a powerful self-learning mechanism, which is explained by the fact that once the most regular GPC have been acquired, it becomes easier to learn the less regular ones and, depending on the level of vocabulary mastery, to use the lexical and semantic knowledge to understand the written words.

These explanations make it possible to understand why starting to learn to read in one of the children's first languages can facilitate learning to read in French. When they have to learn to read in their first language (L1), most pupils have a level of oral language that enables them to understand the written language, which is not the case for most pupils learning to read in French in Senegal. Indeed, on the one hand, children have a better command of their oral L1 (especially the vocabulary of that language) than French. On the other hand, the spelling of these NLs (Wolof, Pulaar and Seereer, in this case in the Lecture Pour Tous program) is more regular than that of French (because their transcription with the Latin alphabet is recent), which should make it easier to understand the GPC and to transfer to a less regular spelling.

RESULTS

Level of the students' oral vocabulary in French

In the initial picture designation test, a stopping criterion has been set in order not to prolong this test unnecessarily for children with a very limited knowledge of the French language (after the 5th item of the first picture sheet in case only one correct answer had been given). Just under 24% of CI students did not go beyond the stop criterion, compared with less than 4% in CP and CE1.

Up to the start of CE1, the students' level of French oral vocabulary is very low: 85% of them are still unable to answer a single oral question involving several French words. The level of French oral vocabulary increases with the students' level of schooling and the time when this increase is greatest is during CI class.

The level of French oral vocabulary is stronger among students living in a socio-culturally privileged environment, and stronger when students benefit at home from activities in this language (reading, speaking and teaching them French words). However, proficiency is not very dependent on teachers' current practices on oral French

Decoding

The mastery of decoding in French (evaluated by a pre-reading test for CI and CP and a test in reading invented words for CE1) increases also with the students' level of schooling. The increase is again greatest during CI. At the beginning of CI, a third of students read no items on the pre-reading test, 27% read only one and 16% read only two. In total, over three quarters (77%) of students had a very limited pre-reading level. In CP, only 9% had a very limited level, while 44% read all or almost all of the items.

Vocabulary mastery and comprehension:

It is at the beginning of CE1 that the vast majority of students (93%) have reached a sufficient level of oral vocabulary in French for this to have a positive effect on their comprehension of written words in that language.

RECOMMENDATIONS

1. The analyses make it possible to target CI as the level most conducive to intensive work on oral vocabulary in French. Practices in this area should not be limited to isolated words and should take into account cultural differences (e.g. work on compound words and idiosyncratic expressions, specific to French).

2. Work on vocabulary should continue in the first grade so that the level of oral vocabulary in French at the entrance to the second grade allows students to begin learning to read in that language under good conditions.

3. At the beginning of CE1, learning to read in French must first focus on decoding and identifying written words, with work on comprehension beyond the word being done mainly orally.

4. Insofar as current teacher practices for teaching oral French have had little effect on vocabulary acquisition in French (unlike some family practices), the activities designed in the curriculum and teaching materials (teacher guides, stories to be read aloud, etc.) should be reviewed in order to work well, in a direct and explicit manner, on comprehension of oral French (from the word to the text through the sentence).

5. The same applies to **decoding practices, which must be based on the spelling characteristics of the language in which learning takes place.**

6. As regards **other code-related activities, the time teachers say they spend on letter-naming activities should be reduced.** This knowledge can mislead children: "lm" can be read as "elle aime", etc.

7. **Teachers should be trained** to develop effective activities in the two key areas for learning to read: decoding and vocabulary. To facilitate the transfer of reading skills in L1 to L2, they should be provided with specific information on the similarities and differences between French and L1 that they need to teach in decoding (grapheme-phoneme relations) as well as in other domains (vocabulary, morphosyntax, among others).

At the time of administration of the survey on which this study is based, the Lecture Pour Tous program was already implemented in some CI classes during the previous school year [2]. It was therefore necessary to take into account the fact that some students received hours of reading instruction in Pulaar, Seereer or Wolof during their CI year. This concerns 310 pupils out of the 399 who were assessed at the beginning of CP. The analyses carried out in this study showed that the pupils who had benefited from hours of decoding instruction in L1 in CI as part of Lecture Pour Tous had on average a better level of oral vocabulary in French and a better level of decoding than those who had not benefited from it (without any explanatory elements being able to be identified in this study). In order to better examine this finding, it would be recommended that assessments of students' decoding levels, depending on whether or not they have benefited from the program, be continued beyond CI (a follow-up of students over two or three years could usefully be conducted). Examination of the differences between decoding and the lexical procedure for identifying written words (which could not be taken into account beyond CI in this study) would make it possible to provide elements of explanation for the surprising effect of this program (centered on the national languages) on the level of oral vocabulary in French.

INTRODUCTION

To improve the quality of pupil learning, the Senegalese Government has embarked on a reform of reading instruction in the first years of primary school. This effort is supported by USAID through the Lecture Pour Tous program (2016-2021). More specifically, this program supports the introduction of new methods of teaching-learning to read based on scientific evidence and the use of national languages in the teaching of reading. Initially, interventions cover Pulaar, Seereer and Wolof for pupils in the first three classes (CI, CP and CE1) of public elementary schools and daaras in seven regions of the country (Diourbel, Fatick, Kaffrine, Kaolack, Louga, Matam, Saint-Louis[3]).

[2]. The construction of the survey sample on which this study is based has of course taken this situation into account.

[3]. The Saint-Louis region receives only limited technical support from the Lecture Pour Tous program, while the others receive comprehensive technical and financial support.

A critical question for the program is to determine the most appropriate time to introduce reading instruction in French as a second language (L2) for children whose first language (L1) is one of three national languages (NL): Pulaar, Seereer, or Wolof. To assist the Ministry of National Education (MEN) in finalizing the bilingual model for teaching and learning reading, including determining the most appropriate time to introduce this instruction in French as a second language (L2), the Lecture Pour Tous program (which includes a component aimed at conducting operational research) was commissioned to assess the level of oral vocabulary in French of students in the first three grades of the primary cycle.

This study has a two-fold perspective: (i) a perspective of knowledge of the level of mastery of oral vocabulary in French of pupils at the beginning of primary school and in the first years of the cycle; (ii) an operational perspective, to define the time and methods of introduction of French, both quantitatively (volume of time devoted) and qualitatively (content of activities), and thus to support the Ministry of National Education (MEN) in finalizing the bilingual model of teaching reading that it is currently defining.

In order to meet these objectives, we have constructed and administered tests to measure the level of oral vocabulary in French as a second language (L2) of the children enrolled in early CI, CP and CE1, as well as their level of pre-reading (in early CI and CP) and reading (in early CE1). This protocol was supplemented by three questionnaires (one for students, one for their parents, and one for the teachers that the students in CP and CE1 had in the year preceding the survey), which were designed to gather information on the linguistic, sociological and pedagogical factors likely to influence students' results in these assessments.

After a brief presentation of the theoretical framework of the study, we describe its methodology and examine the main results, taking into account their evolution according to grade level, as well as the impact of linguistic, sociological and pedagogical factors on them. In conclusion, we provide some answers to the question of when is the best time to introduce reading instruction in French L2, as well as some other recommendations for educational policies, while pointing out some of the study's limitations.

1. OVERVIEW OF THE THEORETICAL FRAMEWORK

The theoretical framework of the study is presented in detail in an accompanying document[4]. The summary of this framework presented below is intended to explain the methodological choices that were made and our assumptions.

By the time they have to learn to read, most students have a level of oral language in their L1 that allows them to understand written texts. In fact, research reports that early oral language knowledge (in particular, vocabulary level)[5] is a strong predictor of future reading comprehension. However, while reading comprehension of written language depends mainly on the level of oral language in a good reader, in a beginner it depends mainly on the automation of the written word identification procedure, which in turn depends on both the level of decoding

[4]. See the "Terms of Reference" of this project, adapted in part from various documents written by, under the direction of, or with, L. Sprenger-Charolles among others: [1] Sprenger-Charolles (2008). Report on the EGRA Senegal pilot study, World Bank; [2] RTI (2006). French adaptation by L. Sprenger-Charolles of the manual EGRA (second edition in 2016); [3] Sprenger-Charolles et al. (2019). Presentation of the EvalAide scheme, Ministry of National Education and Youth, France (See also Chapter 2 in Dehaene, 2019, pp. 85-158).
[5]. Perfetti (2007); Perfetti & Stafura (2014); Quinn, Wagner, Petscher et al. (2015).

and the level of oral vocabulary. These results were found in learning not only in L1 but also in L2 (among others, in English for Spanish speakers in the USA and in French for English speakers in Canada)[6]. When the process of identifying written words is automated, the reader can devote his or her cognitive resources to understanding what he or she is reading, provided that his or her level of oral language comprehension is sufficient, which is often problematic when learning in an L2[7].

Two other research findings are crucial to this study. The first is that the speed of automated decoding depends, in alphabetic writing, on the degree of regularity of the relationships between the smallest units of written language, graphemes, and the corresponding units of oral language, phonemes. Indeed, students learn faster and better to read in Spanish than in French, and in French than in English, which comes from the fact that grapheme-phoneme correspondences are more regular in Spanish than in English, with French spelling occupying an intermediate position, knowing that it is closer to that of Spanish, at least for reading[8]. The second important result for the present project is that the mastery of grapheme-phoneme (decoding) correspondences is a powerful self-learning mechanism[9], which comes from the fact that, when very regular correspondences have been acquired, it becomes easier to learn the less regular ones. These two results make it possible to understand why starting to learn to read in one of the children's NLs can facilitate learning to read in French. Indeed, on the one hand, the spelling of these NLs (Wolof, Pulaar and Seereer, in the present study) is more regular than that of French[10], which facilitates the understanding of grapheme-phoneme relationships and the transfer to a less regular spelling. On the other hand, children master their oral L1 better than in French.

Accordingly, children must be helped to develop accurate and rapid decoding skills, which in alphabetic writing requires early, intensive and systematic teaching of grapheme-phoneme correspondence. This type of teaching has a strong impact on children's later performance, including in reading comprehension of written texts, and is particularly beneficial for children at risk for sociological or linguistic reasons[11].

When children have automated the process of identifying written words, reading comprehension will depend essentially, as in adults, on the ability to construct a coherent representation of the message read, equivalent to that of the message heard. More precisely, to understand a text, it is necessary to relate several sentences[12] and, to do so, it is often necessary to make inferences [13], i.e. to deduce information that is absent in the text read (or heard). This ability depends on the subjects' knowledge of the language (L1 and L2) and their knowledge of the world, the latter being related to their cultural universe. In a bilingual

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[6]. For a synthesis on learning in L1, see Castles et al. (2018); in L2, see August & Shanahan (2006) and Murphy (2018).
[7]. See previous note.
[8]. For an overview, see Ziegler (2016).
[9]. For a summary, see Share (1995).
[10]. Because their writing in an alphabetical system using the letters of the Latin alphabet, is recent.
[11]. For summaries see: Early Literacy Panel (2008); National curriculum in England (2013); Rose (2006) as well as the article by Kolinsky et al. (2018) which points out that "phonics" methods, although more effective for children who learn to read when used early, are also the most effective for learning to read with illiterate adults. For data in French, see Riou & Fontanieu (2016).
[12]. For a synthesis, see parts C3 and C4 (understanding of statements and texts) of the Terms of Reference; see also Charolles (1995).
[13]. See on the relations between vocabulary and inferences, Currie & Cain (2015)..

context, attention must therefore be paid not only to linguistic differences that may hinder understanding, but also to cultural differences[14].

On the basis of this frame of reference and the objectives of this study, we have developed several tests to assess the level of students' oral vocabulary in French. One of the tests in the protocol was adapted from a test often used to assess this level in children aged 3 to 8 years: the designation of the image which, among several, corresponds to a word given orally by the person taking the test. The words selected (from nouns and verbs), more or less frequent, are adapted to the age of the pupils examined. In another test, the pupils had to perform simple actions ("show a part of their body": the 'nose', 'eyes', then the 'neck' which is a less frequent term) or more complex actions ("put a stone in front of [or behind] him")[15].

On the other hand, we have developed a pre-reading test for the CI and CP, as well as a reading test for the CE1. The choice of two different tests is justified by the results of research. Studies with students with French as an L1 have indeed shown that scores in reading isolated words increase progressively between the beginning and the middle of CP and, especially, between the middle of CP and the end of that class: the evolution is then both quantitative and qualitative, as shown by certain changes observed between the middle and the end of CP for reading different types of words. Indeed, in mid-CP, frequent regular words (such as "table") are not read any better than invented words (such as "topple"), and scores on even very frequent irregular words are very low, as these items give rise to many phonological errors ("sept" read as "Septembre"). These results indicate that the students then mainly use decoding, but not the lexical procedure of identifying written words. A few months later (end of CP), the picture is different. Regular words are then read better than invented words [16]. The advantage of regular words over invented words (which was not found in a study with Senegalese children in the first three classes)[17] is the first sign of use of the lexical procedure for identifying written words. It is explained by the fact that regular words benefit from regularity and frequency, which is not the case for invented words, which only benefit from regularity. On the other hand, at the same time, scores on irregular words (which only benefit from frequency) are still very low[18].

Finally, three questionnaires were developed to gather information on linguistic, sociological and pedagogical factors that might influence the results of the assessments: one was intended for students, another for their parents and a final one for teachers that students currently in CP and CE1 had the previous year (in CI and CP respectively).

MAIN ASSUMPTIONS OF THIS STUDY

When they have to learn to read in their L1, most students have a level of oral language in that language that allows them to understand written language. The main problem for a beginner reader in an L2 is that his or her level of oral comprehension in that L2, and especially his or

[14]. See August & Shanahan (2006) and Murphy (2018).

[15]. See part C1 (vocabulary) of the frame of reference. It should be noted that we had asked to be able to take at least one of the vocabulary tests not only in French but also in the NL which is most often used in Senegal (Wolof). This was not possible, which limits the scope of the present project.

[16]. See the longitudinal study by Sprenger-Charolles et al. (2003), and the synthesis of francophone studies by Deacon et al. (2017)

[17]. Sprenger-Charolles (2008). Report on the EGRA Senegal pilot study, World Bank.

[18]. See the longitudinal study by Sprenger-Charolles et al. (2003) and the synthesis of francophone studies by Deacon et al. (2017); see also part B1.2 of the reference framework (Evaluation of word identification procedures).

her level of vocabulary[19], is often not sufficient to enable him or her to understand what he or she is reading in that language. Consequently:

- The first hypothesis (H1) is that in order to understand what they read in French, students should be able to understand not only isolated words orally, but also the sequences of a few words.

- The second hypothesis (H2) has three components, the first two of which are related to the first hypothesis: these students' level of oral vocabulary in French ($H2^{voc}$), everything such as their level of pre-reading or reading ($H2^{lec}$), should increase with their level of schooling. This evolution should make it possible to determine at what level of mastery of oral French (individual words and groups of words) it becomes possible to learn to read in this L2 ($H2^{voc\text{-}lec}$).

However, in order to understand what he reads in alphabetical writing, a student must not only have a certain level of comprehension of the oral language in which he reads, in both L1 and L2, he must also have automated decoding. As already mentioned, the speed of this automation depends on the degree of regularity of the relationships between the smallest units of written language, graphemes, and the corresponding units of oral language, phonemes. Moreover, the mastery of decoding (of grapheme-phoneme correspondences) is a powerful self-learning mechanism, which stems from the fact that, when the most regular correspondences have been acquired, it becomes easier to learn the less regular ones.

These data[20] help us understand why starting to learn to read in one of the children's NLs can facilitate learning to read in French. Indeed, on the one hand, the spelling of these NLs (here, Wolof, Pulaar and Seereer) is more regular than that of French, which facilitates the understanding of grapheme-phoneme relations and the transfer to a less regular spelling. On the other hand, children master their L1 better orally than in French. In particular, their level of oral vocabulary in their L1 is higher than their level in French L2, which should have an impact on the lexical procedure for identifying French written words. The above predictions can be evaluated, at least partially, by the results obtained in CE1 in the reading test which, at this grade level, contains items that examine the functioning of the decoding (by reading invented words) and the lexical procedure for identifying written words: decoding (by reading invented words) and the lexical procedure (by reading words from French but also from their NL). Within this framework, it is possible to put forward a series of hypotheses concerning the relations between the level of oral vocabulary in French and that of decoding and the lexical procedure for identifying written words.

- The third hypothesis (H3) has two components: if the students in CE1 use, in addition to the phonological procedure (decoding), the lexical procedure for identifying written words, the words in their NL should be read better than invented words or words in French (H3lec). In addition, their French oral vocabulary level should reflect their French word reading scores ($H3^{voc\text{-}lec}$).

- The fourth set of hypotheses (H4) concerns activities in French. While activities related to vocabulary and oral comprehension should have a positive impact on the level of oral

[19]. See August & Shanahan (2006) and Murphy (2018).
[20]. For the L1, see the synthesis of Castles et al. (2018) and, for L2, see August & Shanahan (2006) and Murphy (2018).

vocabulary in French ($H4^{voc1}$), activities related to coding should facilitate the acquisition of decoding ($H4^{lec1}$). It is also possible to predict that participation in the Lecture Pour Tous program should have a positive impact on decoding ($H4^{lec2}$) and, in turn, on the lexical procedure for identifying written words ($H4^{lec3'}$), as well as on the level of oral vocabulary in NL ($H4^{lec\text{-}voc}$).

These different hypotheses do not take into account the characteristics of the pupils and their family and school environment (for those who are already at school). These contextual factors could have an influence on students' level of oral vocabulary in French and/or on the level of the written word identification procedure.

- The fifth set of hypotheses (H5) is that some of these characteristics are related to the child's environment outside of school, particularly his or her social environment ($H5^{1}$). The level of oral vocabulary in French, as well as the level of written word identification, are assumed to be better in students from a favored socio-cultural background ($H5^{voc1}$ for vocabulary[21] and $H5^{lec1}$ for written word identification)[22]. In addition, children who benefit from having someone in their environment who spends time talking to them, teaching them new words or reading them stories in French ($H5^{2}$), should have a better level of oral vocabulary ($H5^{voc2}$) in that language, and a better level of reading ($H5^{lec2}$), than those who do not benefit from such an environment [23].

- The sixth set of hypotheses (H6) concerns factors related to the child's school environment, in particular, the place given to the activities of teaching-learning oral vocabulary in French to the activities on decoding (cf. above the hypotheses $H4^{lec}$, $H4^{voc}$ and $H4^{lec\text{-}voc}$). Also assumed to have a facilitating effect on the acquisition of oral vocabulary in French ($H6^{voc}$) as well as on the procedures specific to reading in this language (decoding and lexical procedure for the identification of written words, $H6^{lec}$), are the skills of teachers in French as they can be apprehended by their level of training ($H6^{voc1}$ and $H6^{lec1}$) or by the perception they have of their skills in this language ($H6^{voc2}$ and $H6^{lec2}$).

[21]. For the L1, see for data in French: Gentaz et al. (2013), and, for data in English: Hoff (2006); Noble & McCandliss (2005); in L2, see the summaries of August & Shanahan (2006) and Murphy (2018).

[22]. Although the level of written word identification is lower in children from disadvantaged socio-cultural backgrounds, the difference according to background is greater in the area of comprehension, including vocabulary, especially in L2, cf.: August & Shanahan (2006) and Murphy (2018).

[23]. Insofar as the socio-cultural level of the family (which integrates the parents' level of education, their ability to read and their profession) is strongly correlated with the degree of fluency in French, no hypothesis takes into account only the parents' level of mastery of French.

2. METHODOLOGY

This section presents the methods used to construct the survey instruments on which our study is based (2.1), then the principles that guided the selection of the sample, as well as the characteristics of this sample (2.2), and finally, the protocol for evaluating student skills (2.3).

2.1. PRESENTATION OF THE INVESTIGATION

In order to assess the level of French oral vocabulary of early elementary students, a protocol to examine their French oral vocabulary skills (as well as their reading skills) was constructed and administered to students in CI, CP, and CE1 (Instrument 1a, which will be presented in section 2.3). Once the students' proficiency levels were known, analyses then sought to explain their variability. Two additional avenues of explanation are considered.

The first lies in the private sphere of the pupils: it consists in estimating the extent to which the characteristics of the pupils (age, sex, pre-school background, etc.) and their family environment (socio-cultural and linguistic situation, proximity to French in their daily life, etc.) can explain the variability of their test scores. To obtain this information, a number of questions were asked directly to the students (Instrument 2) and to one of their parents (Instrument 3). While this avenue of explanation is interesting in itself, the variables that make it up will also serve as controls in the following analyses (to reason with equivalent characteristics and environment).

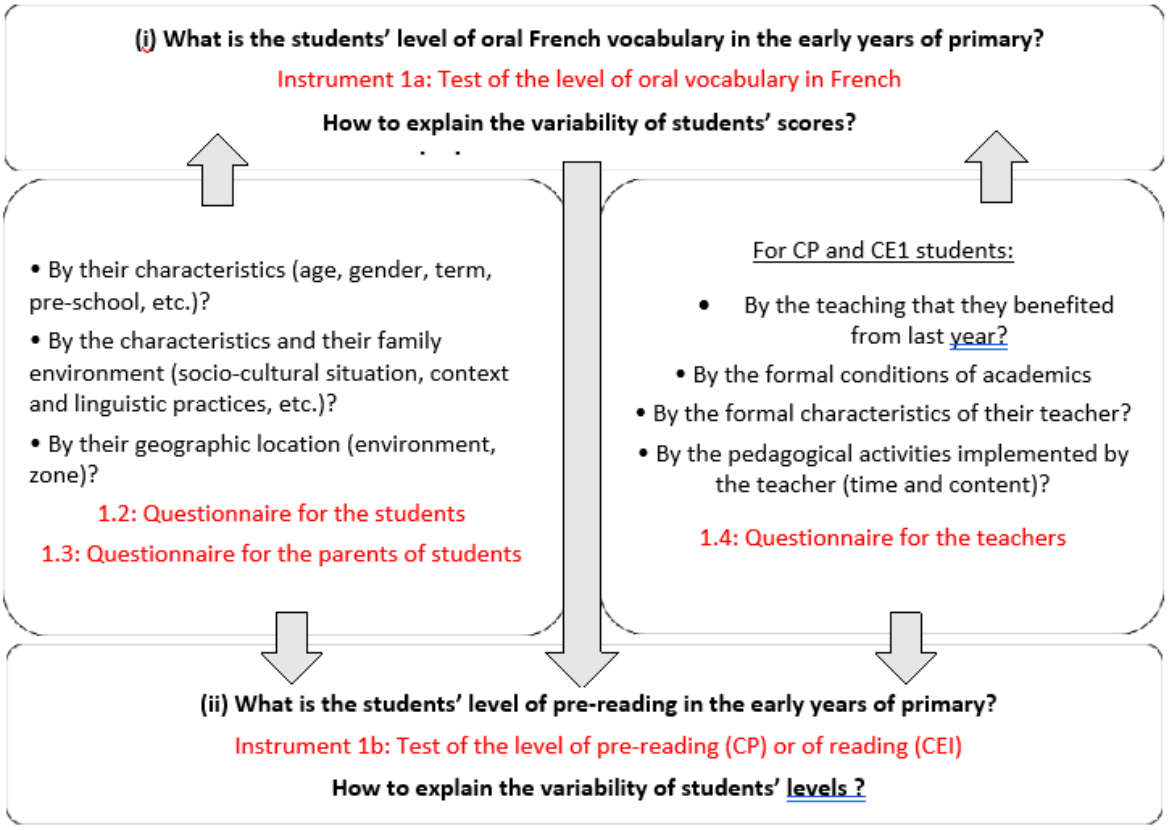
The second track is more directly related to the school sphere, i.e., the education that the students received in the year preceding the survey. Here too, several dimensions are involved: (i) the formal characteristics of the classroom (number of pupils, availability of textbooks, etc.); (ii) the formal characteristics of the teacher (his or her level of initial and continuing training, number of years of experience, etc.); (iii) teachers' perception of their fluency in French; (iv) the time allocated to certain teaching-learning activities for oral vocabulary in French; and (v) the content of the activities implemented for the teaching-learning of oral vocabulary in French. This information, which concerns only children in CP (who were in CI the previous year) and CE1 (who were in CP the previous year), is provided by questionnaires administered to the teachers that the students had the year before the survey (Instrument 4).

To determine the most appropriate time to introduce reading instruction in French L2, students' French oral vocabulary level must be compared with their pre-reading or reading level. A protocol to examine their pre-reading and reading skills was therefore constructed and administered to the students (Instrument 1b, presented in Part B3). Once the pre-reading and reading levels of the students were known, the aim was to try to explain their variability, on the one hand, by the characteristics of the students and their family environment, on the other hand, and for CP and CE1 students, by the instruction they had received in the year preceding the survey, and finally, by their level of oral vocabulary in French. The aim is to analyse whether and to what extent the level of students' oral vocabulary in French has an effect on their pre-reading or reading level, and to identify whether there is a minimum level of vocabulary that students need to have in order to optimally approach learning to read.

The information needed to carry out this study therefore required the construction of different instruments and their administration to different actors (Figure 1 below). These different data were then consolidated and merged into a single database, making it possible to have each student's results for each item in the assessment protocol, to know his or her characteristics

and those of his or her parents, and, for those in CP and CE1, to have information on what they did in class the previous year.

Figure 1: Presentation of the study instruments



2.2. PRESENTATION OF THE SAMPLE

Before presenting the criteria that guided the selection of the sample, it should be recalled that the Lecture Pour Tous program supports the introduction of reading instruction in Pulaar, Seereer and Wolof for pupils in the first three primary grades (CI, CP and CE1) in public elementary schools and daaras in seven regions of the country (Diourbel, Fatick, Kaffrine, Kaolack, Louga, Matam, Saint-Louis). Implementation of the program began at the beginning of the 2017-2018 school year (year 1 of the program) for CI pupils in 487 schools in the Fatick, Kaffrine and Kaolack regions, and then in 2018-2019 (year 2 of the program) for CI pupils in 2,263 schools in the Diourbel, Fatick, Kaffrine, Kaolack, Louga and Matam regions. It should also be noted that the national language used to teach reading (Pulaar, Wolof or Seereer) is determined at the level of each school.

2.2.1. The selection criteria

Logically, the survey targeted the program's intervention areas. For logistical reasons, three regions close to each other were chosen: Fatick, Kaolack and Kaffrine. Among them, three Education and Training Inspectorates (IEF) were then selected at random: the Gossas IEF in the Fatick IA, the Kaolack Commune IEF in the Kaolack IEF, and the Kaffrine IEF in the Kaffrine IA.

The construction of the survey sample then sought to respect (i) the distribution of the number of pupils enrolled between these three IEFs, then within each IEF, the distribution (ii) according to the place of residence (urban/rural) and (iii) according to the language chosen for the school and finally, (iv) the distribution of schools according to the year the program was set up (year 1 or year 2). Once these criteria were applied, a number of schools were selected on a random basis. The next step was to contact the school principals to find out whether the teachers who were holding the CI and CP classes in 2017-2018 were still present in the school for the year 2018-2019. When this was not the case, the school was replaced by another one with the same characteristics (IEF, environment, national language chosen for the school, year of implementation of the program). Finally, within each elementary school, the test was administered to ten students (non-repeaters and trying to maintain a balance between boys and girls) from CI, CP and CE1. In total, the sample size was 1,183 students: 388 from CI, 399 from CP and 396 from CE1. Their distribution among the different IEFs according to background, school language and date of entry into the Lecture Pour Tous program is shown in Table 1 below.

Table 1: Distribution of schools and students surveyed by region

IA		Fatick	Kaffrine	Kaolack	Overall
IEF		Gossas	Kaffrine	Kaolack Commune	
Number of schools - students		15 - 449	21 – 554	6 - 180	42 - 1183
Location	Urban	1 - 30	1 – 30	6 - 180	8 - 240
	Rural	14 - 419	20 – 524	0 - 0	34 - 943
Tongue	Pulaar	1 - 30	0 – 0	0 - 0	1 - 30
	Seereer	5 - 149	1 – 30	1 - 30	7 - 209
	Wolof	9 - 270	20 – 524	5 - 150	34 - 944
LPT entry year	Year 1 (2017-18)	12 - 359	13 – 379	5 - 150	30 - 888
	Of which CP[24]	*12 - 120*	*14 – 140*	*4 - 40*	*30 - 310*
	Year 2 (2018-19)	3 - 90	7 – 175	1 - 30	11 - 295

2.2.2. Characteristics of the students in the sample

Information on student characteristics was collected directly from the students, as well as from one of their parents. We will first examine the characteristics of the students and their family environment, then those of their parents, before looking at the linguistic context in which they live.

Formal characteristics of students and their families

Table 2 below provides information on a number of characteristics of the students in the sample.

Table 2: Distribution of students by some of their characteristics

	CI		CP		CEI		Overall	
	N	%	N	%	N	%	N	%
Number of students	388	-	399	-	396	-	1,183	-
Gender								
Boys	187	48.2%	197	49.4%	184	46.5%	568	48.0%
Girls	201	51.8%	202	50.6%	212	53.5%	615	52.0%
Age (in years)								
Average	7.2		8.3		9.8		8.4	
Min-Max	5-13		6-18		6-16		5-18	
Preschool								
No	333	85.8%	282	70.7%	289	73.0%	904	76.4%
Yes	55	14.2%	113	28.3%	105	26.5%	273	23.1%
Duration of preschooling								
1 year	15	27.3%	32	28.3%	29	27.6%	76	27.8%
2 years	8	14.5%	47	41.6%	41	39.0%	96	35.2%
3 years	14	25.5%	34	30.1%	35	33.3%	83	30.4%
NSP	18	32.7%	0	0.0%	0	0.0%	18	6.6%
Type of preschooling								
Pre-elementary class	3	5.5%	0	0.0%	1	1.0%	4	1.5%
Kindergarten	30	54.5%	14	12.4%	3	2.9%	47	17.2%
Private kindergarten	0	0.0%	1	0.9%	4	3.8%	5	1.8%
Franco-Arab kindergarten	1	1.8%	27	23.9%	15	14.3%	43	15.8%
Community	0	0.0%	10	8.8%	11	10.5%	21	7.7%
Daara	3	5.5%	61	54.0%	71	67.6%	135	49.5%
Live with both parents								
Yes	326	84.0%	316	79.2%	322	81.3%	964	81.5%
No, with one only	36	9.3%	42	10.5%	39	9.8%	117	9.9%
No, with neither of them	24	6.2%	38	9.5%	35	8.8%	97	8.2%
Siblings								
No	15	3.9%	16	4.0%	14	3.5%	45	3.8%
Yes, younger	72	18.6%	79	19.8%	80	20.2%	231	19.5%
Yes, older	55	14.2%	47	11.8%	40	10.1%	142	12.0%

	CI		CP		CE1		Overall	
	N	%	N	%	N	%	N	%
Yes, younger and older	244	62.9%	254	63.7%	262	66.2%	760	64.2%

A first piece of information concerns the gender of the pupils: girls are slightly more numerous than boys (52% against 48%). As regards the age of pupils, the average is 7 years in CI, 8 years in CP and 10 years in CE1, although for each of these classes it varies from 5 to 13 years among CI pupils, 6 to 18 years among CP pupils and 6 to 16 years among CE1 pupils (extremes being of course not very frequent). Finally, the vast majority of students (just over 80%) live with their parents; only 10% live with only one parent and 8% with neither. Furthermore, almost all students (96%) have siblings.

As regards the pupils' pre-school background, it should first be noted that information on CI pupils was not collected at the time of the survey, but a few weeks later, from a form given to school principals. It would seem that the instructions for filling in the forms were not sufficiently explicit. The pre-school enrolment rate for CI pupils is much lower than that recorded for CP and CE1 pupils (14% compared to 28% and 26% respectively). Since the number of pupils who have attended a pre-school daara is much lower among CI pupils (5%) than among those in the other two classes (54% and 68%), it may be hypothesized that some pupils who have attended this type of pre-school were not considered to have been preschoolers. These data should therefore be treated with caution. Among CP and CE1 pupils who have been preschoolers, there is a certain variety in the length of preschooling, ranging from one year to three years (a slight majority of children having been preschoolers for two years).

To gather information on the characteristics of the parents or caregivers of the students, the investigator interviewed one parent, who indicated, for him and the other parent[24], their level of reading ability and their level of education. This information is presented in Table 3 below. It seemed more relevant to us to consider both parents' information on their reading ability and educational level combined, in order to try to better understand the child's context on these two dimensions.

Table 3: Distribution of students according to parents' reading ability and education level

[24]. For 16 children in the sample, only one parent is involved.

		CI		CP		CE1		Overall	
		N	%	N	%	N	%	N	%
Number of students		388		399		396		1,183	
Parents' reading ability									
Neither knows how to read		161	41.5%	134	33.6%	142	35.9%	437	36.9%
Only one knows how to read		139	35.8%	165	41.4%	163	41.2%	467	39.5%
Both know how to read		88	22.7%	100	25.1%	91	23.0%	279	23.6%
Parents' level of education									
Parent 1	Parent 2								
No schooling	No schooling	194	50.0%	176	44.1%	182	46.0%	552	46.7%
No schooling	Alpha / primary	98	25.3%	107	26.8%	109	27.5%	314	26.5%
No schooling	Secondary or +	30	7.7%	33	8.3%	32	8.1%	95	8.0%
Alpha / primary	Alpha / primary	28	7.2%	39	9.8%	44	11.1%	111	9.4%
Alpha and +	Secondary and +	38	9.8%	44	11.0%	29	7.3%	111	9.4%

While just over one-third of children (37%) have parents who cannot read, 39% have one literate parent and 24% have two literate parents. This trend is more or less the same for the pupils in all three classes. In addition, the parents of almost half of the children (47%) have never been to school. The level of schooling of the other half of the children can be broken down as follows: 34% of them have one parent who has never been to school, the other having reached primary school or participated in a literacy program (26%), or secondary school or higher (8%). Finally, 19% of the children have two parents who have been to school (9% have parents who have attended a literacy program or reached primary school, and 9% have one parent in the same situation and another who has reached secondary school or higher).

Students were also asked questions to help them understand the place of reading in their homes. Several dimensions were thus examined: the presence of books in the home and their use by the pupils, the presence of a person who knows how to read at home (not necessarily a parent) and whether the pupils spend time looking at or reading books with this person. This information is presented in Table 4 below.

Table 4: Distribution of students according to their relationship to reading at home

	CI		CP		CE1		Total	
	N	%	N	%	N	%	N	%
Books at home	60	15.5%	190	47.6%	213	53.8%	463	39.1%
Looks / reads	52	13.4%	182	45.6%	201	50.8%	435	36.6%
Does not look / read	8	2.1%	8	2.0%	12	3.0%	28	2.4%
No books at home	328	84.5%	209	52.4%	183	46.2%	720	60.9%
Overall	388	100.0%	399	100.0%	396	100.0%	1183	100.0%
Someone at home knows how to read	243	62.6%	314	78.7%	338	85.4%	895	75.7%
Looks / reads with	159	41.0%	186	46.6%	217	54.8%	487	47.5%
Does not look / read with	84	21.6%	128	32.1%	121	30.6%	408	28.1%
Nobody knows how to read	145	37.4%	85	21.3%	58	14.6%	288	24.3%
Overall	388	100.0%	399	100.0%	396	100.0%	1183	100.0%

Just over two-thirds of students (39%) say there are books in their homes, and among them, the vast majority (94%) say they look at or read them. Beyond this general trend, we observe that these figures actually increase with the student's grade. In fact, the proportion of pupils declaring that they have books at home increases from 15% among CI pupils to 48% among CP pupils and 54% among CE1 pupils. In total, 13% of CI students report looking at or reading books at home, compared to 46% of CP students and 51% of CE1 students.

The vast majority of students (76%) say that someone close to them (not necessarily a parent) can read, and just over half (54%) say that this person spends time looking at or reading books with them. Again, we find that the proportion of students reporting that they spend time with someone watching or reading books increases with the class. Indeed, while overall this figure is 47%, it actually varies from 41% among CI students to 47% among CP students and 55% among CE1 students.

The above information was combined to find out to what extent children spend time looking at or reading books and how they do so (Table 5 below). Only one-quarter of CI students spend time looking at or reading books at home, with 9% doing so alone and with someone who can read. This proportion rises to 60% among CP students and 70% with those in CE1; among them, one-third do so alone and with someone who can read.

Table 5: Distribution of pupils according to their general reading practice

	CI		CP		CE1		Total	
	N	%	N	%	N	%	N	%
Does not read	286	73.7%	162	40.6%	120	30.3%	568	48.0%
Reads alone or with someone	67	17.3%	102	25.6%	131	33.1%	300	25.4%
Reads alone and with someone	35	9.0%	135	33.8%	145	36.6%	315	26.6%
Overall	388	100.0%	399	100.0%	396	100.0%	1183	100.0%

In summary, a minority of pupils benefited from pre-school activities (14% of CI pupils, 28% of those in first grade and 26% of those in second grade1). Children in the last two classes

mostly attended a daara (54% of CP children, 68% of CE1 children, compared to about 5% of CI children). However, the differences noted between CI pupils and those in the other two classes should be taken with caution: some CI pupils who had attended a daara were probably considered not to have attended pre-school. As regards the pupils' family environment, about one pupil in two has at least one parent who has attended school, the majority having reached primary level at best. Similarly, the majority of them (59 to 66% depending on the class) have at least one parent who can read. Finally, half of the pupils report practicing reading at home and having books, with these proportions increasing with the school level: from 26% in CI to 59% in CP and 70% in CE1 for reading activities; from 25% in CI to 48% in CP and 54% in CE1, for the presence of books at home.

The students' linguistic context

A range of information collected from both pupils and their parents' concerns the linguistic environment in which the pupils live. This dimension is important: the languages that children use in their daily lives may differ in many areas of language, which can affect reading learning. These domains include:

. **Phonology**: for example, differences in the number and nature of consonants and vowels (see B4.1 in the Framework);
. **Spelling**: for example, differences in the notation of vowels written in languages which have more than six vowels (reminder: there are only 6 letters in the alphabet to write them, cf. B4.2 in the reference frame);
. **Grammatical morphology**: for example, some languages have a neutral gender while others don't mark the gender; another example, the marking of the past and future tense, which can be integrated into the verb (as in French: *il est venu, il viendra, il va venir*) or be carried only by words like yesterday, tomorrow, before, after..., without any mark on the verb (cf. C2.1 and C2.2 in the reference frame);
. **The lexical morphology**: for example, presence of classifiers in African languages, such as <*ier*> which designates the name of a profession or a tree in French (cf. C2.2).

Other differences are more related to culture: for example, there are many terms that can refer to different ways of walking in some African languages (see C1.1 in the framework); other examples are presented in the section on inferences based on knowledge of the world (see C4.2 in the framework).

Two dimensions are examined in the questionnaires: the language(s) that pupils use in their daily lives and the degree of familiarity of pupils with French. Before that, the first question concerns, in a classical way, the mother tongue of the pupils' parents. The information is presented in Table 6 below.

Table 6: Distribution of students according to their parents' mother tongue

Mother tongue of parents	CI		CP		CEI		Total	
	N	%	N	%	N	%	N	%
One native language only	355	91.5%	363	91.0%	367	92.7%	1,085	91.7%
Wolof	215	55.4%	231	57.9%	217	54.8%	663	56.0%
Pulaar	38	9.8%	38	9.5%	48	12.1%	124	10.5%
Seereer	93	24.0%	90	22.6%	85	21.5%	268	22.7%
Other	9	2.3%	4	1.0%	17	4.3%	30	2.5%
Two native languages	33	8.5%	36	9.0%	29	7.3%	98	8.3%
Total	388	100.0%	399	100.0%	396	100.0%	1,183	100.0%

The vast majority of children (92%) live in a family where the parents have the same mother tongue: Wolof in 56% of cases, Seereer in 23%, Pulaar in 10% and another language in 2% of cases. In only 8% of families do the parents have different mother tongues. This tendency is found in all three classes.

However, the mother tongue is not sufficient to characterize the family linguistic environment, as parents may not use their mother tongue to speak to their child. It is therefore useful to examine the language(s) actually spoken at home (Table 7 below). The overwhelming majority (83%) of students speak only one language at home. Of these, 64% speak Wolof, 14% speak Seereer, 5% speak Pulaar and 1% speak another language. This means that 17% of pupils speak at least two languages at home.

Table 7: Distribution of pupils by language spoken at home

Language spoken at home	CI		CP		CEI		Total	
	N	%	N	%	N	%	N	%
One language only	317	81.7%	336	84.2%	331	83.6%	984	83.2%
Wolof	244	62.9%	264	66.2%	248	62.6%	756	63.9%
Pulaar	17	4.4%	20	5.0%	19	4.8%	56	4.7%
Seereer	55	14.2%	52	13.0%	57	14.4%	164	13.9%
Other	1	0.3%	0	0.0%	7	1.8%	8	0.7%
Two or more languages	71	18.3%	63	15.8%	65	16.4%	199	16.8%
Total	388	100.0%	399	100.0%	396	100.0%	1,183	100.0%

Students were also asked about the language(s) they use with their friends. This information is given in Table 8 below. It emerges that the vast majority of pupils speak only one language with their friends: Wolof for 71% of them, Seereer for 14% and Pulaar for 2%. Twelve per cent of them say they speak two languages with their friends (1% say they speak French) and 1% use three languages.

Table 8: Distribution of students according to the language spoken with their friends

Language spoken	CI		CP		CE1		Total	
	N	%	N	%	N	%	N	%
One language	341	87.9%	353	88.5%	338	84.1%	1032	86.8%
Wolof	273	70.4%	293	73.4%	274	68.2%	840	70.6%
Pulaar	9	2.3%	8	2.0%	10	2.5%	27	2.3%
Seereer	59	15.2%	52	13.0%	53	13.2%	164	13.8%
Other	0	0.0%	0	0.0%	1	0.2%	1	0.1%
Two languages	45	11.6%	42	10.5%	55	13.7%	142	11.9%
French	3	0.8%	4	1.0%	9	2.2%	16	1.3%
Three languages	2	0.5%	4	1.0%	9	2.2%	15	1.3%
Overall	388	100.0%	399	100.0%	402	100.0%	1189	100.0%

From the information provided by parents and students on the language(s) spoken at home and with friends, we sought to identify how many and which languages are most used by students outside school (Table 9 below). In fact, in their daily lives, 25% of the pupils use at least two languages, while the remaining 75% of them live in a monolingual context: 62% use only Wolof, 11% Seereer and 2% Pulaar.

Table 9: Distribution of pupils according to the number of languages used in daily life

Languages in daily life	CI		CP		CE1		Total	
	N	%	N	%	N	%	N	%
One language	294	75.8%	303	75.9%	291	73.5%	888	75.1%
Wolof	242	62.4%	256	64.2%	233	58.8%	731	61.8%
Pulaar	9	2.3%	6	1.5%	10	2.5%	25	2.1%
Seereer	43	11.1%	41	10.3%	47	11.9%	131	11.1%
Other	0	0.0%	0	0.0%	1	0.3%	1	0.1%
Two or more languages	94	24.2%	96	24.1%	105	26.5%	295	24.9%
Overall	388	100.0%	399	100.0%	396	100.0%	1183	100.0%

A second set of information about the students' linguistic environment relates to their level of familiarity with French. Parents of students were asked whether they understand, read and write French. Their answers to these three questions were cross-tabulated to define their level of comfort in French (Table 10 below). It can be seen that nearly three quarters (74%) of the students have parents who are not or not very comfortable in French. The next 17% have parents who are moderately comfortable. Finally, only 9% have parents who are comfortable or very comfortable in French. This general trend applies to the students in all three classes, with a slightly higher proportion of students in first grade having parents who are comfortable in French.

Table 10: Distribution of Students by Level of Comfort in French of Their Parents

Fluency in French	CI		CP		CE1		Total	
	N	%	N	%	N	%	N	%
Poor	290	74.7%	286	71.7%	297	75.0%	873	73.8%
Average	65	16.8%	68	17.0%	69	17.4%	202	17.1%
Good	33	8.5%	45	11.3%	30	7.6%	108	9.1%
Overall	388	100.0%	399	100.0%	396	100.0%	1183	100.0%

It is not enough for parents to be comfortable in French for students to necessarily benefit from learning in that language. Moreover, parents are not the only ones who are involved in their child's life in this regard. As a result, students were asked whether someone in the home speaks French and how often that person speaks to them in that language. This information was combined to highlight the frequency of interaction between the students and a French-speaking person in their immediate environment. They are presented in Table 11 below.

Table 11: Distribution of students by degree of interaction with a French-speaking person at home

Interactions in French	CI		CP		CE1		Total	
	N	%	N	%	N	%	N	%
Someone speaks French	136	35.1%	179	44.9%	200	50.5%	515	43.5%
Frequency of interactions								
None	89	22.9%	97	24.3%	89	22.5%	275	23.2%
Occasionally	30	7.7%	45	11.3%	59	14.9%	134	11.3%
Regularly	17	4.4%	37	9.3%	52	13.1%	106	9.0%
Nobody speaks French	252	64.9%	220	55.1%	196	49.5%	668	56.5%
Total	388	100.0%	399	100.0%	396	100.0%	1183	100.0%

Slightly more than half of the children (56%) have no one at home with whom to speak French. Of the 43% of students who have someone who speaks French at home, 9% interact in that language with that person on a regular basis ("a few times a week" or "every day"), 11% occasionally and 23% never. The proportions of students who interact in French with people around them increase with grade level: from 12% in CI to 21% in CP and 28% in CE1. These figures are interesting to consider, inasmuch as it would no doubt be beneficial for children if interactions in French were initiated at an early age.

A final question concerns whether children watch French-language programs on television (Table 12 below). Overall, just over half of children (54%) watch programs in French. Moreover, their proportion increases with the level of schooling (48% in CI, 54% in CP and 61% in CE1).

Table 12: Distribution of students according to whether they watch TV programs in French

French TV	CI		CP		CE1		Total	
	N	%	N	%	N	%	N	%
Yes	188	48.5%	214	53.6%	242	61.1%	644	54.4%
No	200	51.5%	185	46.4%	154	38.9%	539	45.6%
Overall	388	100.0%	399	100.0%	396	100.0%	1183	100.0%

In summary, the sample includes a majority of monolingual students (75%), who mainly use Wolof (62% of the sample against 11% for Seereer and 2% for Pulaar). A quarter of the students use at least two languages in their daily lives. With regard to the use of French, 74% of the children have parents with a low level of proficiency in this language. Moreover, for 56% of the children, no one speaks French at home. However, this proportion decreases with school level (from 65% in CI to 55% in CP and 49% in CE1). Conversely, the proportion of children who watch television in French (54% on average) increases from CI (slightly more than 48%) to CP (54%) and CE1 (61%).

2.3. EVALUATION PROTOCOL

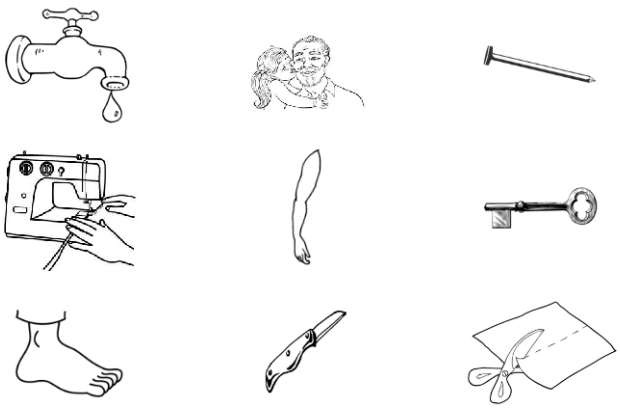
The vocabulary and reading tests developed for this study, all of which require individual testing, were developed in French but administered in the national language (except for the words to be assessed, which were given in French). It should be noted that, in order to know the impact of the initial level of oral vocabulary on subsequent reading ability, it would have been necessary to have information on these same abilities in the students' NL. The tests should therefore have been adapted to the three Senegalese NLs targeted by the study, which unfortunately we were unable to do for those assessing vocabulary.

2.3.1. The tests developed

2.3.1.1. Oral Vocabulary Level

The level of oral vocabulary was assessed by four tasks. The first test, as explained in the theoretical framework, is very often used with young children: the designation of the picture (among several) that corresponds to a word given orally by the person in charge of the experiment. The test developed for the present study contains 4 plates of 9 images presented successively, the pupil having to find the image corresponding to the word given orally: for example, the words "tap", then "arm", then "sewing" and finally "key" for the plate below (graph 2).

Figure 2: Example of the board used for the image designation in the test



The choice of words for this test was based on four sources of data: those of the PPVT (Peabody Picture Vocabulary Test for 2.5-6 year olds), those of the TVAP (Active and Passive Vocabulary Test for 3-5 year olds and 5-8 year olds)[25], the list of the most frequent words in French CP textbooks (according to Manulex) and the list of words included in the basic education curriculum of Senegal (Annex 2 of the curriculum). In addition to the criteria concerning the frequency of words, their selection was made in such a way as to include a few verbs (6), in addition to common nouns (16).

This test is presented in Appendices A1 (word category, frequency according to MANULEX, presence in PPVT 2-7 and/or TVAP 3-8) and B1 (instructions for test presentation, administration and coding, total = 22 points). It should be noted that, in order not to prolong this test unnecessarily for children with a very limited knowledge of the French language, a stopping criterion has been set for those who gave only one correct answer on the 5 items of the first picture sheet. Vocabulary level was also assessed by a task in which the child was asked to show parts of his/her body (nose, mouth, right hand). One point was awarded for each correct answer (i.e., 2 points when the child correctly showed his right hand). Another test of the same type involved performing simple actions (laughing, coughing) or more complex actions (drawing a line with the finger). A stop criterion was set after the first two items. This level was finally assessed by a production task: the reminder of the days of the week (What is the day after Monday? What is the day after Tuesday? etc.).

2.3.1.2. Pre-reading and reading level

To assess the impact of oral vocabulary on reading, data on children's reading levels must be collected. To quickly assess this level in children at the end of CP (or beginning of CE1), we developed for this study a one-minute-and-thirty-second aloud reading test. Since the initial target of this study is French, as L2, and three NLs from Senegal, the items are syllables (list 1), words from the target NLs (list 2), and French words frequently used in these NLs (list 3). These items are short (2 to 5 letters, 1 to 2 syllables) and regular in grapheme-phoneme correspondence. Most of the syllables are common to French and to the three target NLs of the study. For the youngest children (beginning CI and beginning CP), a syllable prereading test (vowel and consonant-vowel) has been developed. In order to allow for comparisons between the results of children at the three grade levels, four items are common to the pre-reading and reading tests. These two tests are presented in Appendices A3b and B3b.

2.3.2. The characteristics of the words chosen for the tests

The selected words belong to different grammatical categories: nouns, verbs and adverbs indicating a spatial relationship (front, back, near, far...), since spatial cues are essential for language comprehension. The selection of French words for these two series of tests was done in such a way as to:

. Avoid floor effects: given the children's grade level and the fact that French is, for most of them, a L2, the selected French words are among the most frequent in MANULEX CP level [26].

[25]. PPVT (Peabody Picture Vocabulary Test), Dunn, Thériault-Whalen & Dunn (1993); TVAP (Test of Active and Passive Vocabulary), Deltour & Hupkens (1980).
[26]. Manulex (cf. Lété, Sprenger-Charolles & Colé, 2004) is a database containing words from 54 French primary school textbooks, i.e. 48,900 spelling forms (*chantons*, *chanteraient*...; *bateau*, *bateaux*...) which corresponds to 23,900 "*lemmes*" (dictionary entries: *chanter*, *bateau*...).

. However, ensure a certain variability in their frequency (items of different levels of difficulty).
. Avoid ambiguous items, especially French words that have multiple meanings in children's NL.
. Do not include too many items containing phonemes specific to French (e.g., nasal vowels, the /y/ of "*lu*" and the /v/ of "*vol*")[27].

More precise indications on the items selected, as well as on the instructions for taking and scoring the tests, are presented in the appendix.

3. RESULTS

The rest of the report is devoted to the description and analysis of the results of the tests that were administered. The first part focuses on the results obtained on each item of the French oral vocabulary test, followed by the results of the pre-reading or reading test (Part 3.1). Since the information on the items is dense, it needs to be synthesized in order to highlight the students' scores in the two parts of the test (Part 3.2), and to analyze these scores in relation to the characteristics of the students and their family environment, as well as, for students enrolled in CP and CE1, the context and the teaching-learning activities they received in the year preceding the survey (Part 3.3).

3.1. THE RESULTS OBTAINED ON THE VOCABULARY AND READING TEST ITEMS

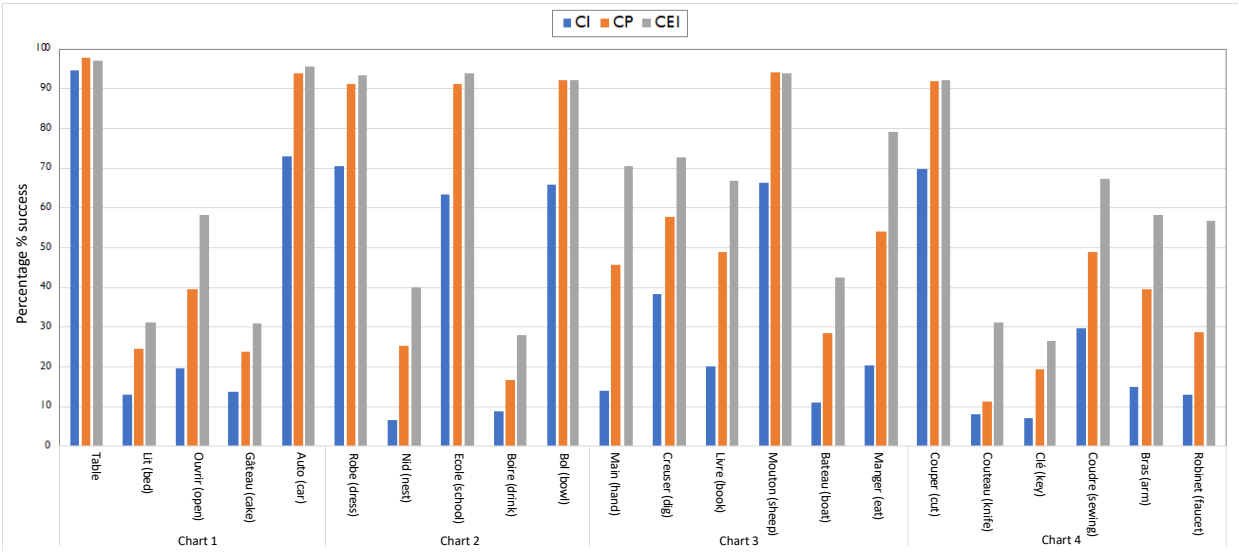
3.1.1. French Oral Vocabulary Tests

Four tests were developed and administered to the students: one test of image designation, two tests involving the performance of simple or complex actions, and one dealing with knowledge of the days of the week.

The picture designation test is presented in Appendices A1 (word category, frequency, presence in the PPVT 2-7 years old and/or TVAP 3-8 years old) and B1 (instructions for taking the test and its coding). As a reminder, in order not to prolong this test unnecessarily for children with only a limited knowledge of French, a stopping criterion has been set. The results are given in general terms in figure 3 below and presented in greater detail in tables 13, 14 and 15 below.

[27]. For differences between languages, we have consulted, among others, the "Word Atlas of Language Structure" (WALS https://wals.info/languoid/lect/wals_code_wlf).

Figure 3: Percentages of student success in the Picture Designation Test



Just under 24% of CI students do not go beyond the stop criterion, compared with less than 4% in CP and CE1. Very low percentages of correct answers (<10%) are only found in CI on 2 nouns (*nid, bras* - nest, arm) and 2 verbs (*coudre, boire* - sewing, drinking). This test is therefore kept without modification for subsequent analyses. It should also be noted that the 5 most successful words at all levels (*auto, livre, table, bol, robinet* - car, book, table, bowl, faucet), are not the most frequent in the Manulex database, which is surprising[28]. Two other words are added in CP (*école, robe* - school, dress) then three in CE1 (*main, bateau, manger* - hand, boat, eat)[29]. These data point to the need for word frequency tables in the children's NLs.

Table 13: CI students' results in the image designation test

Word	Success	Fail	NA	Total	% success
Chart 1					
Auto	368	16	4	388	94.8
Gâteau	50	299	39	388	12.9
Ouvrir	76	266	46	388	19.6
Lit	53	299	36	388	13.7
Table	28	98	7	388	72.9
Failure on 4 questions => stop for 91 students / 23.5%					
Chart 2					
Bol	274	23	0	297	70.6
Boire	25	243	29	297	6.4
École	246	48	3	297	63.4
Nid	34	230	33	297	8.8
Robe	256	36	5	297	66

(NA: No Answer)

Word	Success	Fail	NA	Total	% success
Chart 3					
Manger	54	223	20	297	13.9
Bateau	149	138	10	297	38.4
Mouton	78	207	11	297	20.1
Livre	258	36	3	297	86.9
Creuser	43	225	29	297	11.1
Main	80	201	16	297	20.6
Chart 4					
Robinet	271	26	0	297	69.8
Bras	31	242	24	297	8
Coudre	28	231	38	297	7.2
Clé	115	169	13	297	29.6
Couteau	57	226	14	297	14.7
Couper	51	222	24	297	13.1

[28]. Frequency order of these items out of the 22 in the test (according to Manulex, 2004, from most to least frequent): School (1096); Bed; Book (775); Open; Hand (538); Table (499); Cake; Cut; Drink; Sheep; Dress (285); Arm; Nest; Car (172); Key; Bowl (128); Boat (117); Eating (117); Knife; Sewing; Faucet (65); Digging. .

[29] It should be noted that these words are used as loan words from French in the three Senegalese languages pulaar, seerer and wolof. This may be an additional explanation for the fact that the children are familiar with these words.

Table 14: CP students' results on the Picture Designation Test

Word	Success	Fail	NR	Total	% success
Chart 1					
Auto	391	7	1	399	98.0
Gâteau	98	267	34	399	24.6
Ouvrir	158	200	41	399	39.6
Lit	94	268	37	399	23.6
Table	374	25	0	399	93.7
Failure on 4 questions => stop for 15 students / 3.8%					
Chart 2					
Bol	363	20	1	384	91.0
Boire	100	254	30	384	25.1
École	363	17	4	384	91.0
Nid	66	274	44	384	16.5
Robe	368	16	0	384	92.2

Word	Success	Fail	NA	Total	% success
Chart 3					
Manger	182	194	8	384	45.6
Bateau	231	143	10	384	57.9
Mouton	196	177	11	384	49.1
Livre	375	8	1	384	94.0
Creuser	114	241	29	384	28.6
Main	215	157	12	384	53.9
Chart 4					
Robinet	367	17	0	384	92.0
Bras	45	315	24	384	11.3
Coudre	77	275	32	384	19.3
Clé	195	181	8	384	48.9
Couteau	158	213	13	384	39.6
Couper	115	253	16	384	28.8

Table 15: CE1 students' results on the Picture Designation Test

Word	Success	Fail	NR	Total	% success
Chart 1					
Auto	384	11	1	396	97.0
Gâteau	124	248	24	396	31.3
Ouvrir	230	148	18	396	58.1
Lit	122	245	29	396	30.8
Table	379	14	3	396	95.7
Failure on 4 questions => stop for 14 students / 3.5%					
Chart 2					
Bol	370	12	0	382	93.4
Boire	159	206	17	382	40.2
École	371	11	0	382	93.7
Nid	110	244	28	382	27.8
Robe	365	15	2	382	92.2

Word	Success	Fail	NR	Total	% success
Chart 3					
Manger	279	99	4	382	70.5
Bateau	288	93	1	382	72.7
Mouton	265	112	5	382	66.9
Livre	372	10	0	382	93.9
Creuser	168	202	12	382	42.4
Main	314	63	5	382	79.3
Chart 4					
Robinet	366	16	0	382	92.4
Bras	123	240	19	382	31.1
Coudre	105	259	18	382	26.5
Clé	267	108	7	382	67.4
Couteau	231	146	5	382	58.3
Couper	225	146	11	382	56.8

In the second series of tests, the pupils had to perform actions: firstly, to show certain parts of their bodies, then in a second phase, to perform more complex actions. In the first test (Table 16 below), regardless of grade level, the highest scores were recorded for the right hand and mouth, followed by the nose and tongue and the lowest for the neck and elbow (less than 12% correct answers). Since these two items were not discriminating, they were eliminated from subsequent analyses.

Table 16: Student results on the Body Part Designation Test

	Correct answer	Partial answer	Wrong answer	No answer	Total	% success
CI						
Nez	37	-	230	121	388	9.5
Bouche	112	-	184	92	388	28.9
Tongue	32	-	254	102	388	8.2
Cou	5	-	246	137	388	1.3
Main droite	121	62	126	79	388	31.2
Coude gauche	6	6	275	101	388	2.0
Épaule droite	9	5	265	109	388	3.0
CP						
Nez	78	-	194	127	399	19.5
Bouche	186	-	143	70	399	46.6
Tongue	60	-	250	89	399	15.0
Cou	15	-	260	124	399	3.8
Main droite	234	94	41	30	399	58.6
Coude gauche	15	2	319	63	399	3.8
Épaule droite	33	4	277	85	399	8.3
CE1						
Nez	141	-	166	89	396	35.6
Bouche	264	-	74	58	396	66.7
Tongue	93	-	218	85	396	23.5
Cou	44	-	233	119	396	11.1
Main droite	254	92	39	11	396	64.1
Coude gauche	29	5	329	33	396	7.3
Épaule droite	46	7	287	56	396	11.6

In the second test (Table 17 below), only a few students were able to go beyond the stop criterion set after the first two actions: 17 in CI, 39 in CP and 63 in CE1. These results suggest that the students have only a limited understanding of oral French beyond the word. This finding is reinforced by the choice of the team, which considered it preferable to give each child the instructions (except the test word, or test words) in his or her NL. Consequently, the results of this second test were not taken into account in subsequent analyses.

Table 17: Students' vocabulary test results in action

	Correct answer	Wrong answer	No answer	Total	% success
CI					
Rire (*to laugh*)	4	96	288	388	1.0
Tousser (*to cough*)	13	87	288	388	3.4
Failure on 2 actions => stop for 371 students / 95.6%. Only 17 students were able to continue the test.					
CP					
Rire	17	116	266	399	4.3
Tousser	22	109	268	399	5.5
Failure on 2 actions => stop for 360 students / 90.2%. Only 39 students were able to continue the test.					
CE1					
Rire	37	121	238	396	9.3
Tousser	30	129	237	396	7.6
Failure on 2 actions => stop for 333 students / 84.1%. Only 63 students were able to continue the test					

The same applies to the last test, in which students had to name the days of the week. The results (Table 18 below) are not usable in further analyses for two reasons: on the one hand, more than 40% of CI students did not exceed the stop criterion, and on the other hand, the scores of those in CE1 were at the ceiling (91 to 95% correct answers).

Table 18: Students' results on the oral vocabulary test: days of the week

	Correct answer	Wrong answer	No answer	Total	% success
CI					
Monday	195	120	73	388	50.3
Tuesday	184	141	63	388	47.4
	Failure on 2 questions => stop for 160 students / 41.2%.				
Wednesday	150	69	9	228	38.7
Thursday	134	77	17	228	34.5
Friday	132	75	21	228	34.0
Saturday	172	46	10	228	44.3
CP					
Monday	347	39	13	399	87.0
Tuesday	333	48	18	399	83.5
	Failure on 2 questions => stop for 41 students / 10.3%.				
Wednesday	318	38	2	358	79.7
Thursday	312	39	7	358	78.2
Friday	302	42	14	358	75.7
Saturday	341	13	4	358	85.5

	Correct answer	Wrong answer	No answer	Total	% success
CE1					
Monday	377	13	6	396	95.2
Tuesday	367	19	10	396	92.7
	Failure on 2 questions => stop for 17 students / 4.3%.				
Wednesday	364	13	2	379	91.9
Thursday	365	11	3	379	92.2
Friday	361	13	5	379	91.2
Saturday	370	6	3	379	93.4

3.1.2. Pre-reading and reading tests

Student results in the pre-reading or reading tests are presented for CI and CP students in table 19 below, and for CE1 students in table 20 below. In CI, apart from <o>, <a> and <i>, the scores are very low, especially when reading a consonant-vowel item: only 5 to 6% of the students provide correct answers without the self-corrections, with no change when they are considered. In CP, these percentages are higher (40 to 64% without self-corrections, 44 to 65% with).

Table 19: Results of C1 and CP students in the pre-reading test

	Correct answer (CA)	CA after SC*	Wrong answer	No answer	Total	% success without SC	% success with SC
CI							
a	164	3	167	54	388	42.3%	43.0%
i	127	6	210	45	388	32.7%	34.3%
é	61	0	262	65	388	15.7%	15.7%
o	183	5	168	32	388	47.2%	48.5%
sa	22	3	280	83	388	5.7%	6.4%
la	22	0	275	91	388	5.7%	5.7%
dé	18	2	267	101	388	4.6%	5.2%
ti	24	0	285	79	388	6.2%	6.2%
CP							
a	359	5	31	4	399	90.0%	91.2%
i	347	7	38	7	399	87.0%	88.7%
é	277	9	101	12	399	69.4%	71.7%
o	381	4	13	1	399	95.5%	96.5%
sa	255	6	100	38	399	63.9%	65.4%
la	206	11	135	47	399	51.6%	54.4%
dé	160	14	189	36	399	40.1%	43.6%
ti	236	7	129	27	399	59.1%	60.9%

(SC: Self-Correction)

In CE1 (Table 20 below), the success percentages are higher than in CP (62-86% without self-corrections, 65-87% with). At this grade level, students also had to read invented two-syllable words as well as words from their NL or French. For the invented words, scores ranged from 46% to 65% without self-corrections (51% to 68% with), with the lowest score being on the longest word (*sabol*). For NL words, scores range from 52% to 66% without self-corrections (56% to 69% with) and for French words, scores range from 51% to 61% without self-corrections (53% to 63% with). Due to the small differences between the scores with and without self-corrections (from 1.5 to 5% with), the scores for French words range from 51% to 61% without self-corrections (53 to 63% with): 5% for the invented word *sabol* and 4% for *daba*, *bato* and *alima*, which are NL words, the French words being the ones with the lowest percentage of self-corrections: 1.5% for *kilo*, 2% for *ami*, *midi*, *moto*, *bal* and 3% for *mali*), subsequent statistical analyses were only carried out on the immediate responses.

Table 20: Results of CE1 students on the reading test

	Correct answer	Correct answer after SC	Stop after 30 seconds	Wrong answer	No answer	Total	% success without SC	% success with SC
sa	339	4	-	39	14	396	85.6%	86.6%
la	335	7	-	37	17	396	84.6%	86.4%
de	306	7	-	64	19	396	77.3%	79.0%
ti	320	8	-	54	14	396	80.8%	82.8%
al	246	13	-	100	37	396	62.1%	65.4%
fo	305	5	-	61	25	396	77.0%	78.3%

	Correct answer	Correct answer after SC	Stop after 30 seconds	Wrong answer	No answer	Total	% success without SC	% success with SC
tifo	253	10	-	81	52	396	63.9%	66.4%
lato	257	13	-	79	47	396	64.9%	68.2%
tafi	230	13	-	104	49	396	58.1%	61.4%
sabol	182	20	-	132	62	396	46.0%	51.0%
daba	207	16	23	108	42	396	52.3%	56.3%
oto	262	10	30	67	27	396	66.2%	68.7%
bato	216	16	45	82	37	396	54.5%	58.6%
foto	241	11	50	64	30	396	60.9%	63.6%
mati	259	7	55	50	25	396	65.4%	67.2%
alima	213	15	71	65	32	396	53.8%	57.6%
bal	208	9	77	66	36	396	52.5%	54.8%
ami	242	7	78	42	27	396	61.1%	62.9%
midi	216	9	93	45	33	396	54.5%	56.8%
kilo	204	6	101	53	32	396	51.5%	53.0%
moto	211	7	104	43	31	396	53.3%	55.1%
mali	208	12	108	36	32	396	52.5%	55.6%

3.2. VOCABULARY AND READING TEST SCORES

On the basis of the results obtained by the students in the different parts of the assessment protocol and in accordance with the explanations given in the previous section, several scores were constructed:

. For oral vocabulary in French:
  - An image designation score for students at each level;
  - A body part designation score (except "neck" and "elbow") for students at each level;
  - An overall score for oral vocabulary in French, based on the items making up the two previous scores, for students at each level;
. For pre-reading and reading (without taking into account self-corrections):
  - A pre-reading score for CI and CP students;
  - Four reading scores for second grade students:
    - A reading score of 10 invented words
    - A reading score of 6 words in NL
    - A reading score of 6 words in French
    - An overall reading score
  - A pre-reading score on the four questions ("sa", "la", "dé", "ti") common to all three levels.

In concrete terms, the construction of a score summarizing the performance of the students in each of the domains of the test was done according to two methods: (i) the first consists in directly summing up all the scores on the various items making up a domain and using this "additive score" as an overall performance; (ii) the second consists in conducting a factorial analysis on the various items concerning the same domain of acquisition and using the first axis of this analysis as a latent variable to characterize this thematic overall performance ("factorial score"). The correlation analyses between these two types of scores reveal the existence of

similarities for each of the domains treated in the three levels. While the more intuitive additive scores are used to present students' results, the factor scores are used for the other analyses for the sake of reliability and comparability (they have been standardized with a mean of 100 and a standard deviation of 15).

3.2.1. Oral vocabulary in French

The level of students' oral French vocabulary is determined by their results on items in the Picture and Body Part Designation tests. Graph 4 below provides descriptive statistics for the three classes on the image designation test. The interpretation of these graphs (referred to as the mustache box) is from bottom to top: For each score, (i) a first check mark indicates the minimum value of the distribution, (ii) a line at the bottom of the box gives the position of quartile 1 (25% of the distribution), (iii) a line in the middle of the box gives the median (the value that divides the distribution into two equal parts), (iv) a line at the top of the box indicates where quartile 3 (75%) is located, and (v) a last check mark indicates the maximum value of the distribution. Finally, the circles identify extreme values, 1.5 to 3 box lengths apart. The greater the dispersion of the distribution, the wider the box and the whiskers.

Figure 4: Description of image designation scores

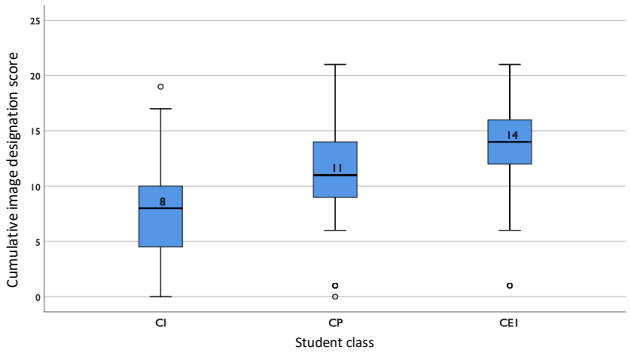
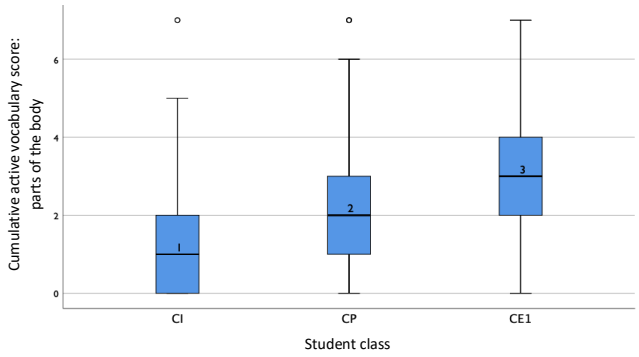


Image designation score			
	CI	CP	CE1
Average	7.3	11.4	13.6
Standard deviation	4.3	3.6	3.9
Min-Max	0-19	0-21	0-21
Percentiles			
25	4.3	9	12
50	8	11	14
75	10	14	16

The score for image designation is higher as you move up through the levels. Indeed, the average student score is 7 in CI, 11 in CP and 14 in CE1. Moreover, on the one hand, the lowest 25% scored between 0 and 4 in CI, between 0 and 9 in CP and between 0 and 12 in CE1; on the other hand, the circles in the graph indicate that in CP and CE1, only a few students scored really low. Conversely, the 25% of students who scored the best in this part of the test had scores between 10 and 19 in CI (19 for only two students), between 14 and 21 in CP and between 16 and 21 in CE1.

The same trend is found for the body part designation test (graph 5 below). The averages range from 1 in CI, to 2 in CP and 3 in CE1. The variability is lower than for the image designation test (scale between 0 and 7). The score of the 25% of the worst students is 0 in CI, between 0 and 1 in CP and between 0 and 2 in CE1. At the other extreme, among the 25% with the best results, the score is between 2 and 7 in CI, between 3 and 7 in CP and between 4 and 7 in CE1.

Figure 5: Description of scores for naming parts of the body



Scores for naming parts of the body			
	CI	CP	CE1
Average	1.3	2.4	3.0
Standard deviation	1.4	1.5	1.6
Min-Max	0-7	0-7	0-7
Percentiles			
25	0	1	2
50	1	2	3
75	2	3	4

Based on these two tests (naming images and parts of the body), we've built two overall vocabulary scores, an additive score and a score factor (using the procedure introduced in this section). Before looking at the students' scores, it is useful to examine if the students' scores obtained in one part of the test are linked to those obtained in the other part. For example, was a student who succeeded with the image naming tasks equally successful in naming body parts? This could be understood by analyzing the correlation[30] between the scores (factors) obtained in both parts of the test and overall. The following Table 21 provides this information. The figures in the light blue cells show that relationships between the scores obtained in the two parts of the test are, at all grades, strong overall: students who obtained the best scores in one part of the test mostly obtained the best results in the other (the reverse was also true: students who were less successful in one part of the test were also less successful in the other part). The fact that the coefficients do not exceed 0.50 does however signal that the two parts of the test do not evaluate exactly the same competencies. It should also be noted that the coefficients rise over time, particularly from CP to CE1: the results on both parts of the test thus tend to be more homogeneous in CE1 than in CP and in CI. Finally, the correlations between the scores on both parts of the test and the overall score (in dark blue in the table below) show that the image naming section of the test is the one that, at all three grades, provides the greatest contribution to the statistical definition of the overall vocabulary score; the weight of the students' results for the body part naming section does however increase between CI and CE1.

Table 21: Correlations between scores (factors) obtained in vocabulary tests

Table 22:

	Naming images	Naming body parts	Overall vocabulary score
CI			
Image naming score	1	0.38	0.99
Naming body parts score	-	1	0.50
Overall vocabulary score	-	-	1
CP			
Image naming score	1	0.39	0.98
Naming body parts score	-	1	0.56
Overall vocabulary score	-	-	1

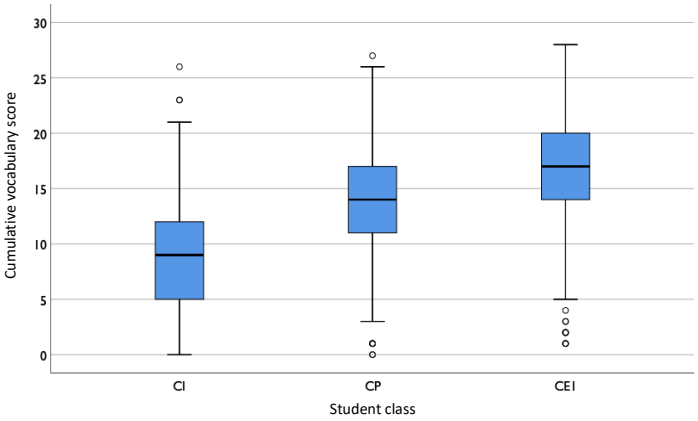
[30]. Only the significant variables were retained in the models and groupings of multiple modalities of variables were created where this proved to be relevant, namely when several modalities of a variable manifested, in a previous specification, statistically comparable behavior (both in their meaning and magnitude). This applies to all the models in this study.

	Naming images	Naming body parts	Overall vocabulary score
CE1			
Image naming score	1	0.46	0.98
Naming body parts score	-	1	0.61
Overall vocabulary score	-	-	1

(All coefficients are significant at a threshold of 0.001)

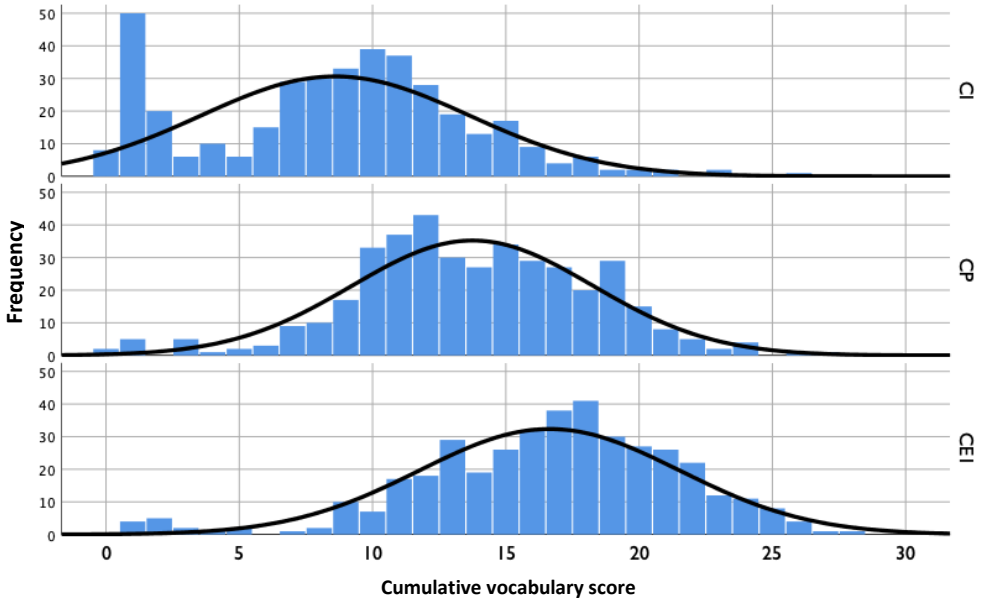
Figures 6 and 7 hereafter present descriptive statistics and the breakdown of the overall vocabulary score, broken down for each grade. Logically, we find the same trends as in the previous analyses: the higher the grade, the higher the oral vocabulary score in French. Indeed, the average score rises from 9 in CI, to 14 in CP and to 17 in CE1. Furthermore, in CI the 25% of least accomplished students obtained a score of between 0 and 5 (with, as shown by Figure 6, a high proportion of students scoring 1), in CP, they scored between 0 and 11, and in CE1, between 1 and 14 (in CP and in CE1, only a few students have very low scores). Conversely, the top 25% of students had scores varying between 12 and 26 in CI (very few students scored over 19), 17 to 27 in CP, and 20 to 28 in CE1.

Figure 6: Description of overall vocabulary score



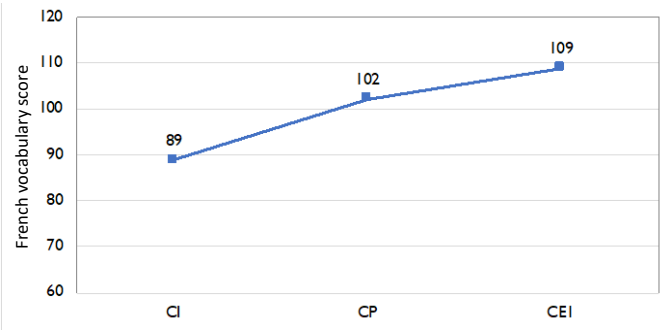
Overall vocabulary score			
	CI	CP	CE1
Average	8.6	13.7	16.6
Standard deviation	5.1	4.5	4.9
Min-Max	0-26	0-27	1-28
Percentiles			
25	5	11	14
50	9	14	17
75	12	17	20

Figure 7: Breakdown of student scores across three grades



Until now, we've looked at the scores obtained by students in a very broad way, and have highlighted the fact that their level of French vocabulary increases when the higher levels of education are considered. Insofar as the data concerns a sample of students and not an entire population, we should go further in our analysis and examine if the difference between the level of oral vocabulary in French according to the class in which the students are educated that we have observed is (statistically) significant, and if it is, to identify to what degree. To do this, we built a regression model in which the variable to be explored is the score obtained in French oral vocabulary (created based on a standardized factor analysis with an average of 100 and a standard deviation of 15), and the explanatory variables are the class in which the students are currently educated (CI, CP or CE1), as well as their characteristics and those of their family milieu (which here serve as control variables, due to the students with "otherwise equal" characteristics). The estimates provided by the model indicate that there is a significant difference in the French oral vocabulary score obtained by the students according to the class in which they are educated. To illustrate its magnitude, we have estimated, based on the results of the model, the average scores obtained by the students in CI, CP, and CE1 in the French oral vocabulary test. There are presented in Figure 8 below.

Figure 8: Average scores in oral French vocabulary by student class



We can observe a growing relationship between students' level of French oral vocabulary and the class in which they are educated. The difference in level ranges from 13 points between CI and CP and to 7 points between CP and CE1 (thus 20 points between CI and CE1, more than a single standard-deviation). Therefore, it is during the course of the first primary year that the level of oral French vocabulary increases the most (without being able to link this increase to any factor at this stage).

3.2.2. Pre-reading and reading

The level of reading was evaluated through various means depending on the class in which the students were educated. Those in CI and CP took a pre-reading test, while those in CE1 took a reading test, with four items (*sa, la, dé* and *ti*) common to both tests. Table 22 below provides the breakdown of the pre-reading scores for students in CI and CP.

Table 23: Breakdown of pre-reading scores for students in CI and CP

	CI		CP	
	N	%	N	%
0	130	33.5%	8	2.0%
1	106	27.3%	7	1.8%
2	64	16.5%	20	5.0%
3	35	9.0%	53	13.3%

	CI		CP	
	N	%	N	%
4	29	7.5%	51	12.8%
5	5	1.3%	38	9.5%
6	3	0.8%	45	11.3%
7	5	1.3%	65	16.3%
8	11	2.8%	112	28.1%
Total	388	100.0%	399	100.0%
Average	1.6	-	5.6	-
Standard deviation	1.9	-	2.2	-

In CI, a third of students read no items on the pre-reading test, 27% read only one and 16% read only two. In total, over three quarters (77%) of students had a very limited pre-reading level. In CP, only 9% did, while 44% read all or almost all of the items. Alongside this, we also sought to understand if the difference observed in the pre-reading scores of CI and CP was significant. The estimates provided by a regression model designed to explain the pre-reading score obtained by the class and characteristics of students and their family milieu, indicate that this is the case, with the average difference in French oral vocabulary score between CI and CP amounting to 22 points (more than one standard deviation).

In CE1, the level of reading was assessed by the scores obtained (i) out of ten invented words, (ii) out of six words in NL, (iii) out of six words in French and (iv) overall. Table 23 hereafter provides the scores for these three sub-lists. The lowest percentage of students who read less than half of the items is shown by sub-list 1, which contains the invented words: 21%, compared to 25% and 41% for sub-lists 2 and 3, which contain the words in NL and in French respectively (which are however longer on average than those on the list of invented words). The difference is minimal with regard to those who read all, or almost all, the items on these three sub-lists (48%, 49%, and 47% for sub-lists 1, 2 and 3 respectively).

Table 24: Breakdown of CE1 scores on the different sections of the reading test

10 invented words		
	N	%
0	30	7.6%
1	15	3.8%
2	14	3.5%
3	13	3.3%
4	13	3.3%
5	29	7.3%
6	21	5.3%
7	33	8.3%
8	37	9.3%
9	69	17.4%

6 words in NL		
	N	%
0	95	24.0%
1	24	6.1%
2	20	5.1%
3	16	4.0%
4	47	11.9%
5	66	16.7%
6	128	32.3%

6 words in French		
	N	%
0	126	31.8%
1	21	5.3%
2	14	3.5%
3	23	5.8%
4	27	6.8%
5	47	11.9%
6	138	34.8%

10	122	30.8%
Total	396	100.0%

Total	396	100.0%

Total	396	100.0%

Alongside this, we also sought to understand if, on average, the differences in the scores obtained by students on the three sub-lists of items are significant. Analyses carried out based on the three scores (presented on a scale from 0 to 100; table 24 below) indicate that it is the case and that the invented words are on average clearly better read than the others, with the words in NL being slightly better read than those in French.

Table 25: Comparison of average CE1 scores on different parts of the reading test

	Average	Difference	
		With the score for the 10 invented	With the score for the 6 words in NL
Score (out of 100) for reading the 10 invented words	70.0	-	-
Score (out of 100) for reading the 6 words in NL	58.8	+ 11.2	-
Score (out of 100) for reading the 6 words in French	54.3	+ 15.8	+ 4.6

(Differences are significant at a threshold of 0.001)

However, six of the ten invented words are shorter than the words in NL and French (they are one syllable, compared to two for the others) which could explain the fact that students obtained a better score on these words. To verify this supposition, we compared the averages of the scores consisting of all items of the same length (Table 25 hereafter). The analyses reveal that, at equivalent length, the difference between the scores of the four invented words and the fix words in NL is not significant; it is in fact between these two scores and those of the French words. In addition, on average, the students read the invented words and the NL words better than the words in French (the difference amounts respectively to 4 and 5 points on a scale of 100).

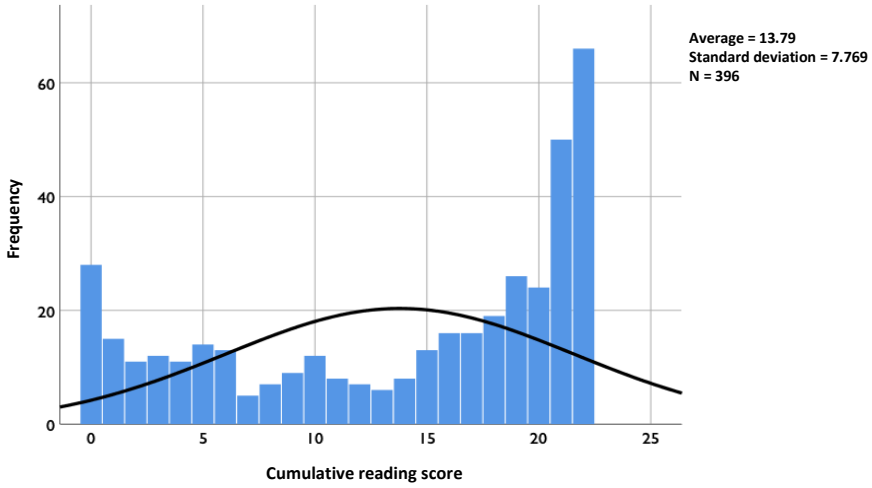
Table 26: Comparison of average CE1 scores on different parts of the reading test of the same length (two syllables)

	Average	Difference	
		With the score for the 6 invented	With the score for the 6 words
Score (out of 100) for reading the 6 invented words	58.2	-	-
Score (out of 100) for reading the 6 words in NL	58.8	ns	-
Score (out of 100) for reading the 6 words in French	54.3	3.9 **	4.6 ***

The significance thresholds are as follows: ns - not significant; * = significant at the threshold of 0.05; ** = significant at the threshold of 0.01 and *** = significant at the threshold of 0.001. This scoring is used throughout the report.

By combining these three scores into an overall score, we can see great variability in the students' level of reading (Figure 9 below): while the average score is 14, the 25% lowest were able to read only 6 words of the reading test, while the 25% highest read all or almost all of the words.

Figure 9: Breakdown of the CE1 student reading scores



And finally, we examined if the scores obtained in one part of the reading test were linked to the two on the other sections. The following Table 26 provides this information.
The correlations between these three reading sub-tests taken in CE1 are very high, from 0.76 to 0.84. The highest were between the NL words and the invented words (0.84), or those in French (0.83) and the lowest were between the French words and the invented words (0.76). These results suggest that students at this academic level largely use one procedure (decoding) to identify words.

Table 27: Correlation between the CE1 student scores on three sections of the reading test

	Score for the 10 invented words	Score for the 6 words in NL	Score for the 6 words in French	Overall reading score
Score for the 10 invented	1	0.837	0.761	0.937
Score for the 6 words in NL	-	-	0.827	0.946
Score for the 6 words in	-	-	-	0.917
Overall reading score	-	-	-	1

(All coefficients are significant at a threshold of 0.001)

Up until now, we considered students' pre-reading or reading level separately for each grade. As the CI and CP students took one test, and the CE1 students another, it is not possible to compare the results we will present. We do however have results which we obtained for four items common to all three grades *(sa, la, dé, ti)*. The breakdown of this score by grade is provided in table 27 below.

Table 28: Breakdown of the score on the four items common to all three grades

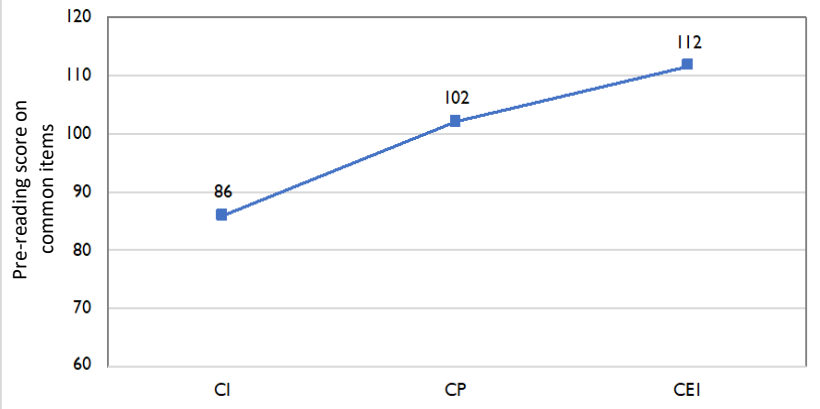
	CI		CP		CE1	
	N	%	N	%	N	%
0	351	90.5%	104	26.1%	33	8.3%
1	17	4.4%	53	13.3%	20	5.1%
2	3	0.8%	44	11.0%	21	5.3%
3	5	1.3%	76	19.0%	50	12.6%
4	12	3.1%	122	30.6%	272	68.7%

	CI		CP		CE1	
	N	%	N	%	N	%
Total	388	100.0%	399	100.0%	396	100.0%
Average	0.2	-	2.1	-	3.3	-
Standard deviation	0.8	-	1.6	-	1.3	-

The scores obtained by the students contrast greatly according to grade. On entry into CI, 90% of students fail to read the four syllables shown to them, and 4% read only one; thus only 6% of students are able to read between two and four syllables on the test. On entry into CP, while only just over a quarter (26%) of students read no syllables and 13% read only one, 11% are able to read two, 19% three, and 31% all syllables on the test. And finally, on entry in CE1, a little over two thirds of students (69%) succeeded in reading the four syllables on the test and 13% read three; 19% of students read less, and among them, 8% are unable to read any syllable on the test.

Based on these results, we sought to understand if the difference observed between the grades is significant, and if so, to what degree. The estimates provided by a regression model designed to explain the score obtained on the four shared items by class (standardized with an average of 100 and a standard deviation of 15) and by the characteristics of students and their family milieu, indicate that this is the case. According to Figure 10 below, which provides an estimate of the average score obtained by students of each grade, we can see a difference of 16 points (a little more than the standard deviation) between CI and CP students and a difference of 10 points between CP and CE1 students.

Figure 10:Estimated pre-reading scores by student class for the shared items



In summary, the average French oral vocabulary score of the students (standardized with an average of 100 and a standard deviation of 15) increases on average in accordance with the class grade. The difference amounts to 13 points between CI and CP (almost one standard deviation) and to 7 points between CP and CE1. The same applies for the reading of the items common to the various grade levels, the difference being 16 points (a little more than one standard deviation) between CI and CP and 10 points between CP and CE1. Therefore, it is during the course of the first primary year that the level of oral French vocabulary and reading (decoding/word identification) increases the most. Finally, comparing the three sub-lists in the reading test taken in CE shows that the invented words are not better read than words in the

NL, with these two types of items being themselves significantly better read than the words in French. These results indicate, on the one hand, that CE1 students likely use the same procedure (decoding) to read the invented words and common words from their NL, and on the other hand, that they read common words in their NL better than those in French.

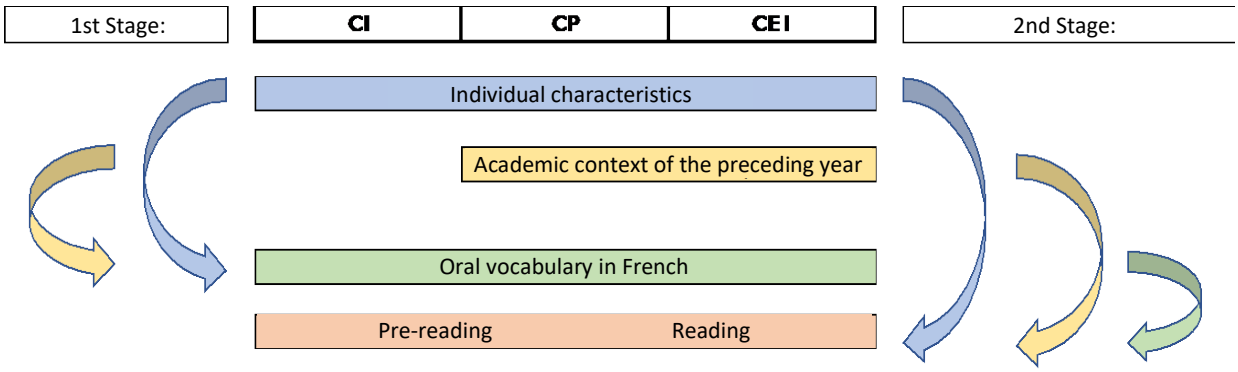
3.3. EXPLAINING THE VARIABILITY OF STUDENTS' SCORES

3.3.1. Analytical method

The aims of this study are twofold: (1) to understand the degree of oral French vocabulary held by students on entry to school and in the first years of school; (ii) operationally, to define the timing and methods for introducing French, both from a quantitative (amount of time dedicated) and qualitative (content of activities) perspective, and thus support the Ministère de l'Education Nationale (MEN) in finalizing the bilingual teaching of reading model which is currently under development. While the first section of the study evaluated the level of French oral vocabulary and pre-reading or reading level of students in CI, CP and CE1, this section aims to respond to the second objective.

To define the timing and means for introducing French, and knowing that the acquisition of vocabulary is fundamental for developing language skills and ultimately, for learning to read, two avenues of analysis are planned (Figure 11).

Figure 11:Presentation of avenues of analysis



The first avenue aims to explain the variability between the levels of oral French vocabulary among students, using the following factors:

- The characteristics of students, as well as their family milieu: we will examine if there are disparities in the level of oral French vocabulary in students according to their characteristics and measure to what degree;
- For CP and CE1 students, the context and teaching and learning activities which they experienced in the year prior to the study, knowing that there could be differences in:
    - How classes were organized, in terms of class size, the possible implementation of a specific bilingual system, the availability of textbooks, the length of the school year and even the characteristics of the teacher, regardless of their formal characteristics (status, experience, academic training, etc.) or the perceptions they have of their level of comfort with French;

- The time and content of activities dedicated to the teaching of oral French vocabulary, which will make it possible to identify (i) if there is an optimal amount of time which should be dedicated to teaching oral French vocabulary and what this amount of time is, and (ii) if there are different types of activities which support the learning of oral French vocabulary and what these activities are.

The second part aims to explain the variability in the pre-reading or reading level of students, using the same factors as previously:

. The characteristics of students, as well as those of their family environment;
. Students' level of oral French vocabulary, in order to, firstly, analyze if, and to what degree, this level has an effect on their level of pre-reading and, secondly, to identify the minimum level of vocabulary needed for optimal learning to read.
. For CP and CE1 students, the context and teaching and learning activities which they experienced in the year prior to the study, knowing that there could be differences in:
  - The way classes were organized, looking at the same aspects mentioned earlier;
  - The time and content of activities dedicated to the teaching of pre-reading or reading, to identify (i) if there is an optimal amount of time which should be dedicated to teaching pre-reading or reading and what this amount of time is, and (ii) if there are different types of activities which support the learning of pre-reading or reading and what these activities are.

3.3.2. Results of the oral French vocabulary test

3.3.2.1. By student characteristics and their family environment

In seeking to explain the variation in the level of students' oral French vocabulary, the first avenue of analysis will examine if there are disparities in the level of oral French vocabulary in students according to certain characteristics of students and their environment, and measure to what degree. We have thus built a regression model for each grade, in which the variable to be explored is the score obtained in French oral vocabulary (created based on a standardized factor analysis with an average of 100 and a standard deviation of 15), and the explanatory variables are the characteristics of students, as well as those of their family environment. Table 28 hereafter presents the results of these models for the three grades[31].

Table 29: Regression analyses of students' oral French vocabulary score of according to certain social variables

Variable	Modalities	CI	CP	CE1
Constant		62.76 ***	82.70 ***	90.56 ***
Location	Rural	ref.	ref.	ref.
	Urban	8.84 ***	8.67 ***	7.51 ***
Gender	Girl	ref.	ref.	ref.
	Boy	-0.35 (ns)	2.90 *	1.50 (ns)
Age (in years)		2.70 ***	1.05 (ns)	0.59 (ns)
Pre-schooling	No	-	ref.	-
	Daara			

[31]. Only the significant variables were retained in the models and groupings of multiple modalities of variables were created where this proved to be relevant, namely when several modalities of a variable manifested, in a previous specification, statistically comparable behavior (both in their meaning and magnitude). This applies to all the models in this study.

Variable	Modalities	CI	CP	CE1
	Other types		7.66 ***	
Sociocultural family situation	80% of the most	ref.	ref.	ref.
	20% of the most	4.91 **	3.42 *	4.47 *
Degree of proactiveness in reading, speaking, and learning French words	None	ref.	ref.	ref.
	One activity	3.71 *	3.68 **	
	Two activities		3.85 **	
	Three activities	6.27 *		6.36 ***
Watching TV in French	No	ref.	ref.	-
	Yes	6.13 ***	3.75 *	
R^2		26.7%	21.3%	10.1%

The significance thresholds are as follows: ns - not significant; * = significant at the threshold of 0.05; ** = significant at the threshold of 0.01 and *** = significant at the threshold of 0.001.

Firstly, it appears that, based on the share of variance (R^2) explained by the characteristics of the students and their family environment in the three models presented, the students' level of oral French vocabulary is quite low depending on the social and geographical context in which they live. This amounts to 27% in CI, 21% in CP, and 10% in CE1. The fact that the R^2 values lower when looking at the highest levels suggests that the influence of students' characteristics and their family environment on their level of oral French vocabulary weakens the further the students' progress through the education system. It is therefore important to look for factors other than those considered here to explain the variation in the level of oral French vocabulary.

Among the characteristics of the students and their family environment which help explain the variability in students' performance in the test, the geographic location, indicated by the residential milieu[32], is the characteristic which makes the most difference to students' level of vocabulary, regardless of the class in which they are educated. As such, we can see that students living in an urban milieu obtained an average score greater by 8 to 9 points than those living in rural milieus.

Regarding the characteristics of the students themselves, we find quite contrasting results depending on the variable in question. As such, while the gender of the child had no significant impact on their level of vocabulary in CI and CE1, it made a difference (of almost 3 points) in CP. Conversely, age introduces differences in CI, with the level of oral French vocabulary increasing (by around 3 points per year) as the children grow, but not in CP or CE1. Attendance at pre-school also improved students' level of oral French vocabulary, but only in CP and when they had attended a type of preschool other than a *daara*[33]. They thus obtained a score almost 5 points higher than those who had not attended pre-school and those who had attended a *daara*.

With regard to family environment and more specifically, the family sociocultural situation (which groups based on a factor analysis of the parents' level of instruction, their reading knowledge, and their profession), we might have thought that students' level of oral French vocabulary would increase in a linear fashion when considering the most advantageous sociocultural situations. It seems that this is not the case: only students coming from the most

[32]. While there is a strong collinearity between residential milieu and area of residence (Gossas, Kaffrine and Kaolack Commune IEFs) and considering the fact that the urban milieu generally offers a more literate environment than the rural milieu (which can influence students' level of vocabulary), we chose to retain only milieu of residence in the model.

[33]. This includes attendance at a public, private, or community preschool. It was not possible to isolate these different types of preschool due to the low number of students who had attended them.

advantaged families in this regard had a better level of vocabulary than all others (score higher by 5 points in CI and in CE1 and 3 points in CP).

We find a better level of oral French vocabulary among students who have activities such as speaking in French, learning French words and reading in French with someone from their immediate community (this person does not necessarily need to be the parents[34]). As such, students' level of vocabulary improves by 4 to 7 points according to grade and the number of activities the students took part in.

We can see a positive relationship between students' level of oral French vocabulary and the fact that they watch French-language programs on television in CI (+6 points); this relationship reduces in CP (+ 3 points) and completely fades away for students in CE1.

Finally, we note that certain dimensions were integrated into the models, without their addition making any significant difference to the students' results. This is especially the case with the number of languages spoken by students in their daily life[35]. As such, living in a monolingual or bi/multilingual environment does not account for the differences between students in their level of oral French vocabulary.

3.3.2.2. By students' school experience in the year preceding the study

To analyze the variability in students' level of oral French vocabulary in CP and CE1, we have, in addition to their characteristics and those of their family environment, a certain amount of information on their school experience in the year preceding the study (when they were in CI and CP respectively). Before conducting these analyses, first we will describe the structure of the classes in which the students were educated in the year preceding the study (2017-2018), and the time and content of the activities dedicated to oral French vocabulary that they experienced.

Description of students' school experience in 2017-2018:

Thanks to the questionnaires conducted with the teachers of these classes, we have a large amount of information on the characteristics of classes, the characteristics of teachers, the languages used in the school context, and the time and content of activities used by the teacher. These elements are examined successively.

Class characteristics:

The first piece of information concerns the size of the classes in which the students were educated in the year preceding the study. Table 29 below provides the number of students per class, broken down by grade.

Table 30: Breakdown of classes by size

Class size	CI		CP		Overall	
	N	%	N	%	N	%
< 20	11	28.2%	12	30.0%	23	29.1%

[34]. Variables reflecting such interactions between parents and their child were introduced in the models tested previously, without making a significant difference. These activities are thus beneficial for the child, regardless of the person performing them.

[35]. It was not possible to distinguish students by the language they speak (monolingual Wolof, Pulaar or Serer) as the number of students speaking only one of these three languages was too low. Consequently, only the monolingual versus monolingual context was introduced into the model, and made no significant difference.

Class size	CI		CP		Overall	
	N	%	N	%	N	%
21-30	6	15.4%	9	22.5%	15	19.0%
31-40	7	17.9%	8	20.0%	15	19.0%
41-50	7	17.9%	2	5.0%	9	11.4%
51-60	4	10.3%	5	12.5%	9	11.4%
> 60	4	10.3%	4	10.0%	8	10.1%
Total	39	100.0%	40	100.0%	79	100.0%
Average	39	-	34	-	36	-
Minimum	14	-	9	-	9	-
Maximum	124	-	108	-	124	-

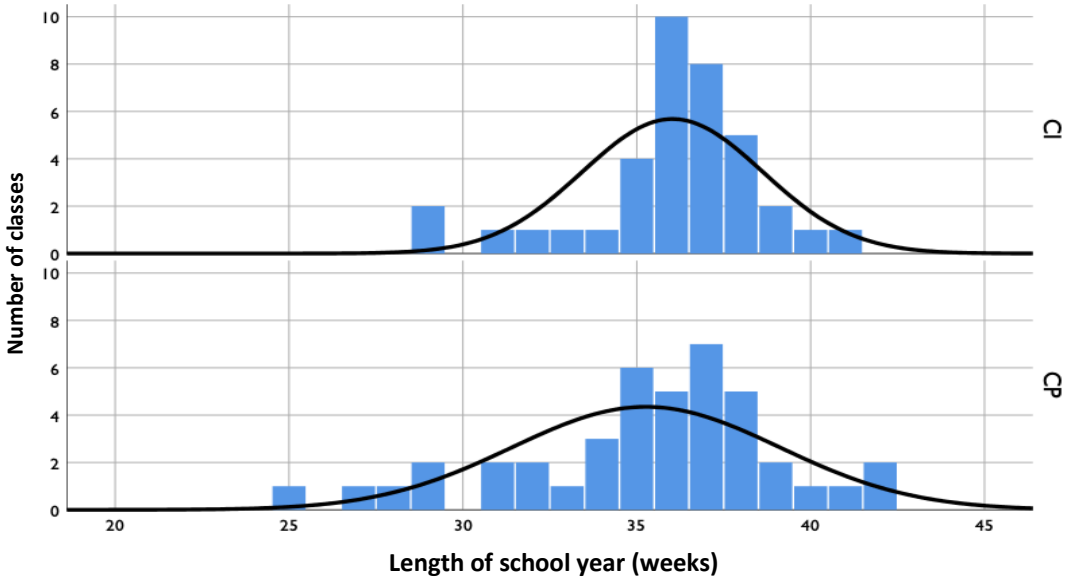
In CI, while the number of students per class was 39 on average, it varied from between 14 to over 100 students, and a little over a quarter (28%) of classes had fewer than 10 students, 15% had between 21 and 30, and 20% over 50. In CP, the average number of students per class is a little lower (36 students as opposed to 39) and class sizes varied a little less: 30% of classes had fewer than 20 students, 19% between 21 and 30, and 21% over 50.

Time is an essential component of learning. It is trite to say so, but learning takes time. To tackle this question, the teachers were asked about the start and end dates of the school year. Based on this, we calculated the number of weeks included in the 2017-2018 school year. The information is given in Table 30 below and Figure 12.

Table 31: Start, end, and length of the school year

	CI			CP		
	Average	Minimum	Maximum	Average	Minimum	Maximum
Beginning of school year	10/20/2017	10/03/2017	01/03/2018	10/24/2017	10/04/2017	01/02/2018
End of school year	07/01/2018	06/12/2018	07/31/2018	07/02/2018	06/12/2018	07/31/2018
Length of school year	36	29	41	35	25	42

Figure 12:Breakdown of classes by length of school year (in weeks)



We find quite similar tendencies in both CI and CP classes. While on average the school year begins on around October 20, in reality this varies from the beginning of October and the beginning of January the following year. On average, the school year ends at the beginning of July, but one school ended in mid-June and the other at the end of July. The differences between the classes, both at the beginning and end of the school year, are considerable. Indeed, while among CI classes the school year lasted for 36 weeks on average, in reality it varied from 29 to 41 weeks. The difference is even greater between CP classes: the school year lasts for 35 weeks on average but in fact lasted only 25 weeks for one class and 42 weeks for another.

The time in school may also vary throughout the school year. Teachers were thus asked if, excluding school holidays, if there had been interruptions to activities during the 2017-2018, and if yes, how long these had lasted for. Their answers are in Table 31. As previously, the trends are quite similar in CI and CP. In around a third of classes, activities were never interrupted except for scheduled school holidays. In the other two thirds, interruptions took place: they lasted less than 15 days in 19% of classes, between 15 days and a month in 23% of classes, between one and two months in 14%, and over two months in 11%.

Table 32: Breakdown of classes by frequency of interruptions during the year

Frequency of interruptions	CI		CP		Overall	
	N	%	N	%	N	%
Never	12	30.8%	14	35.0%	26	32.9%
< 15 days	8	20.5%	7	17.5%	15	19.0%
15 days to 1 month	10	25.6%	8	20.0%	18	22.8%
1 to 2 months	4	10.3%	7	17.5%	11	13.9%
> 2 months	5	12.8%	4	10.0%	9	11.4%
Total	39	100.0%	40	100.0%	79	100.0%

Teachers were also asked about the availability of French textbooks and exercise books (Table 32 below). In CI, while the great majority of classes (84%) had a French textbook (this textbook

was shared between two students in 19% of classes and between three or more students in 5%), "only" 41% had an exercise book (which was shared between two students in 10% of cases). In CP, 80% of classes had a French textbook (shared between two students in 15% of classes and between three or more students in 5%). As previously, "only" 40% had exercise books. Note that all teachers (except 1 in CI) said they use the textbook and exercise book.

Table 33: Breakdown of classes by availability of French textbooks and exercise books

Availability of textbooks and exercise books	CI				CP			
	French textbook		Exercise book		French textbook		Exercise book	
	N	%	N	%	N	%	N	%
Yes, 1 per student	24	64.9%	12	30.8%	24	60.0%	12	30.0%
Yes, 1 for 2 students	7	18.9%	4	10.3%	6	15.0%	4	10.0%
Yes, 1 for 3 or more students	2	5.4%	0	0.0%	2	5.0%	0	0.0%
No	6	16.2%	23	59.0%	8	20.0%	24	60.0%
Total	37	100.0%	39	100.0%	40	100.0%	40	100.0%

***In summary**, class size varies from less than 10 students to over 100 in CI (39 students on average) and less than 20 to over 60 in CP (36 on average). The length of the school year also varies greatly between classes, from 29 to 41 weeks, with an average of 36 in CI and from 25 to 42 weeks, with an average of 35, in CP. The same applies for the duration of interruptions during the school year, also with similar trends in CI and CP: around a third of classes had no interruption during the year (excluding school holidays). For the remaining two thirds, the school year was interrupted for less than 15 days, and from one month to over two months in 19% and 25% of classes respectively. With regard to classroom materials (French textbook and exercise book), textbooks were present in 84% of classes in CI and in 80% of CP classes but shared between 2-3 students in 20% to 24% of cases (24% in CI and 20% in CP). All teachers (except 1) say they used textbooks. Only 40% of classes had an exercise book (shared in 10% of cases).*

We have a certain amount of information on teachers (their gender, language, status, qualifications, years of experience, and their level of initial and continuous training). Table 33 hereafter provides the breakdown of teachers by gender and native language and the classes they led in 2017-2018.

Table 34: Breakdown of teachers by certain personal characteristics

	CI		CP		Overall	
	N	%	N	%	N	%
Number of teachers	39	-	40	-	79	-
Gender						
Male	21	53.8%	21	52.5%	42	53.2%
Female	18	46.2%	19	47.5%	37	46.8%
Native language						
Pulaar	6	15.4%	3	7.5%	9	11.4%
Seereer	13	33.3%	10	25.0%	23	29.1%
Wolof	18	46.2%	21	52.5%	39	49.4%
Other	2	5.1%	6	15.0%	8	10.1%

In CI and CP, there are slightly more men than women (53% versus 47%). Almost half have Wolof as their native language, a little over a quarter (29%) Seereer (33% in CI and 25% in CP), 11% Pulaar (15% in CI and 7% in CP) and 10% a language other than the three mentioned (5% in CI and 14% in CP).

The data on the status, qualifications (university and professional), number of years of experience and participation in continuous training are presented in Table 34. Almost two thirds of teachers are civil servants (a third are thus contract), with civil servants being more numerous in CP than in CI (69% compared to 57%). While the number of years of experience was 8 to 9 years on average, in reality it varies between 1 and 20 or 21 years. More specifically, the number of years of experience is, for a little over a quarter of teachers (28%), five years; 6 to 10 years for over another quarter (28%), from 11to 15 years for over a third (35%) and 15 years for 9%.

With regard to qualifications, the level of 52% of teachers is at least equivalent to the baccalaureate 16% have a higher level and around a third a level equivalent to the BFEM (secondary school diploma) or a DFEM. A little over two thirds of teachers hold a CAP (teaching certificate[36]) and a quarter hold a CEAP (elementary teaching certificate)[37]. Only 2% have a qualification other than CEAP or CAP and 6% hold no professional qualification.

Table 35: Breakdown of teachers by certain career characteristics

	CI		CP		Overall	
	N	%	N	%	N	%
Number of teachers	37	-	42	-	79	-
Years of experience						
< 5 years	11	28.2%	11	27.5%	22	27.8%
6-10 years	10	25.6%	12	30.0%	22	27.8%
11 - 15 years	14	35.9%	14	35.0%	28	35.4%
> 15 years	4	10.3%	3	7.5%	7	8.9%
Average	8.6		8.4		8.5	
Minimum	1		1		1	
Maximum	20		21		21	
Number of teachers	37	-	42	-	79	-
Status						
Official	21	56.8%	29	69.0%	50	63.3%
Contractual	16	43.2%	13	31.0%	29	36.7%
Academic qualification						
BFEM/DFEM	12	30.8%	13	32.5%	25	31.6%
Baccalaureate	19	48.7%	22	55.0%	41	51.9%
Undergraduate degree	5	12.8%	4	10.0%	9	11.4%

[36]. The CAP is a qualification reserved for teachers. To qualify, an applicant must (i) be a decision-making teacher, hold a baccalaureate, and have at least one year of experience, (ii) be an assistant teacher or (iii) an education volunteer, holder of a baccalaureate and have at least one year of experience. Obtaining this qualification allows a person to move up from being an assistant teacher to a fully-qualified teacher.

[37]. The CEAP is a qualification associated with the grade of assistant teacher. To qualify, an applicant must hold a BFEM/DFEM and have taught for at least a year as an assistant teacher, intern or volunteer.

Masters	3	7.7%	1	2.5%	4	5.1%
	CI		CP		Overall	
	N	%	N	%	N	%
Number of teachers	37	-	42	-	79	-
Professional diploma						
None	1	2.6%	4	10.0%	5	6.3%
CEAP	7	17.9%	12	30.0%	19	24.1%
CAP	30	76.9%	23	57.5%	53	67.1%
Other	1	2.6%	1	2.5%	2	2.5%
Average number of days of continuous training per year (since 2010)						
0	1	2.6%	3	7.5%	4	5.1%
1 to 5	12	30.8%	13	32.5%	25	31.6%
6 to 10	14	35.9%	15	37.5%	29	36.7%
11 to 15	8	20.5%	4	10.0%	12	15.2%
> 15	4	10.3%	5	12.5%	9	11.4%
Average	9.2		7.9		8.7	
Minimum	0		0.00		0	
Maximum	33		32		33	

Teachers were asked about the number of days of continuous training they had undergone per year between 2010 and 2017. Based on their answers, the annual number of days of continuous training they participated in over these 8 years is 9 days per year on average (since 2010). However, this duration is less than 6 days in 37% of cases (including 5% who had not undergone any continuous training). Conversely, in 27% of cases the duration of the continuous training was over 10 days (6% of them had benefitted from around a month of training per year since 2010).

In summary, teachers were mainly civil servants (57% in CI and 69% in CP). On average, they have around 8 or 9 years of experience (with significant variations of 1 to 20-21 years). Half of them had a level of qualification equivalent to the baccalaureate, 32% had a level lower than this and 16% a higher level. Almost all had a professional qualification. Finally, between 2010 and 2018, on average they underwent 9 days of continuous training per year (over 10 days for 27% of them). Only 5% had not received any continuous training.

Degree of comfort in French:

Alongside this, teachers were also asked how comfortable they felt in reading, writing, speaking, understanding and teaching French. Their answers are detailed in Table 35.

Table 36: Breakdown of teachers by their perception of their degree of comfort in French

CI	Reading		Writing		Speaking		Understanding		Teaching	
	N	%	N	%	N	%	N	%	N	%
Not very comfortable	1	2.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Average level of comfort	1	2.6%	2	5.1%	4	10.3%	1	2.6%	1	2.6%
Quite comfortable	8	20.5%	11	28.2%	16	41.0%	13	33.3%	14	35.9%

Very comfortable	29	74.4%	26	66.7%	19	48.7%	25	64.1%	24	61.5%
Total	39	100.0%	39	100.0%	39	100.0%	39	100.0%	39	100.0%

CP	Reading		Writing		Speaking		Understandin		Teaching	
	N	%	N	%	N	%	N	%	N	%
Not very comfortable	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Average level of comfort	3	7.5%	4	10.0%	7	17.5%	3	7.5%	6	15.0%
Quite comfortable	10	25.0%	12	30.0%	15	37.5%	12	30.0%	12	30.0%
Very comfortable	27	67.5%	24	60.0%	15	37.5%	25	62.5%	22	55.0%
Total	40	100.0%	40	100.0%	40	100.0%	40	100.0%	40	100.0%

Almost all the teachers said they were quite comfortable or very comfortable in reading, writing, speaking, understanding and teaching French. Only a minority indicated that they did not feel very comfortable (a single teacher for reading in French), or averagely comfortable. Among those who said they were very comfortable, there are differences in competencies: regardless of grade, teachers were less comfortable in speaking French (49% in CI and 37% in CP) than in reading (74% and 67% respectively), writing (67% and 60%), understanding (64% and 62%) or teaching (61% and 55%) this language. There are also differences between the two grades, with teacher in CI being more numerous than those in CP in considering themselves very comfortable in reading in French (74% in CI and 67% in CP). The other areas of competencies received intermediate figures (respectively for the two grades, 61% and 55% for teaching in French, 67% and 60% for writing in French, and 64% and 62% for understanding French).

To identify teachers' degree of comfort in French, a score which combined their response in the five areas was calculated. The breakdown of this score (Table 36) varies from 0 for teachers least comfortable to 10 for the most comfortable teachers. While 22% of teachers consider themselves to be averagely comfortable in reading, writing, speaking, understanding and/or teaching in French (score lower than or equal to 5), while 20% consider themselves to be rather comfortable in the five areas (score between 6 and 7) and 20% consider themselves to be very comfortable (score between 8 and 9). Only 38% of them perceive themselves as being completely comfortable in all five areas (score of 10). These trends can be found across both grades, with however more CI teachers considering themselves as being perfectly comfortable in all areas (44% compared to 32% in CP) and fewer of them considering themselves as averagely comfortable (18% compared to 25%).

Table 37: Breakdown of teachers by their degree of comfort in French

	CI		CP		Overall	
	N	%	N	%	N	%
0-3	1	2.6%	4	10.0%	5	6.4%
4-5	6	15.4%	6	15.0%	12	15.2%
6-7	8	20.5%	8	20.0%	16	20.2%
8-9	7	17.9%	9	22.5%	16	20.3%
10	17	43.6%	13	32.5%	30	38.0%
Total	39	100.0%	40	100.0%	79	100.0%

In summary, the majority of teachers feels mostly very comfortable in reading, writing, understanding and teaching in French, their proportion being however lower in CP and in CI. On the other hand, less than half (49% in CI and 37% in CP) feel very comfortable in speaking French. Overall, few teachers believe their level of French is very low: 18% (in CI) and 25% (in CP).

Linguistic situation in classes

The following questions relate to the linguistic context within the class and more specifically to the fact of knowing if the teachers used one or several languages other than French with their students, and in the first instance, in the teaching-learning context (Table 37). Almost all teachers said they used another language other than French in class (only three teachers said they didn't do this)[38]. Among these, a little over three quarters said they used only one other language, Wolof in most classes, while 22% said they used several national languages.

Table 38: Use of another language other than French in class by teachers

Speak another language in class	CI		CP		Overall	
	N	%	N	%	N	%
Yes	38	97.4%	39	97.5%	77	97.5%
One language only	29	76.3%	31	79.5%	60	77.9%
Seereer	3	7.9%	1	2.6%	4	5.2%
Wolof	26	68.4%	30	76.9%	56	72.7%
More than one language	9	23.7%	8	20.5%	17	22.1%
No	2	5.3%	1	2.6%	3	3.9%
Total	3	7.9%	1	2.6%	4	5.2%

Teachers were also asked about their use of languages other than French with their students outside of class (to announce recess, correct student behavior, etc.). Their responses are shown in Table 38.

Table 39: Use of a language other than French by teachers outside of class

	CI		CP		Overall	
	N	%	N	%	N	%
Yes	37	100.0%	37	88.1%	74	93.7%
One language only	28	75.7%	31	83.8%	59	79.7%
Seereer	4	10.8%	1	2.7%	5	6.8%
Wolof	24	64.9%	30	81.1%	54	73.0%
More than one language	9	24.3%	6	16.2%	15	20.3%
No	2	5.4%	3	7.1%	5	6.3%
Total	37	100.0%	42	100.0%	79	100.0%

We find the same trends as those presented above with regard to languages used in class. Here again, almost all teachers (except five) say they use one other language other than French outside

[38]. Among CI classes, 30 were involved with the Lecture Pour Tous program in 2017-2018. In these classes, the teacher had to introduce Pulaar, Serer, or Wolof into their teaching of reading. All said they had used the language chosen for the school in class.

of the teaching-learning context. Among them, around 80% said they used only one language (Wolof in the great majority of cases); only 20% said they used at least two national languages.

To have a more precise idea of the language or languages used in and outside of class, teachers were asked to estimate the frequency of their interactions in French the frequency of their interactions in national languages. Based on this, we have cross-referenced their responses to create a rough set of three groups (as shown in the colored sections of the following Table 39).

. The first group (in green) for which interactions were most frequently in French: 12 classes in CI (31% of CI classes) and 17 in CP (43%);
. The second group (in pink) for which interactions were most frequently in national languages: 16 classes in CI (41%) and 17 in CP (43%);
. The third group (in yellow) for which interactions were equally in both French and national languages: 11 classes in CI (28%) and 6 in CP (15%).

Table 40: Frequency of interactions in French and NL in and outside of class

CI		Frequency of interactions in one or more other languages					
		Very few	Few	Average	Many	A lot	Total
Frequency of interactions in French	Very few				2	3	5
	Few		3	1	2	1	7
	Average		6	6	2	1	15
	Many	1	7	2			10
	A lot	1	1				2
	Total	2	17	9	6	5	39

CP		Frequency of interactions in one or more other languages					
		Very few	Few	Average	Many	A lot	Total
Frequency of interactions in French	Very few	1			1		2
	Few		1		2		3
	Average		8	6	3		17
	Many		12	2		1	15
	A lot		3				3
	Total	1	24	8	6	1	40

In summary, almost all teachers used one language other than French, most often Wolof, for their interactions with students, both in class and outside it (100% in CI and 88% in CP). Around 20% of them used a second NL.

The various teaching-learning activities:

Teachers were asked about the frequency they used various types of activity in their class. Table 40 shows the number of minutes dedicated, in a typical week, to various activities in French for students who were in CI or CP the previous year (those who were evaluated in CP and CE1). Teachers say they spent, both in CI and in CP, on average over three hours teaching spoken language and on reading and writing (coding and comprehension), as well as working on texts and discussion. They say they spent a little more time teaching oral vocabulary in CP (2 hours) than in CI (around 1.45 hours) and, conversely, less time working on code in reading in CP (a little over 1.45) than in CI (a little over 2 hours), which is surprising, just like the fact that, regardless of grade, some said they had not dedicated any time to teaching vocabulary, code, (in reading and writing) or grammar.

Table 41: Number of minutes dedicated to various activities each week

	Average	Standard deviation	Minimum	Maximum
CI				
Teaching spoken language	222	143	60	710
Work on texts and discussion	195	153	30	710
Teaching grammar	87	80	0	300
Oral vocabulary	107	74	0	300
Teaching code for reading	132	84	0	350
Working on reading comprehension	92	48	30	180
Teaching code for writing	98	69	0	350
	Average	Standard deviation	Minimum	Maximum
CI				
Graphic work for writing	106	68	30	300
CP				
Teaching spoken language	221	124	90	710
Work on texts and discussion	209	124	30	710
Teaching grammar	96	91	0	300
Oral vocabulary	120	108	0	600
Teaching code for reading	106	73	0	300
Working on reading comprehension	107	71	7	300
Teaching code for writing	93	78	0	300
Graphic work for writing	82	59	0	240

Table 41 to 45 show the frequency at which the teachers of the students seen in CP and in CE1 implemented in the year preceding the study (in CI and CP) various activities in areas such as vocabulary, teaching code in reading, comprehension and oral expression, etc. Firstly, with regard to vocabulary (grouping words by category: animals, trees, etc.), table 41 below shows that most teachers said they use this type of activity several times per week, almost every day (in CI, respectively 69% and 8%; in CP 57% and 15%). Several (3 or 4) said they never worked on vocabulary.

Table 42: Breakdown of classes by frequency of vocabulary activities

	CI		CP	
	N	%	N	%
Never	3	7.7%	4	10.0%
Once a month	6	15.4%	7	17.5%
Several times per week	27	69.2%	23	57.5%
Every day	3	7.7%	6	15.0%
Total	39	100.0%	40	100.0%

Table 42 shows the frequency of activities dedicated to oral comprehension and expression. Most teachers reported that, several times per week, they told students stories, or asked them to speak about an event, or even to recite a poem from memory (in CI, respectively 59%, 64% and 67%; in CP, 55%, 70% and 60%). As with vocabulary, several teachers said they never used this type of exercise (2 to 3 never read stories to students and never asked them to speak about an event).

Table 43: Breakdown of CI and CP teachers by frequency of activities dedicated to oral expression and comprehension

	Teacher read stories out loud		Asked a student to speak about an event		Asked a student to recite from memory	
	N	%	N	%	N	%
CI						
Never	2	5.1%	3	7.7%	2	5.1%
Once a month	1	2.6%	5	12.8%	8	20.5%
Several times per week	23	59%	25	64.1%	26	66.7%
Every day	13	33.3%	6	15.4%	3	7.7%
Total	39	100.0%	39	100.0%	39	100.0%
CP						
Never	0	0.0%	2	5.1%	1	2.5%
Once a month	3	7.5%	8	20.5%	12	30.0%
Several times per week	22	55.0%	26	66.7%	24	60.0%
Every day	15	37.5%	3	7.7%	3	7.5%
Total	40	100.0%	40	100.0%	40	100.0%

Table 43 shows the frequency of activities dedicated to learning code in reading and writing for CI (seen in CP) and CP (seen in CE1) students. Most CI teachers practice activities on the name, sound, and writing of letters every day (69%, 72%, 54%) as well as phonemes and common grapheme phoneme relationships (54% and 51%). Those concerning the grapheme phoneme relationships dependent on context and morphology are practiced more rarely: several times per week by 59% and 44% of teachers. The percentages in CP are similar, with however fewer teachers carrying out daily activities relating to letters, phonemes and common grapheme phoneme relationships (for the name, sound, and writing of letters: 60%, 55% and 40%; 40% for phonemes and the most common grapheme phoneme relationships). Activities on grapheme phoneme relationships dependent on context are more often practiced than in CI (several times per week for 70% of teachers).

Table 44: Breakdown of teachers by frequency of activities on code in writing

	N	%	N	%
CI				
Number of teachers	39	-	39	-
	Learning names of letters of the alphabet		Learning the sounds of letters of the alphabet	
Several times per week	12	30.8%	11	28.2%
Every day	27	69.2%	28	71.8%
	Learning to write letters of the alphabet		Elementary sounds of oral language (phonemes)	
Never	0	0.0%	1	2.6%

	N	%	N	%
CI				
Number of teachers	39	-	39	-
Several times per week	18	46.2%	17	43.6%
Every day	21	53.8%	21	53.8%

	N	%	N	%
CI				
Number of teachers	39	-	39	-
	Most common grapheme phoneme relationships		Context- or morphology-dependent relationships	
Never	0	0.0%	10	25.6%
Once per month	0	0.0%	3	7.7%
Several times per week	19	48.7%	23	59.0%
Every day	20	51.3%	3	7.7%
CP				
Number of teachers	40	-	40	-
	Learning names letters of the alphabet		Learning the sounds letters of the alphabet	
Never	1	2.5%	1	2.5%
Several times per week	15	37.5%	17	42.5%
Every day	24	60.0%	22	55.0%
	Learning to write letters of the alphabet		Elementary sounds of oral language (phonemes)	
Never	1	2.5%	0	0.0%
Once per month	0	0.0%	2	5.0%
Several times per week	23	57.5%	22	55.0%
Every day	16	40.0%	16	40.0%
	Most common grapheme phoneme relationships		Context- or morphology-dependent relationships	

	N	%	N	%
CI				
Number of teachers	39	-	39	-
Never	0	0.0%	1	2.5%
Once per month	1	2.5%	3	7.5%
Several times per week	23	57.5%	28	70.0%
Every day	16	40.0%	8	20.0%

With regard to grammar (Table 44), in both CP and CI, while around 40% of teachers said they worked on several types of phrases (interrogatives, negatives, etc.) several times a week, more (around 45%) said they never covered this. Exercise drills for sentence order were practiced several times a week by 72% to 75% of teachers in CI and CP respectively.

Table 45: Breakdown of teachers by frequency of grammar activities

	CI		CP	
	N	%	N	%
Number of teachers	39	100.0%	40	100.0%
Work on different types of phrases (interrogatives, negatives, etc.)				
Never	18	46.2%	18	45.0%
Once a month	2	5.1%	2	5.0%
Several times per week	15	38.5%	16	40.0%
Every day	4	10.3%	4	10.0%
Ask students to put words in order and add any missing words				
Never	3	7.7%	0	0.0%
Once a month	0	0.0%	2	5.0%
Several times per week	28	71.8%	30	75.0%
Every day	8	20.5%	8	20.0%

Table 45 shows the frequency of activities dedicated to conjugation. As in CP, in CI almost 70% of teachers gave conjugation exercises at least several times a week on this (including irregular verbs) and ways to show the past and future. Activities around the past tense or future tense of irregular verbs were less common. It is not very surprising for the future tense which, in French, can be expressed through non-verbal expressions ("*Je viens demain*" - "I'll come tomorrow"). On the other hand, it is regrettable for the past tense, which can only be expressed through the verb and based on simple marking, covered by most teachers: the present of the two most common irregular verbs (*être* and *avoir*; i.e. *j'ai vendu ma voiture* (I sold my car) or *il est parti* (He left)). And finally, many teachers said they never covered the issue of verbal tenses with students (between 12% and 61%).

Table 46: Breakdown of teachers by frequency of conjugation activities

CI	N	%	N	%
Number of teachers	39	-	39	-
	Conjugation of verbs in the present tense		Most common irregular verbs in the present tense	
Never	8	20.5%	12	30.8%
Once per month	3	7.7%	0	0.0%
Several times per week	10	25.6%	14	35.9%
Every day	18	46.2%	13	33.3%
	Ways to show the past tense		Ways to show the future tense	
Never	6	15.4%	6	15.4%
Once per month	6	15.4%	7	17.9%
Several times per week	21	53.8%	21	53.8%
Every day	6	15.4%	5	12.8%
	Most common irregular verbs in the past tense		Most common irregular verbs in the future tense	
Never	24	61.5%	20	61.5%
Once per month	1	2.5%	2	2.6%
Several times per week	8	20.5%	12	20.5%
Every day	6	12.5%	5	15.4%

CP	N	%	N	%
Number of teachers	40	-	40	-
	Conjugation of verbs in the present tense		Most common irregular verbs in the present tense	
Never	9	22.5%	9	22.5%
Once per month	0	0.0%	0	0.0%
Several times per week	18	45.0%	18	45.0%
Every day	13	32.5%	13	32.5%
	Ways to show the past tense		Ways to show the future tense	
Never	5	12.5%	5	12.5%
Once per month	4	10.0%	4	10.0%
Several times per week	26	65.0%	26	65.0%
Every day	5	12.5%	5	12.5%

CP	N	%	N	%
Number of teachers	40	-	40	-
	Most common irregular verbs in the past tense		Most common irregular verbs in the future tense	
Never	19	47.5%	19	47.5%
Once per month	3	7.5%	3	7.5%
Several times per week	13	32.5%	13	32.5%
Every day	5	12.5%	5	12.5%

In summary, with regard to teaching activities linked to the competencies evaluated in this project, teachers say they spent a little more time teaching oral vocabulary in CP than in CI and, conversely, a little less time working on code in reading in CP than in CI, which is surprising, just like the fact that, regardless of grade, some said they had not dedicated any time to teaching these two activities, just as with those relating to oral comprehension and expression. Uniquely, certain activities linked to learning code were practiced every day by over 50% of teachers: in CI, those relating to the name, sound and writing of letters (69%, 72% and 54% respectively) as well as to phonemes and common grapheme phoneme relationships (54% and 51%); in CP those relating to the name and sound of letters (60% and 55%). None of the other activities were worked on daily by over half of teachers. Those relating to vocabulary were several times per week by over 50%

of teachers and more often in CI (69%) than in CP (57%), as were those relating to contextual grapheme phoneme relationships, but more often in CP (70%) than in CI (59%).

Based on the responses provided by teachers, we created, for each school grade, standardized indicators (with an average of 0 and a standard deviation of 1) based on the frequency with which the teachers used activities in the following areas:

. "Teaching spoken language" based on the question relating to the number of minutes dedicated to the teaching of spoken language in a typical week.
. "Vocabulary" based on the questions relating to (i) the number of minutes dedicated to the teaching of oral French vocabulary in a typical week, and (ii) the frequency with which they worked with children on the grouping of words by category (animals, etc.).
. "Oral comprehension" based on the questions relating to (i) the number of minutes dedicated to working on a text and discussion in French (reading and discussions around a story, etc.) in a typical week, (ii) the number of minutes dedicated to working on comprehension in a typical week, (iii) the frequency with which they read stories aloud to children, (iv) the frequency with which they ask children what they understood of a story that was read to them (who were the characters, what did they do, when, why, etc.), (v) the frequency with which they asked children to speak about an event which has happened to them, (vi) the frequency with which they asked children to ask questions an this event and (vii) the frequency with which they asked children to give their opinion on a given subject (food, town and country, etc.).
. "Learning the code for reading" based on the questions relating to (i) the number of minutes dedicated to teaching the code in a typical week, (ii) the frequency with which they worked on learning the sounds of letters of the alphabet, (iii) the frequency with which they worked on the elementary sounds of spoken language (phonemes), (iv) the frequency with which they worked on the most common and consistent grapheme phoneme relationships, (v) the frequency with which they worked on context-dependent grapheme phoneme relationships (such as the two "s" in the French word "*sosie*", which are pronounced differently depending on context) and (v) the frequency with which they worked on grapheme phoneme relationships for morphological marks (differences between writing and speaking; words which are pronounced the same but written differently).
. "Reciting from memory" based on the question relating to the frequency with which they asked children to recite texts from memory.
. "Grammar" based on the questions relating to (i) the number of minutes dedicated to teaching French phrases and grammar in a typical week, (ii) the frequency with which they asked children to put words in the correct order (such as "Pape Pomme Mange" = > "*Pape mange une pomme*") and add the missing word, and (iii) the frequency with which they worked on certain types of sentence (declarative, interrogative, negative, imperative).
. "Conjugation" based on the questions relating to the frequency with which the teachers worked on (i) the conjugation of verbs in the present tense, (ii) ways to express the past, (iii) or the future, (iv) the most common irregular French verbs (*être, avoir, faire, dire, aller*) in the present tense, (v) the most common irregular French verbs in the future tense and (vi) the most common irregular French verbs in the past tense.

It should be noted that these indicators were constructed in such a way that a higher score corresponds to more frequent use of activities in class.

Results of the regression analysis:

After identifying the differences in the way classes were organized and in the activities used by teachers in the year preceding the study, it is important to examine the relationships between the variability of the conditions and teaching-learning activities and that of the levels of oral French vocabulary of students in CP and CE1 (who were in CI and CP in the year preceding the study). We created regression models in which the variable to be explored is the score in oral French vocabulary (based on a standardized factor analysis with an average of 100 and a standard deviation of 15). The explanatory variables are the ways in which classes are organized and the activities used by teachers in the year preceding the study, in addition to the characteristics of the students and family environments already examined (Table 46).

An initial remark concerns the explanatory power of the two models (R^2). We can see that on the one hand, the consideration of students' characteristics and those of their family environment, and on the other, of the educational context and teaching-learning activities they have experienced in the year preceding the study, explains only 31% of the variance in students' scores in CP and 23% of the variance in the scores of students in CE1. These figures suggest that factors other than those introduced into the models may explain the variability of the levels of students' oral French vocabulary.

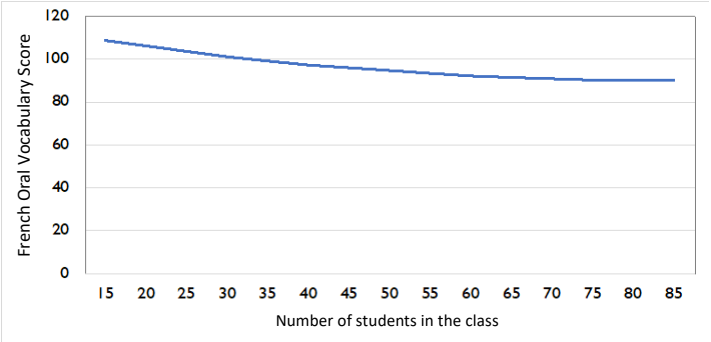
Table 47: Regression analyses of students' vocabulary score using certain social variables and conditions and teaching activities in 2017-2018 (including the characteristics of students and their family environment)

Variable		Modalities	CP	CE1
Constant			-322.40 ***	248.20 ***
Class characteristics	Class size		-0.66 ***	-0.14 **
	Class size²		0.004 ***	-
	LPT program (only for students currently in CP)	No	ref.	NC
		Yes	7.31 ***	
	French exercise books	No	-	ref.
		Yes		5.88 ***
	Length of school year (in weeks)		24.48 ***	-8.93 ***
	Length of school year² (in weeks)		-0.36 ***	0.12 **
	Interruptions during the school year	< 30 days	ref.	-
		> 30 days	-7,72 ***	
Teacher characteristics	Teachers' level of academic qualification	BFEM	ref.	-
		Bac	-8.05 ***	
		Degree and above		
	Teachers' level of professional qualification	None	-	ref.
		CEAP		
		CAP		5.33 ***
Teaching-learning activities	Conjugation		-2.85 ***	-3.03 ***
	Number of minutes spent teaching phrases and grammar		-	0.03 ***
	Number of minutes spent working on reading comprehension			-0.11 ***
R^2			31.2%	23.1%

** = significant at a threshold of 0.01 and *** = significant at a threshold of 0.001

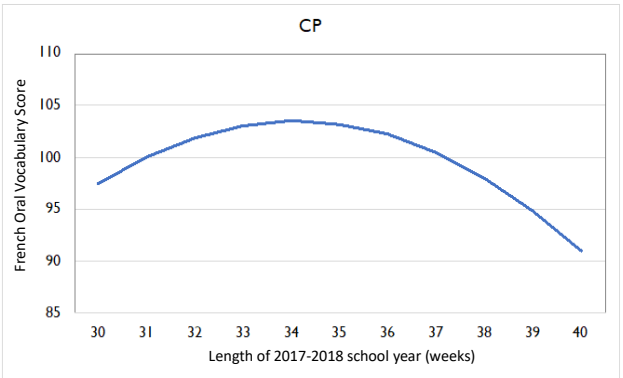
Among the class characteristics which help explain the variability of students' performance on the vocabulary test, firstly we can see a significant negative relationship between the level of students' oral French vocabulary and class size. We must remember that there is quite a large amount of variability in this area, with the number of students per class varying from a little under 10 to over 100 in both grades. The effect of class size is certainly negative in both grades, but has different impacts: it is linear in CE1, where one additional student in the class corresponds to a drop in students' oral French vocabulary score of 0.14 points, which is not the case in CP. For further clarity, in Figure 13 we have represented the relationship between the two variables for CP students. We can thus see that students' level of oral French vocabulary decreases when the class size increases, with however a threshold of around 50 or 55 students, after which the negative effect reduces. We should however remember that this effect is quite moderate across both grades.

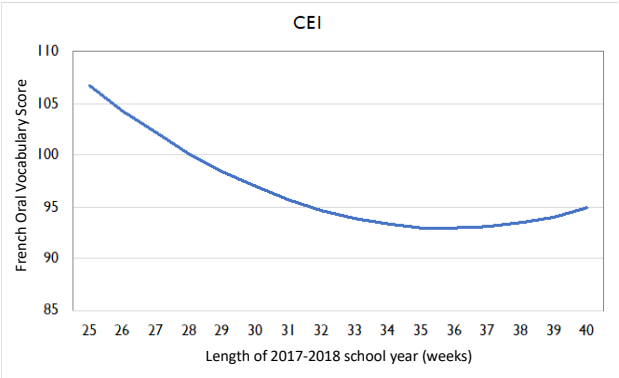
Figure 13:Relationship between oral vocabulary score and CI class size



The length of the school year also introduces differences in the level of students' oral French vocabulary in CP and CE1. Here there is great variability between classes in the length of the school year: while the 2017-2018 school year lasted on average for 36 weeks for CP students and 35 weeks for those in CE1, in reality it varied from 29 to 41 weeks for CP students and from 25 to 42 weeks for those in CE1. For easier comprehension, in Figure 13 we have represented the relationship between the students' oral French vocabulary score and the length (in weeks) of the preceding school year (CI for CP students and CP for CE1 students).

Figure 14:Relationship between oral vocabulary score and length of the school year





The relationship between the students' oral French vocabulary score and the length (in weeks) of the school year preceding the assessment follows different trends between the grades. For

CP students, the figure shows that a CI year lasting from 32 to 36 weeks would be optimal for a better level of oral French vocabulary, while for CE1 students, the optimal figure would be a duration of around 25 weeks for CP students. These figures are quite surprising: we would have expected that the effect of the length of the school year would be similar across both grades. In any case, the length of time students need to improve their level of oral French vocabulary seems to be longer in the case of CI than in the case of CP. Still looking at time in school, the analyses show that for CP students, the fact that school activities were interrupted for over a month during the CI year had a negative effect on their level of oral French vocabulary (of about 8 points). This negative effect, which does not exist for CE1 students, and the result relating to the effect of the length of the school year, indicate that students need a longer and more continuous time in CI than in order to improve their level in oral French vocabulary.

We should however remember that these results give only a very general indication of time in school, as they concern only the length of time over which the school year takes place. It would be interesting to ultimately analyze the effective teaching time from which the students benefit, by taking into consideration, for example, the operating time of each school, the frequency and duration of absenteeism of the teachers and students, or even the instruction time devoted to each activity[39].

Two other class characteristics influence students' level of oral French vocabulary. One the one hand, CP students who were in a CI class participating in the Lecture Pour Tous program the year preceding the survey, and who therefore benefitted from hours of teaching reading in a national language, have a level of oral French vocabulary greater (by 7 points) than that of students who did not benefit from this system. On the other hand, CE1 students using a French exercise book (shared or not) during their year in CP had a positive effect on their level of oral French vocabulary.

Regarding the characteristics of teachers, numerous variables such as their gender, status, years of experience and even the number of days of continuous training which they had undergone, were introduced into the models, but did not have any significant impact on students' level of oral French vocabulary. Conversely, on the one hand, CP students who had a teacher with degree or a master's degree have an oral French vocabulary level lower than that of students who had a less qualified teacher. This kind of result, surprising in comparison to the results in developed countries, is quite common in literature on assessing the skills of students in Africa[40]. On the other hand, CE1 students who had a CP teacher with the CAP had a higher level of oral French vocabulary (in the order of 5 points) than the others (without teaching training or holders of a CEAP qualification).

With regard to the teaching-learning activities the students experienced in the year preceding the study, the results are rather disappointing. Indeed, the students' level of vocabulary was not influenced by activities in this area. Analyses highlight a negative relationship, for students in both CP and CE1, between their level of oral French vocabulary and the frequency of activities dedicated to conjugation in class. We will return to this issue later in the discussion.

It also emerges from analyses that CE1 students have a better level of oral French vocabulary when, in CP, they spent more time working on learning sentences and grammar, and less time

[39]. See Abdazi (2007).
[40]. Mingat & Suchaut (2000); Bernard, Tyab & Vianou (2004); Michaelowa & Wechtler (2006).

working on reading comprehension. It is also quite surprising that, while time dedicated to these two areas has a significant effect on the vocabulary level of the students, the content of the activities in these two areas does not. We will also return to this issue later in the discussion.

In summary, the level of oral French vocabulary reduces when the number of students in the class increases, with a threshold of around 50-55 after which the negative effect (very moderate in the two classes examined, CI for students seen in CP and CP for those seen in CE1) reduces. The amount of time students need to improve their level of oral French vocabulary is greater in CI than in CP. Furthermore, the level of oral French vocabulary is higher (around half a standard deviation) than CP students who were in CI in a class participating in the Lecture Pour Tous program than those who did not benefit from this system. With regard to the characteristics of teachers, the level of oral French vocabulary in CP students (and only them) who in CI had a teacher with a degree or master's degree is lower than that of students who had a less qualified teacher. Conversely, this level is higher among students in CE1 (and only them) who in CP had a teacher with the CAP qualification compared to those who did not have this qualification. And finally, time spent in CP on exercises related to grammar had a positive effect on the level of oral French vocabulary while the effect of those dedicated to written comprehension is negative. These results are all the more surprising given that the content of the activities in these two areas had no effect.

3.3.4. Results of the pre-reading and reading tests

To define the time and methods for introducing French, and knowing that the acquisition of vocabulary is key for developing language skills and, ultimately, in learning to read, in addition to examining the variability in the level of students' oral French vocabulary, we must examine the factors that explain the variability in the level of CI and CP students' level of pre-reading and the level of reading of students in CE1.

The first step is to target the characteristics of students and their family milieu, to examine if there are disparities in the level of pre-reading or reading in students according to their characteristics and measure to what degree. The second step will examine if, and to what extent, students' level of oral French vocabulary has an effect on their level of pre-reading or reading to identify if there is a minimum level of vocabulary needed for optimal preparation in learning to read. The third and final step examines the structure of the classes in which the CP and CE1 students were educated in the year preceding the study (2017-2018), and the time and content of the activities dedicated to learning to read that they experienced. This will examine the relationships between the variability in teaching conditions and activities, and those of students' levels of pre-reading or reading.

3.3.4.1. By student characteristics and their family environment

Seeking to explain the variability in students' level of pre-reading in CI and CP, we built a regression model for each grade, in which the variable to be explored is the score obtained in pre-reading (created based on a standardized factor analysis with an average of 100 and a standard deviation of 15), and the explanatory variables are the characteristics of students, as well as those of their family environment. The estimates from these models are provided in Table 47.

The characteristics of students and their family environment have very little impact on students' level of pre-reading. The share of variance (R^2) explained by these variables amounts to only 6% in CI and 13% in CP. Among those which introduce differences, some are common to both grades. This is for example the case with the family sociocultural situation, students coming from average or advantaged families in this regard had a better level of reading than the others (around 6 points in CI and 3 points in CP). The same applies for reading practice by students at home, which had a positive effect on students' pre-reading (4 to 6 points according to grade and according to if the students read alone and/or with an adult). This result is interesting as it shows that by creating conditions that enable children to look at or read books alone and/or with an adult, it is possible to help them improve their level of pre-reading.

Table 48: Regression analyses of the pre-reading score of students in CI and CP by certain social variables and by level of oral French vocabulary

Variable	Modalities	CI	CP
Constant		88.90 ***	82.17 ***
Location	Rural	ref.	ref.
	Urban	-5.34 **	0.54 (ns)
Gender	Girl	ref.	ref.
	Boy	-0.10 (ns)	2.77 (ns)
Age (in years)		0.86 (ns)	1.26 (ns)
Attendance at pre-school	0 to 2 years	-	ref.
	3 years		5.72 *
Sociocultural family situation	40% the most disadvantaged	ref.	ref.
	20% average family situation 40% the most advantaged	6.18 ***	3.44 *
Reading, speaking, learning French words at home	0 to 2 activities	-	ref.
	3 activities		5.19 *
Reading practice at home	None	ref.	ref.
	Reading alone or with an adult		4.61 *
	Reading alone and with an adult	6.10 *	6.42 ***
R^2		6.0%	12.7%

Other characteristics had an effect on the level of students' pre-reading by only in one grade. In CI, the level of pre-reading seems to be a little better among students living in a rural milieu (around 5 points compared to their peers living in an urban milieu, the difference reaching 9 points when allowing for students with an equivalent level of oral French vocabulary). This is surprising, even more so as this effect is not significant in CP. Among students in this grade, it appears that those who had attended pre-school for three years had a level of pre-reading a little higher (almost 6 points) than the others, this effect however fades when the level of oral French vocabulary in taken into consideration. The fact that students speak, learn words and read with someone from their immediate environment also has a beneficial effect on their level of pre-reading (around 5 points).

The same type of analyses were carried out for CE1 students based on their reading score. Estimates are provided in Table 48. The results for CE1 students are quite similar to those for CP students. Indeed, the characteristics of students and their family environment only explain a small part (6%) of the variability in students' level of reading. Only attendance at a pre-school and reading at home improved students' reading level.

Table 49: Regression analyses of reading score in CE1 by social variables

Variable	Modalities	
Constant		96.46 ***
Location	Rural	ref.
	Urban	2.67 (ns)
Gender	Girl	ref.
	Boy	-2.52 (ns)
Age (in years)		0.10 (ns)
Pre-schooling	No	ref.
	Yes	4.82 *
Reading practice at home	None	ref.
	Reading alone or with an adult	
	Reading alone and with an adult	5.38 ***
R^2		6.4%

3.3.4.2. By students' level of oral French vocabulary

After seeing that students' levels of pre-reading and reading were not very dependent on their characteristics or those of their family, a second avenue of analysis aiming to explain the variability of the scores they obtained focuses on students' level of oral French vocabulary. This will analyze if, and to what extent, this level has an effect on their level of pre-reading or reading and identify if there is a minimum level of vocabulary needed for students to be optimally prepared for learning to read.

To do this, for each grade level we created regression models in which the variable to be explored is the pre-reading or reading score obtained by students (based on a standardized factor analysis with an average of 100 and a standard deviation of 15), and introduced the following explanatory variables: (i) the characteristics of students and their family environment; (ii) the score obtained by students in the oral French vocabulary test, as well as this same score squared, with this last one aiming to account for the fact that the relationship between the level of pre-reading and level of oral French vocabulary cannot be linear[41]. The estimates from these models for students in CI and CP are provided in Table 49.

[41]. It is possible that the relationship between the variable to be explained (here, the pre-reading score) and the explanatory variable (here, the vocabulary score) is not linear. An indication is that the graphic representation of the relationship between the two variables is not straight but is a curve. To the degree that the ordinary least square method (used here) is a linear regression method, which assumes that the modeled relationships are linear, it is then necessary to transform the explanatory variable. Several non-linear transformations are possible (logarithmic, exponential, etc.), the most common (and the one used here) being the logarithmic transformation, the introduction of a higher squared term.

Table 50: Regression analyses of students' pre-reading score (CI and CP) by oral French vocabulary level (accounting for the characteristics of students and their family environment)

Variable	CI	CP
Constant	177.26 ***	105.27 ***
Vocabulary score factor	-2.27 ***	-0.80 ***
Vocabulary score factor²	0.01 ***	0.01 ***
R^2	16.1%	20.3%

Firstly, here we can see that taking the level of oral French vocabulary into account improves the explanatory power of the models (R^2 is 6% in CI and 8% in CE1 when only the characteristics of students and their family were taken into account). Secondly, there is a positive and significant relationship between the level of students' oral French vocabulary and their level of pre-reading. For greater clarity, we have simulated the pre-reading score obtained by students according to their oral French vocabulary score in Figure 15 (for CI students) and Figure 16 (for CP students) based on the effective scores obtained in the oral French vocabulary test by students in the sample.

Figure 15:Relationship between oral vocabulary and pre-reading in CI.

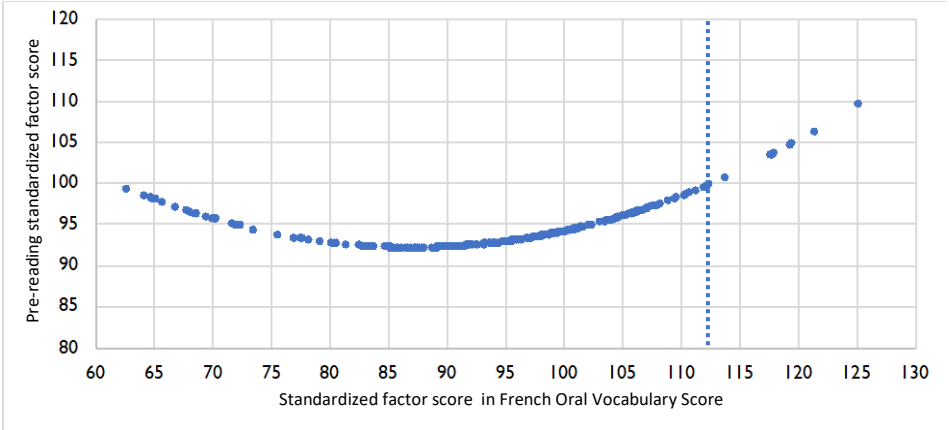
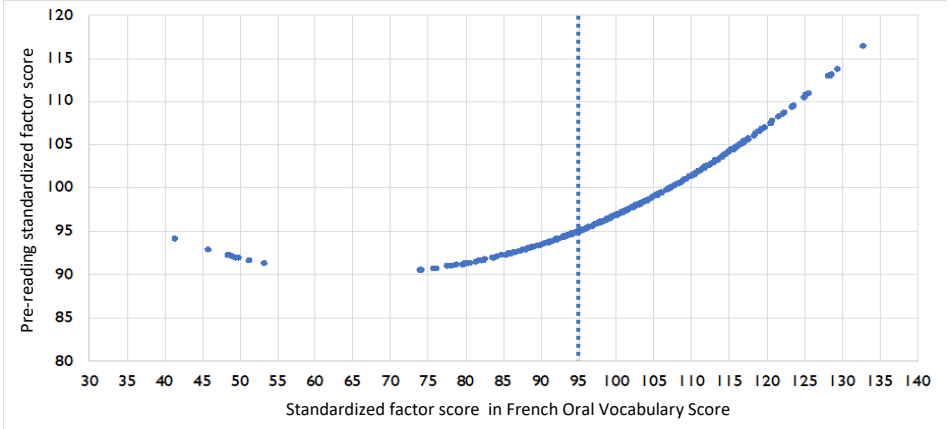


Figure 16:Relationship between oral vocabulary and pre-reading in CP.



The shape of the curves that represent the pre-reading level of students is similar at both levels: it stalls lowest under a certain oral vocabulary score in French but exhibits clear growth when students exceed this threshold. Therefore, there is a minimum, oral French vocabulary to acquire for this to have a positive effect on the pre-reading level. This threshold varies depending on levels: it is around 110 (at about one standard deviation) at entry into CI and at about 95 at entry into CP (below these scores, the level of French oral vocabulary does not correspond to an improvement in the pre-reading level of students). Comparing these thresholds with the scores obtained by the students of the sample, as represented by the points in the graphs, we find (i) that, at entry into CI, only 4% of students have an oral French vocabulary level greater than 110 and (ii) that, at entry into CP, 59% of students attain a score equivalent to 95.

We learn two things from these results. First, it is necessary to seek to improve the level of oral French vocabulary of students in CI, before they begin to learn reading, to the degree that oral French vocabulary has a positive and significant effect on the pre-reading level. Then, the level of oral French vocabulary of upon entry into CI is located below the threshold where it has an effect on pre-reading; the level of oral French vocabulary is even below the threshold beyond which there is a positive effect on the level of pre-reading for 41% of students at entry into CP. Predictably, 59% of CP students have an oral French vocabulary level that makes it possible for them to "maximize" their pre-reading level

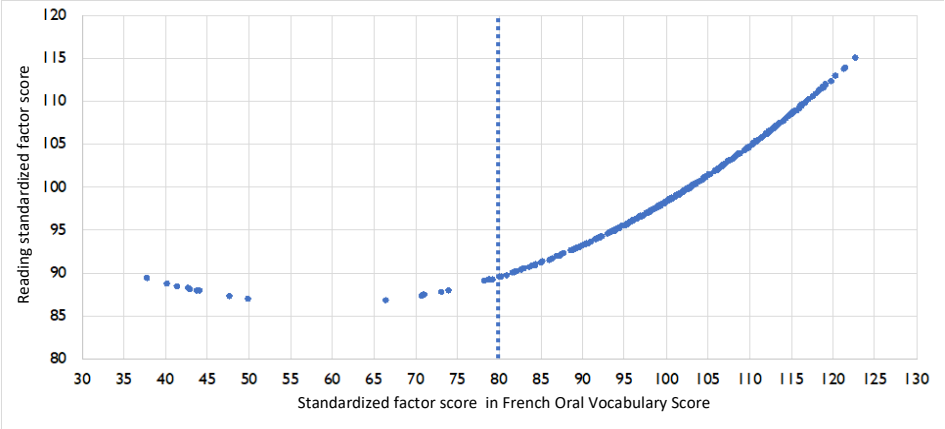
The same type of analyses were conducted for CE1 students, on the basis of the score they obtained on the reading test, which is very rigorous. The estimates are provided in table 50 below.

Table 51: Regression analyses of the reading score of CE1 students according to the oral French vocabulary score (taking student characteristics and their family environments into consideration).

Variable	Overall reading score
Constant	109.96 ***
Vocabulary score factor	-0.83 ***
Vocabulary score factor^2	0.01 ***
R^2	21.7%

Once again, taking the oral French vocabulary level into consideration improves the explanatory power of the models (from 6% when only the characteristics of the students and of their family environments are considered, to 22% when the level of oral French vocabulary of the students is integrated into the model). In addition, there is a positive and significant relationship between the level of oral French vocabulary of students and their pre-reading level. Graph 17 below represents the relationship between reading levels and those of oral French vocabulary of CE1 students. The reading level of students increases significantly once they have attained a certain level of oral French vocabulary, which is around 80. Comparing this threshold with the scores obtained by the students of the sample, as represented by the points in the graphs, we find that only 7% of students have an oral French vocabulary level less than this threshold. The great majority of them (93%) therefore have an oral French vocabulary which is sufficient to translated positively into their reading level.

Figure 17:Relationship between oral vocabulary levels and reading in CE1.

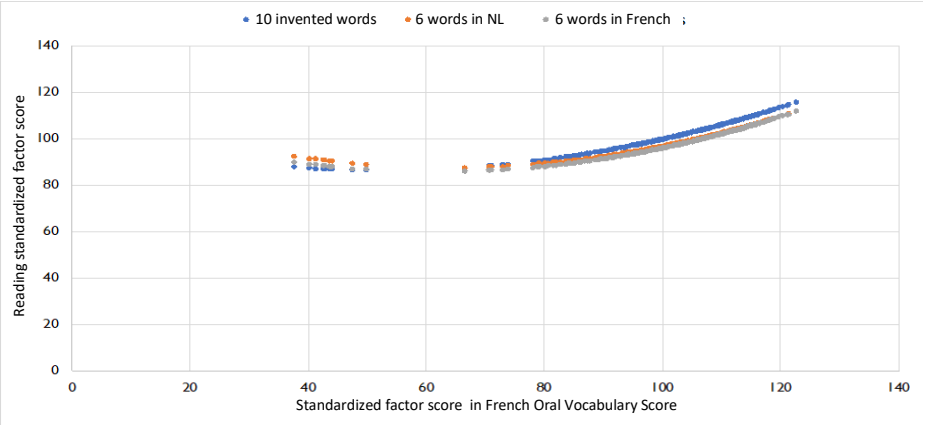


It is possible that the level of oral French vocabulary has a different effect on their reading level depending on the nature and language of the words that they must read. In order to examine this question, we build regression models, using as variables to explain the reading scores of students (i) on 10 invented words, (ii) on 6 words from the NL and (iii) on 6 French words. The results of the models are provided in table 51 below, and are supplemented by graph 18 below, which represents the relationship between the oral vocabulary score and the three reading scores. The analyses indicate principally, and as was expected, that the level of oral French vocabulary more forcefully explains the variability of reading scores of French words than of invented words or those from NLs.

Table 52: Regression analyses of the reading score in CE1 according to the oral French vocabulary score (taking into consideration the characteristics of students and their family environments)

Variable	Score on the 10 invented words	Score on the 6 NL words	Score on the 6 words in French
Constant	106.90 ***	116.82 ***	112.06 ***
Vocabulary score factor	-0.64 ***	-0.90 ***	-0.87 ***
Vocabulary score factor^2	0.01 ***	0.01 ***	0.01 ***
R^2	17.9%	16.8%	20.7%

Figure 18:Relationship between the oral French vocabulary score and the scores from different parts of the reading test.



In summary, regardless of the class, the relationship between the oral French vocabulary level of the students and their pre-reading level is positive and significant. In addition, always regardless of the class, a certain level of oral French vocabulary must be attained for it to have a positive impact on pre-reading or reading levels. While the oral |French vocabulary level for almost all students upon entry into C1 is situated below this threshold, this is still the case for 41% of CP students, but for only 7% of CE1 students. CE1 therefore seems to be the most propitious period for introducing L2 French reading learning, at least at the level of the word. This conclusion is reinforced by the fact that the assessments made at this time also made it possible to report that the level of oral French vocabulary fore forcefully explains the variability of reading scores of French words, compared to invented words or those from the NLs.

Up until now, we considered the effect of oral French vocabulary of students on their pre-reading or reading level separately for each level. Since we have the scores obtained on four items common to the three levels *(sa, la, dé, ti)*, it is possible to estimate if the effect of the level of oral French vocabulary on the level of decoding is different depending on the classes, and to what degree. As above, we pose the hypothesis (i) that the students must have attained a certain threshold of oral French vocabulary before beginning to learn reading and (ii) that this threshold is located before the effect of the level of oral French vocabulary on the pre-reading level is the strongest.

Concretely, we therefore seek to explain the pre-reading score of the four common items (SCLECT) of the students with:

SCLECT = f (CIFAM, CP, CE1, ln (SCVOCA), CPlnSCVOCA, CE1lnSCVOCA)

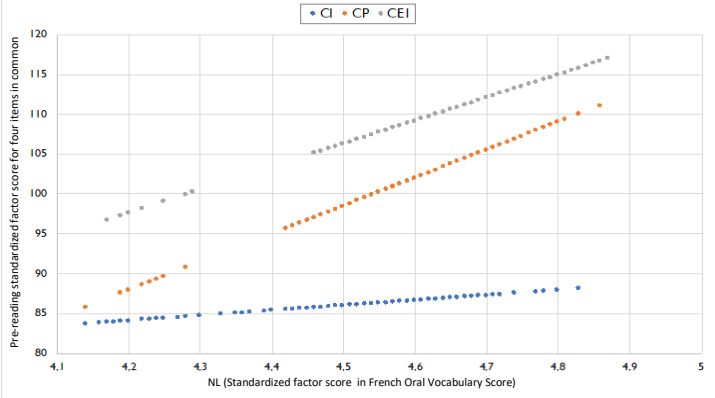
. Their level (CI as reference modality or omitted modality, CP and CE1);
. The oral French vocabulary score they obtained (ln (SCVOCA); here we use the Napierian logarithm[42] (a note of explanation) of the oral French vocabulary score, in order to consider the non-linear relationship between the vocabulary level and the reading or pre-reading level, as we have seen above);
. Two interaction variables (CPlnSCVOCA and CE1lnSCVOCA) between the level and the Napierian logarithm of the oral French vocabulary score (CPlnSCVOCA = CP x ln (SCVOCA) et CE1lnSCVOCA = CE1 x ln (SCVOCA));
. Taking into consideration their characteristics and those of their family environments (CIFAM).

[42]. It is possible that the relationship between the variable to be explained (here, the pre-reading score) and the explanatory variable (here, the vocabulary score) is not linear. One indication of this is that the graphic representation of the relationship between the two variables is not a straight line, but a curve. To the degree that the ordinary least square method (used here) is a linear regression method, which assumes that the modeled relationships are linear, it is then necessary to transform the explanatory variable. Several non-linear transformations are possible, with the one used here being the logarithmic transformation. It proves to be simpler to interpret here, since the analyses take into consideration an interactive effect between two explanatory variables.

The interpretation is then done according to the significance level and the value of each of the coefficients attached to the two interaction variables, as provided by the estimates of the regression model. It emerges from the model that the coefficients attached to the interaction variables are both significant and positive: they attain 29 for that characterizing the CP and 23 for that characterizing the CE1. For better readability, we simulated, on the basis of the regression model coefficients, the scores that would be obtained by the students depending on their class and their level of oral French vocabulary. The results are presented in graph 19 below.

The slope of the three curves is ascending, which indicates a positive and significant effect of oral French vocabulary on the decoding levels in the three classes. The degree of ascendance of the slopes of the curves is, however, variable according to the class. It is moderate at entry into CI: the effect of the level of oral French vocabulary on their decoding level is weaker then. Conversely, it is at entry into CP that the slope of the curve is the most ascendant: it is at this level that the effect of the level of oral French vocabulary on their decoding level is strongest. Therefore, it is crucial that students entering CP have a certain level of oral French vocabulary (a level that we highlighted in the preceding analyses) in order to "maximize" their reading learning. In CE1, the relationship between the level of oral French vocabulary of students and their pre-reading level is equally strong, but less than at entry into CP.

Figure 19: Scores by class and the level of oral French vocabulary



These analyses make it possible to target CI as being the year when students must improve their level of oral French vocabulary (because at the end of this year, once they are in CP, a better level of oral French vocabulary will make it possible for them to attain a better pre-reading level). We will return to this question in the general discussion.

Always from the perspective of explaining the variability of the levels of pre-reading and reading of students, it is important to mobilize factors connected to their academic experience in the year preceding the survey. To do so, we build regression models in which the variable to be explained is the score obtained in pre-reading for CP students and in reading for CE1 students, and the explanatory variables are, in addition to the characteristics of students, of their family environment and of their oral French vocabulary score already examined above (and to which we will not return), the organization modalities of classes and activities implements by the teachers of the year preceding the study. Estimates for CP students are presented in table 52 below.

Table 53: Regression analyses of the pre-reading level of CP students according to certain social variables and learning-teaching conditions in 2017-2018 (considering the characteristics of students and of their family environment, as well as their oral French vocabulary scores)

Variable		Modalities	CP
Constant			110.34***
Characteristics of the class	Size of the class		-0.12 **
	LPT Program	No	ref.
		Yes	6.89 ***
Characteristics of the teacher	Gender	Female	ref.
		Male	-6.01 ***
Teaching activities	Oral expression and comprehension section		-3.02 ***
R^2			28.3%

Among the variables connected to the academic experience of the students, which contribute to the explanation of the variability of their performance on the test, it emerges first of all that the size of the class has a negative effect on the pre-reading level of the students. However, this effect is somewhat moderated: an additional student in the class corresponds to a lowering of the pre-reading scores of students by 0.12 point. In addition, CP students who were in a CI class participating in the Lecture Pour Tous program the year preceding the survey, and who therefore benefitted from hours of teaching reading in a national language, have a pre-reading level greater than (by at least 7 points0 that of students who did not benefit from this system. Among the characteristics of teachers, only their gender makes a difference: students who have a female teacher rather than a male teacher in CI has a slightly better pre-reading level (a little more than 6 points). With regard to the activities implemented by teachers, the analyses show a negative relationship between a greater frequency of activities dedicated to oral expression and comprehension and the pre-reading level of students.

Regarding C#1 (table 53 below), the highest share of variance explained is observed in the reading of French words (33% versus 26% for invented words and those from the NLs). The reading level of the students improves when they have and use a French workbook (same distribution) in CP class. It also increases with the degree of comfort in French of their teacher: scores vary from 99 when their CP teacher self-assesses as not very comfortable in French (degree of 0) to 106 when s/he considers themselves very comfortable in French (degree of 10). Regarding activities implemented by the teachers, the reading level for invented words (and only these) improves with practice of exercises dedicated to coding. In contrast, time spent working on oral language, which has no effect on the reading of invented words, has a more marked positive impact on words from French than on those from the NLs.

Table 54: Regression analyses of the reading scores of CE1 students according to certain social variable and teaching conditions and activities in 2017-2018 (with consideration of their characteristics and of their family environments, as well as their vocabulary score in oral French)

Variable		Modalities	Score on the 10 invented words	Score on the 6 NL words	Score on the 6 words in French	Overall reading score
Constant			108.10 ***	119.00 ***	205.62 ***	110.17 ***
Characteristics of the class	Size of the class		-0.12 **	-	-	-
	French exercise book	No	ref.	ref.	ref.	ref.
		Yes (even shared)	4.27 ***	7.10 ***	5.81 ***	6.29 ***
	Length of the year (in weeks) Length of the year^2 (in weeks)		-	-	-5.91 *** 0.09 ***	-
Characteristics of the teacher	Degree of comfort in French		0.78 ***	-	1.14 ***	0.86 ***
Activities of teaching-learning	Oral language teaching division (no. of minutes)		-	0.02 ***	0.03 ***	0.02 ***
	Reading code learning division		1.59 *	-	-	-
	Reciting from memory division		-	-	-2.9**	-2.11 *
	Conjugation division		-3.69 ***	-2.63 ***	-1.84 *	-2.25 ***
R^2			26.1%	25.9%	32.7%	31.8%

In summary, regarding the variables connected to the academic experience of students, one of the most interesting results is that those in CP who participated in a Lecture Pour Tous program the year preceding the study, and who, therefore, benefited from hours of reading instruction in a national language, have a pre-reading level greater (about 1/2 a standard deviation) than that of students who did not benefit from this practice. At the same academic level, only the gender of teachers had a positive effect (students who had a female teacher in CI have a pre-reading level that is greater by about 1/2 of a standard deviation). In contrast, a negative relationship is revealed between a greater frequency of activities dedicated to oral expression and comprehension and the pre-reading level of students

The main factor that has a positive impact on the reading level of words (invented and frequent) of students observed in CE1 is the use of a French exercise workbook (even shared) in CP class. Regarding activities implemented by the teachers, the practice of exercises dedicated to coding has a positive impact on the reading level of invented words (and only on that) while time spent working on oral language, which has no impact on the reading of these elements, has a positive effect of the reading of French words.

4. SYNTHESIS AND DISCUSSION

4.1. REVIEW OF THE HYPOTHESES

When they must learn to read in their L1, most students have, in this language, an oral language level that makes it possible for them to understand the written language. This is often not the case for those who are learning to read in L2. Therefore, our first hypothesis was that, in order to understand what they are reading in L2, French, Senegalese students must not only be capable of oral understanding of isolated words in this language, but also of sequences of words. Our second hypothesis comprised three sub-parts, the first ($H2^{voc\text{-}lec}$) connected to the first hypothesis. The level of oral vocabulary in French, L2, of the students should increase their level of academic achievement ($H2^{voc}$), along with their pre-reading or reading level ($H2^{lec1}$). These changes should make it possible to discern which degree of mastery of oral language (isolated words and groups of words) best serves to learn to read in this L2 ($H2^{voc\text{-}lec}$).

However, in order to understand a text written in alphabetic writing, first, it is necessary to have a good level of understanding of the oral language in which the reading is to be done and, second, to have internalized decoding, the speed of this internalization depending on the degree of regularity of grapheme-phoneme relationships in the target language. In addition, since the mastery of decoding is a powerful mechanism for self-teaching (which comes from the fact that, when the most regular grapheme-phoneme relationships are acquired, it is much easier to learn those that are less regular), first learning to read in one of the NLs of the children should facilitate this learning in L2, French. In fact, first, the orthography of these NLs (Wolof, Pulaar and Seereer, in our project) is more regular than that of French, which facilitates understanding of grapheme-phoneme relationships and the transfer to a less regular orthography. Second, children master their oral L1 better than French. The results obtained in CE1 in the reading test that contains elements making it possible to examine the mastery of decoding (invented words) and that of the lexical procedure of identification of written words (words from French or the NLs) makes it possible to assess, at this academic level, the preceding predictions. Our third series of hypotheses therefore concerns the relationships between the level of oral vocabulary in French and that of the procedures specific to reading (decoding and lexical procedure of the identification of written words). If CE1 students have recourse to the lexical procedure of the identification of written words, the words from their NL should be easier to read than invented words or French words ($H3^{lec}$). However, the level of oral vocabulary in French should take into consideration reading scores for words in this language ($H3^{voc+lec}$). In addition, academic activities in French around vocabulary and oral comprehension should especially impact on oral French vocabulary ($H4^{voc}$), while the impact of those around coding should be manifested in decoding ($H4^{lec}$). The same is true for participation in the Lecture Pour Tous program ($H4^{lec1}$) which, indirectly, should have a positive impact on the lexical procedure of identification of written French words ($H4^{lec2}$) as well as on the level of oral vocabulary in this language ($H4^{voc+lec}$).

Other factors, related to the students' environment, are likely to influence their oral French vocabulary levels, and their pre-reading or reading levels. Some of these relate to their family environment (H5): oral French vocabulary ($H5^{voc1}$) and reading ($H5^{lec1}$) levels are assumed to be better in students who come from a preferred environment; likewise, in those who have the benefit of having a person at home who spends time talking with them, their learning of new words, or their reading of stories in French, should result in higher oral French vocabulary ($H5^{voc2}$) and reading ($H5^{lec2}$)scores, than those who live in a less preferred environment. Other factors are linked to the school (H6), in particular, the position granted to activities around oral French vocabulary and to those around decoding. The French competences of teachers, understood by their level of training ($H6^{voc1}$ & $H6^{lec1}$) or the perception that they have it ($H6^{voc2}$ & $H6^{lec2}$), are also assumed to have a facilitating effect on the acquisition of oral French vocabulary ($H6^{voc1}$) and on reading in this language ($H6^{lec}$).

4.2. EVALUATION OF THE HYPOTHESES ON THE LEVEL OF ORAL LANGUAGE IN FRENCH AND READING

4.2.1. Vocabulary test (of a word to groups of words)

The hypothesis H1 stipulating that, in order to be able to comprehend what they read in French, students must not only be capable of comprehending isolated oral words, but also sequences of words, is not corroborated. In fact, in the test in which it was required to make simple actions (in response to a question related to a word), then more complex actions (in response to a question involving several words), only 4% of CI students, 10% of CP students and 16% of CE1 students proved capable of going beyond the stated criterion after the simple actions. Therefore, most students assessed had only a limited oral comprehension by word.

In contrast, the first sub-section of the second hypothesis ($H2^{a}$) is corroborated. In fact, the average French oral vocabulary score of the students (which had a mean of 100 and a standard deviation of 15) increases by almost on standard deviation between CI and CP and about 1/2 a standard deviation between CP and CE1. Therefore, it is during the course of the first primary year that the level of oral French vocabulary increased the most.

Additionally, if the level of French oral vocabulary of the students is not very dependent on the context in which they are changing (the variance shares explained are weak and they decrease with academic levels: 27% in CI, 21% in CP and 10% in CE1; cf. table 28), in compliance with hypothesis $H5^{a1}$, the weight of the socio-cultural milieu is significant at three academic levels (5 points or more for students from preferred environments in CP and, respectively, 3 and 4 in CI and CE1). The same is true of the degree of pro-activeness in reading, speaking and learning French words in the family milieu: when these three activities are practiced within the family, the vocabulary level increases by 6 points in CI and CE1 and by 4 in CP. In line with this result, which corroborates hypothesis $H5^{a1}$, watching television in French improves vocabulary level in CI (6 points) and CP (4 points), but not in CE1. The other single factor with an effect on the level of oral French vocabulary is belonging to an urban environment (9 points and more in CI and CP and 8 in CE1).

Finally, contrary to hypothesis $H4^{voc}$, teaching activities in the field of vocabulary and, more broadly, in that of language comprehension, does not have a positive effect on the level of oral French vocabulary. The same emerges from analyses that the students that CE1 students have a better level of oral French vocabulary when, in CP, their teachers have spent more time

working on the teaching of grammar, and less time working on reading comprehension (cf. table 46). In addition, if the time dedicated to these two fields has a significant (positive or negative) effect on the students' vocabulary levels, the content of the activities in these two fields does not[43]. The issue of impact on the vocabulary of academic activities from which the students have benefited is re-examined in section 4.3.2.

4.2.2. Reading test

The second sub-section of the second hypothesis ($H2^{lec}$) is corroborated. In fact, according the results of a decoding test common to the three classes, the improvement is 16 points (a little more than one standard deviation) from CI to CP and 10 points from CP to CE1. It is, therefore, during the course of the first primary year that the decoding level increases the most.

With regard to hypothesis $H3^{lec1}$ relative to the used of the lexical procedure for the identification of written words, it is not corroborated: the difference between the reading scores for invented words and NL words of the same length is not significant. In contrast, this difference is significant between these two scores and that for French words, with, on average, students reading the invented words and the words from their NL a little better than French words. The use of a same procedure for reading invented words and NL words also results from the analysis of the correlations: that between these two reading sub-tests is very high (0.84). These results suggest that students at this academic level largely use one procedure for identifying words, i.e. decoding.

The characteristics of students and of their family environments have only a little impact on their pre-reading level (tables 46 and 47). However, in compliance with hypothesis $H5^{lec1}$, those coming from average families and preferred families have a better reading level than others, but only in CI (about 6 points) and in CP (3 points), not in CE1. The effect of reading practices in the home is always positive (6 points in CI and CP, 5 in CE1), as expected (cf. $H5^{lec2}$). These results, which indicate that students whose parents are more educated and/or have better educational resources, obtain better reading scores, are in compliance with the data of the literature[44].

A single result makes it possible to validate hypothesis $H4^{lec}$ in relation to the effects of academic activities around coding on the results in decoding. In fact, the activities in this field do not have, in CP, any effect on the mastery of decoding assessed by the reading of invented words (table 52). In fact, they have a selective impact on this type of element in CE1, but not on the reading of NL words or of French words (table 53). The reading level also improves in CE1 students when they have and use a French exercise workbook in CP class, and this effect is also manifest with invented words, as well as those from the NL or from French. It also improves, but selectively, on French words when their teachers feel comfortable in this language ($H6^{lec2}$).

One of the results observed in CP[45] makes it possible to validate the hypotheses of $H4^{lec}$. Thus, students who were in a CI class participating in the Lecture Pour Tous program in the year preceding that in which the observations took place, and who benefited from hours of reading

[43]. Other surprising results were revealed: pre-academics had a positive impact only on scores in CP (+ 8 points), not on those of CI or CE1 students; the gender of the students benefits boys (+ 3 points).
[44]. See the study by Braga, Checchi, Garrouste et al. (2019), based on the data from PIRLS.
[45]. Only students at this level were able to benefit from the Lecture Pour Tous program, not those in CE1.

instruction in a national language, have a pre-reading level higher than that of students who did not benefit from this program (about 1/2 of one standard deviation).

Outside of hypothesis $H3^{lec}$ concerning the use of the lexical procedure for the identification of written words and that on the role of activities around decoding on the competences in this field ($H4^{lec}$), all of the effects observed are either in compliance with expectations (the ability to use French exercise workbooks), or with our hypotheses. This is, in particular, the case for the hypotheses on the impact of the socio-cultural milieu and activities around French in the home ($H5^{voc}$ and $H5^{lec}$) and for that on the perception that the teachers have of their degree of mastery of French at the reading level of their students in this language ($H6^{lec}$). The hypothesis regarding the effect of exercises around coding on the decoding results (reading of invented words) is re-examined in the following section (4.3.2.).

4.3. OTHER FACTORS WITH AN IMPACT ON THE ASSESSED CAPABILITIES

Among the factors assumed to have an impact on the level of oral French vocabulary or on that of reading, certain are the sources of contradictory results (those regarding the effects of geographic location), others are counter-intuitive (for example, those on the negative effects of university diplomas), while still others, which were also expected, cannot be systematically separated at the different academic levels (for example, those regarding the use of exercise workbooks). This section examines, sequentially, these different problems.

4.3.1. Contradictory results related to the geographic environment

Among the factors assumed to have an impact on the level of oral French vocabulary which were examined in the three classes, the geographic location is that which caused the greatest difference: students living in an urban milieu obtained an average score greater by 8 to 9 points (more than half of one standard deviation) in relation to those living in rural milieus. Conversely, the pre-reading level of students proved better among those residing in rural milieus, but only in CI, not in CP. The benefit is about 5 points, the gap between the two groups being close to 9 points when they are compared at their level of oral French vocabulary. It is possible to explain the positi8ve effect of living in an urban area on the level of oral French vocabulary by the greater proportion of persons speaking French in the urban milieu than in the rural milieu[46]. In contrast, the beneficial effect on the decoding level, a feature of the rural milieu, is difficult to interpret.

4.3.2. Regarding academic activities

It should be recalled, the years during which the activities targeted in this section were completed are those which precede the assessments (CI for those in CP and CP for those in CE1

4.3.2.1. Vocabulary activities

Activities in French in the family environment have an effect on the level of oral vocabulary in children, regardless of the class. Not very surprisingly, this is not the case with teaching activities around from which the students benefited the year preceding that during which the observations took place. The same emerges from analyses that the students that CE1 students have a better level of oral French vocabulary when, in CP, their teachers have spent more time

[46]. The proportion of parents who state that they are comfortable in French is higher in the urban milieu than in the rural milieu.

working on the teaching of the sentence and grammar, and less time working on reading comprehension (cf. table 46). In addition, if the time dedicated to these two areas has a significant effect (positive or negative) on the vocabulary level of the students, the content of the activities in these two areas does not.

These results are unexpected in two ways. In fact, it is obvious that work on reading comprehension must have an impact on vocabulary. The research work on links between oral vocabulary and comprehension of oral or written language testifies to this[47]. In contrast the links between vocabulary and grammar are poorly documented. These results suggest that, rather than time spent practicing certain activities, it is the quality of the exercises offered that is important. It is very possible that the exercises offered by the teachers in this area are not the most appropriate. Several suggestions, reviewed as reference, are presented at the end of the report.

4.3.2.2. Activities around coding

A single result makes it possible to validate hypothesis $H4^{lec}$ in relation to the effects of academic activities around coding on the results in decoding: that obtained in CE1. In fact, the activities in this field do not have, in CP, any effect on the mastery of decoding assessed by the reading of invented words (table 52). In contrast, they have a selective impact on this type of element in CE1, but not on the reading of words from the NLs or from French (table 53). Activities around coding are however known to systematically have a positive effect on decoding, in L1, and in L2[48].

It is possible to explain this surprising result by the noise introduced by too systematic work on the names of the letters in CI. In fact, all teachers at this academic level conduct activities in this area, every day, for the vast majority (69%), while somewhat fewer in CP conduct daily exercises of this type (60%). If, in order to relate the letters of the alphabet to their corresponding phonemes, it is necessary to know the sounds of these letters, using the names of the letters may hinder the learning of the grapheme-phoneme and phoneme-grapheme relationships for consonants. In fact, a consonant must always be sounded with another element, that is, a vowel: as a result, the names of the consonants of the alphabet are always accompanied by a vowel: "e", as in *be, de, pe, el, er*...; "a" as in *ja*; "a" as in *ka*; "u" as in *qu*... A student who uses this knowledge can therefore read "pea" for "pe" and "dees" for "ds" (or write these two words *pe* and *ds*). This problem highlighted in the Port-Royal grammar text[49], has been the subject of a French study which demonstrated that, if knowledge of the names of the letters for the vowels[50]at age 5 is one of the predictors of the future decoding level three years later (at the end of CE1), this is not the case for the names of the consonants[51]. Which

[47]. See Hoover & Gough (1990); Perfetti (2007); Perfetti & Stafura (2014); Quinn et al. (2015); Tunmer & Chapman (2012).
[48]. For syntheses in L1, see: Castles et al. (2018) and in L2: August & Shanahan (2006) and Murphy (2018); see the reference section as well.
[49] Arnauld & Lancelot (1660).
[50]. What is useful for French is not valuable for all languages, in particular English, a language in which the vowels are not very stable (they are often diphthongs: cf. the pronunciation of "do", see Delattre, 1965). Nonetheless, in English, it has been demonstrated that it is easier to recognize that beech in relation to bone begin with the letter "b" (which is pronounced /be/ in English) or deaf, in relation to loaf, ends in the letter "f" (which is pronounced the same way as in French); see Treiman, Tincoff & Richmond-Welty (1996); see also Treiman & Tincoff (1997).
[51]. See Piquard-Kipffer & Sprenger-Charolles (2013).

explains why, even though knowledge of the alphabet was assessed in the first version of EGRA by a test of identification of the names of the letters, it is now tested by a test related to the sounds of the letters, with this knowledge being directly connected to decoding abilities.[52]

4.3.2.3. An overall view of the effects of academic activities on the assessed competences

As a whole, the lack of impact of the teaching activities implemented on the oral French vocabulary of the students suggest that the questions posed to the students on these aspects are probably not specific enough to illuminate what is happening in class. Doubtless, class observations should have made it possible to better evaluate the durations and content of the teaching activities and to analyze in greater detail their effect on the students' levels of oral French vocabulary, as well as their decoding abilities[53]. Nonetheless, in order to be evaluated, observations of this type must be guided by a solid reference framework, such as that attached to this report, in which suggested activities around vocabulary and a suggested academic progression for learning reading are incorporated.

4.3.3. Regarding the academic achievement of teachers[54]

The data in this area are not very robust. In fact, the results of the students differ as a function of the type of degree of their teachers (university or professional degree) and of the level at which they teach (CI or CP). Thus, only students in CE1 who had, in CP, a teacher with the CAP, have a higher level of vocabulary (on the order of 5 points) than the others (those who had a teacher in CP without pedagogical training, or holders of the CEAP). This is not the case for the CP students. Conversely, holding a university degree has a negative effect on the oral French vocabulary of students, but, once again, only at the academic level: only CP students who had a CI teacher with license or a teaching qualification have an oral French vocabulary level lower than that of students who had a less qualified teacher. This last result, which is frequent in the literature on acquisition assessment for students in Africa[55], is generally explained by the fact that teachers who have obtained a university degree may have more significant professional aspirations than those at a lower level, and therefore, are less motivated. In addition, the university degree level is not a measurement of mastery of the basic knowledge which must be taught in primary school. It is, in fact, necessary to ensure the alignment of the content of their degree and their knowledge.

4.3.4. Regarding means for class organization

It is necessary to recall that these means correspond to the class in which the students were taught the year preceding the assessments (CI for CP students; CP for DE1 students). Increase in class size has a negative effect on the level of oral French vocabulary of the students in CP and in CE1, and on the pre-reading level of those in CP (but not on the reading level of CE1 students). If this effect is, in general, rather limited, it must nonetheless be underlined that there is a high variability of classes at this level, with the number of students per class varying by less than 10 to more than 100. With regard to academic time, a CI year conducted over a range going from 32 to 36 weeks would be optimal, while an optimal duration for a year of CP would

[52]. RTI International (2016).
[53]. See Bressoux (2001).
[54] It should be recalled, the (university or professional) degree is that of the teachers that the students had during the year that preceded the evaluations (CI for those in CP and CP for those in CE1
[55]. Mingat & Suchaut (2000); Bernard, Tyab & Vianou (2004); Michaelowa & Wechtler (2006).

be about 25 weeks. In addition, the interruption of academic activities for more than one month during the CI year has a negative effect on the level of oral French vocabulary (of about 8 points), which does not exist for CE1 students. In contrast, the duration of the academic year has no effect on the students' reading levels.

These results indicate that students need a longer and more continuous time in CI than in CP in order to improve their level in oral French vocabulary. They also suggest that it would be good to limit the enrollment in CI classes, which should have a positive impact on the level of oral French vocabulary of students, as well as their NL reading level. However, it would be interesting to ultimately analyze the effective teaching time from which the students benefit, by taking into consideration, for example, the operating time of each school, the frequency and duration of absenteeism of the teachers and students, or even the instruction time devoted to each activity[56].

4.4. IMPLICATIONS OF THE STUDY RESULTS FOR EDUCATION POLICIES

4.4.1. Implications of the results related to the central study questions

4.4.1.1. Beginning when can one begin to learn to read in L2, French?

One of the principal objectives of this study was to evaluate the level of mastery of oral French vocabulary of students in the first three years of primary school in order to define the most appropriate moment to begin teaching reading in this language. First, a stage at the beginning of CE1 came to light. At this moment, first, the decoding level attained by the students (reading of invented words or of frequent words from French or from their NL) increases greatly when their level of oral French vocabulary has attained a certain threshold (cf. figure 16) and, second, the great majority of students (93%) then have a level of oral French vocabulary sufficient to be translated positively to their decoding levels. It also emerges from analyses that the level of oral French vocabulary then more effectively explains the reading scores for French words than those for invented words or NL words. These results make a first response to our hypothesis **H2^{c} possible: beginning from the start of CE1, it is possible to begin to learn to read isolated words in French.**

However, the vocabulary level of CE1 students is still not sufficient to enable them to comprehend written texts: nearly 85% of them are, in face, incapable of understanding a sequence or French words presented orally. It is well understood that this is not the case for students whose L1 is French: upon entry into primary school (CP in France) almost all are capable of understanding oral sentences of 4 to 9 words[57]. The results of this study allow us to suggest that comprehension of written L2 French with Senegalese students occurs at the beginning of CE1, by using French texts read by the teacher. This is what is proposed by some researchers with regard to the reading of French L1 texts in CP.

4.4.1.2. Beginning when is it possible to work on oral French L2 vocabulary?

Analyses make it possible to target CI as being the most propitious class for working intensively on oral French vocabulary. In fact, the results presented in section D.3.4 indicate that students need a longer and more continuous time in CI than in CP in order to improve their level of

[56]. See Abdazi (2007).
[57]. See, for example, Gentaz et al. (2013); Lecocq (1996).

oral French vocabulary It is, therefore, in CI that it would be necessary to intensify activities around oral French vocabulary, by not limiting them to work on isolated words (see, for activities suggestions, section D.4.2.1). This work must be extended to CP so that the level of oral French vocabulary upon entry into CE1 makes it possible to begin reading learning in this language under good conditions.

4.4.2. Other implications of the study results for education policies

The next two sections include several suggestions regarding what should be presented to teachers during their training (initial and continuous) in order to make it possible for them to intensify, and diversify, teaching activities around the two pillars of reading learning: oral comprehension (from the isolated word to the sequence of words) and specific procedures for reading: the lexical identification of written words and decoding.

4.4.2.1. Oral and written comprehension

The following suggestions relate to both the oral and the written, as well as to isolated words or sequences of words that can be inserted into a sentence. In fact, as indicated in the reference section, on one hand, the comprehension of oral language is largely similar to that of written language. On the other hand, work on the sentence is not limited to grammar[58].

The study made it possible to note that, while activities around the French language in the family environment have an effect on all classes on the children's level of oral vocabulary[59], this is not the case for academic activities. It would therefore be desirable to present to teachers, during their training (initial and continuous), the different facets of vocabulary in order to enable them to intensify and diversify vocabulary exercises.

As explained in the reference section, words are identified by their belonging to a grammatical category (noun, verb, pronoun...) and to a semantic category (the *dog* is an animal). At the semantic level, the relationships can be of several types: equivalence relationships (synonymity: *auto* or *car*) or opposition relationships (antonymy: *good* versus *bad*, *beginning* versus *end*). They can also be functional (the *hammer* is used to pound in nails) or categorical and, in this case, hierarchical: hypernymy (going from the specific to the general: from cat to animal) or hyponymy (going from the general to the more specific: the cat is a Siamese).

The meanings of words can also be literal (the *stopper* of the bottle) or derived (the *stopper* that stops traffic) In addition, while certain words have only a single meaning, others have several. Several "polysemic" words don't have a semantic relationship: such as "*avocat*" which is a fruit or a profession, that of the person who defends an accused (and who, to do so, *speaks*, cf. the root *voc-*, which is found in *vocabulary* and *vowel*). Others have semantic relationships: "*pastry*" (for a pie and "*pasta*" (Bolognese style), as different from the "*pattes*" [paws] of a dog. In a dictionary, the words from the first category (the two *avocats*) are presented in two different entries while those from the second (the two *pastes*) are most often in one and the same entry.

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[58]. See for example, Lecocq (1996a) and Lecocq, Casalis, Leuwers et al. (1996b).

[59]. As has been demonstrated in other studies. For example, according to a study in which the time dedicated each day to reading outside of school by 10 and 11 year old American students was examined, it is estimated that the weakest readers (10th percentile) see 60,000 words per year, while the best readers (90th percentile) se more than 4 million (Anderson, Wilson & Fielding, 1988).

There are also complex lexical units which can contain two nouns (*garbage barge*), a noun and an adjective (*red breast*) or a verb and a noun (*guardrail*). They can also include a preposition between two nouns (*jack-in-the-box*) or two verbs (*see-and-say*). What is specific to most of these units is that their meaning cannot be reduced to each of the words that they comprise: thus, guard rail is a railing that prevents people from falling, and not an individual guarding rails.

Another component that is crucial in a bilingual context is that the scope of vocabulary in certain areas depends on the environment. Thus, in African languages, the probability that the word *snow* would be frequent is low, just as is that of finding specific words to specify the nature of the snow. In contrast, there may be numerous terms in these languages that mean *walking.* Thus, in Shona[60], about 200 words designate ways of walking *(backwards, with a cane, with long strides, over a long distance, kicking up dust, with one's back hunched...).* These linguistic differences related to cultural factors must be taken into consideration in bilingual teaching. The same is true for figurative expressions (such as *it's raining buckets*)[61], which are often very different from one language to another.

4.4.2.2. Specific reading procedures: from decoding to lexical procedures

While the study results indicate that, by sensitizing children to the French language and to the reading of this language in the family environment, we can improve their pre-reading levels, activities around coding at school which only have a very limited effect on reading results in children, with this effect having only come to light in the reading of invented words by CE1 students. This is a very surprising result. In fact, we now know (cf. the results of more than 30 years of research)[62] that, in both L1 and L2, systematic, intensive and early work on this type of activity has an effect on the mastery of decoding and, as a result, on the internalization of the lexical procedure of the identification of written words. This internalization makes it possible, in return, for the reader to dedicate her cognitive resources to the comprehension of what she is reading.

It would therefore be desirable to present to teachers, during their training (initial and continuous) the results of research studies on the competences which must be developed in students in order to facilitate their learning to read in alphabetic writing, and to do so in order to make their academic practice more efficient. The reference section attached to this report contains a progression suggestion for learning to read in French. This progression takes into account the frequency of words in this language as well as that of the grapheme-phoneme correspondences and their regularity. It also takes into consideration the specific principles of this orthography, with the major portion being connected to morphology[63], since numerous written marks are absent orally (*ami*/*amie*...) or are homophones (tear, tare...).[64] It would also be necessary to adapt this progression to the specificities of the NLs in which the students of Senegal are going to begin their reading learning.

[60]. Nancarrow (2004).
[61]. Regarding French figurative expressions Caillies (2009).
[62]. See, for example, the English syntheses of Castles (2018) and of Clifton et al. (2016); in French, see Dehaene et al. (2011); Sprenger-Charolles & Desrochers (2018).
[63]. See, for example, Casalis & Colé (2018) and Peereman & Sprenger-Charolles (2018).
[64]. For a selection of digital tools in this area, see Lassault & Ziegler (2018)

4.5. SEVERAL LIMITATIONS OF THIS STUDY

The explanatory power of the variables which have an impact both on the vocabulary level in L2, French, and on pre-reading or reading, is rather weak. Furthermore, certain factors have been integrated into the models, without their addition making any significant difference in the explanation of the variability of student levels, both in oral French vocabulary and in pre-reading or reading. This is specifically the case for their linguistic environment. Numerous questions have been posed to students and to their parents in order to attempt to characterize this environment: mother tongues spoken at home, with friends, etc. Only difference of a family environment of plurilingualism versus monolingualism has been able to be accounted for due to the very small number of students speaking only Pulaar or Seereer in their daily lives. This variable has been proven to have no impact on the assessed competences. It would, doubtlessly, have been interesting to have had a larger sample of students, in order to be able to examine possible links between the specificities of children and their level of oral French vocabulary.

Finally, as already stated (in section 4.4.1.3), there was no evaluation of the level of NL oral vocabulary in students, which is regrettable. In fact, this evaluation would have made it possible to better respond to one of the critical questions in education policy: that of the most propitious moment for introducing reading learning in an NL.

4.6. IN CONCLUSION

The results of this study make it possible to posit that, at the beginning of CE1, comprehension of written language in French should be, in particular, addressed orally, using texts read by the teacher, in particular stories, because texts of this type make it possible, when they are read several times, to construct a collective memory and, thereby, a collective culture[65]. These re-readings also make it possible to familiarize the students with the specificities of written French. It is well understood that the comprehension of French must also be worked on orally using different communication situations, including exchanges in class regarding texts that have been read by the teacher.

This study made it possible to validate numerous results against the data of the international literature. This is the case for those that indicate the positive impact of the socio-cultural milieu on the level of French vocabulary. More interesting is the observation of the positive effects, at this level, of activities practiced within the family (reading, speaking and learning French words with the child), activities which should be supported. The same is true for data regarding the participation of students in the "Lecture Pour Tous" (LPT) program, who therefore benefited from hours of reading instruction in a national language. These students thereby have a French reading and vocabulary level greater than half of a standard deviation than those who did not benefit from this experience.

[65]. Bruner (2002).

Beyond the Lecture Pour Tous program, what emerges from evaluations of the effects of teacher practices on student results, for both vocabulary and reading, is deceptive. These results indicate that it is necessary to improve the training (initial and continuous) of teachers in order to enable them to intensify, and diversify, academic activities around French oral comprehension (from word to text), with an appropriate reference framework. The same is true with regard to learning written code, in the NLs of the children, and in French. Activities in this area should be systematic, intensive and early, with beginning writing being done first in the students' NLs because they master this language better orally than French. In addition, most of the NLs of Senegal have a more regular orthography than that of French, with will facilitate the learning of grapheme-phoneme correspondences and the transfer to a less regular orthography: that of French. What the results of students who have participated in the Lecture Pour Tous program suggest is positive.

In order to exceed certain limitations of this project, it would be beneficial to be able to conduct new investigations. On one hand, it would be necessary to ensure that, in CE2, the oral French comprehension (words and groups of words) level of students is sufficient to enable them to comprehend what they are reading in this language. On the other hand, it would be necessary to be able to verify the relationships in the students' NL, between the level of oral vocabulary and the reading level.

5. BIBLIOGRAPHY

Abadzi, H. (2007). *Absenteeism and Beyond: Instructional Time Loss and Consequences*. Washington DC: World Bank.

Anderson R. C., Wilson P. T. & Fielding L. G. (1988). Growth in reading and how children spend their time outside of school. *Reading Research Quarterly,* 23, 285–303. doi:10.1598/rrq.23.3.2

Arnauld A. & Lancelot C. (1660). *Grammaire générale et raisonnée de Port-Royal*. Paris: Bossange et Masson (Second edition, 1810).

August D. & Shanahan T. (2006). *Developing literacy in second-language learners*. Washington, DC: Lawrence Erlbaum Associates and the Center for Applied Linguistics.

Baudelot C. & Establet R. (2009), *L'élitisme républicain. L'école française à l'épreuve des comparaisons internationales*, Paris: Seuil

Broccolichi S. & Sinthon R. (2011). Comment s'articulent les inégalités d'acquisition scolaire et d'orientation ? Relations ignorées et rectifications tardives. *Revue Française de Pédagogie, 175, 15-38.*

Bernard J.-M., Tiyab K., Vianou K. (2004). *Profils enseignants et qualité de l'éducation primaire en Afrique subsaharienne francophone: Bilan et perspectives de dix années de recherche du PASEC*. Dakar: PASEC/CONFEMEN.

Braga M., Checchi D., Garrouste C. et al. (2019). *Selecting or Rewarding Teachers? International Evidence from Primary Schools*, IZA DP 12200 https://www.iza.org/publications/dp/12200/selecting-or-rewarding-teachers-international-evidence-from-primary-schools

Bressoux P. (2001). Réflexions sur l'effet-maître et l'étude des pratiques enseignantes. *Les dossiers des sciences de l'éducation*, 5, pp. 35-52.

Bruner J. (2002). *Pourquoi nous racontons-nous des histoires*. Paris: Retz.

Caillies S. (2009). Descriptions de 300 expressions idiomatiques, *Année Psychologique*, 109(3), 463-508.

Casalis S. & Colé P. (2018). Le morphème, une unité de traitement dans l'acquisition de la litéracie, *Langue française*, 199, 69-81.

Castles A., Rastle K. & Cain K. (2018). Ending the Reading Wars: Reading acquisition from novice to expert. *Psychological Science in the Public Interest*, 19(1), 5-51 [http://journals.sagepub.com/doi/abs/10.1177/1529100618772271].

Charolles M. (1995). Cohésion, Cohérence et pertinence du discours. *Travaux de Linguistique,* 29, 125-151.
Clifton C. Jr., Ferreira F., Henderson J. M. et al. (2016). Eye movements in reading and information processing: Keith Rayner's 40 years legacy. *Journal of Memory and Language*, 86, 1-19

Currie N. K. & Cain K. (2015). Children's inference generation: The role of vocabulary and working memory. *Journal of Experimental Child Psychology*, 137, 57–75

Deacon S. H., Desrochers A. & Levesque K. (2017). *Learning to Read French*. in L. Verhoeven & C. Perfetti (eds.), Learning to Read across Languages and Writing Systems (pp.243-269), Cambridge University Press.
Dehaene S. (Dir) (2011). *Apprendre à lire. Des sciences cognitives à la salle de classe*. Paris: Odile Jacob.

Dehaene S. (Dir) (2019). La science au service de l'école (Chapitre 2: Evaluer pour mieux aider, pp. 85-158), Odile Jacob.

Delattre P. (1965). *Comparing the phonetic features of English, French, German and Spanish*. Heidelberg: Jumius Gross Verlag.

Deltour J.J. & Hupkens D. (1980). *Test de vocabulaire actif et passif pour enfants de 5 à 8 ans* (TVAP 5-8). Braine-le-Château: Editions de l'Application des Techniques Modernes.

Dunn L. M., Thériault-Whalen C. M. & Dunn L. M. (1993). *Echelle de vocabulaire en image du Peabody*. Psycan, Toronto.

Early Literacy Panel (2008). *Developing early literacy: A Scientific Synthesis of Early Literacy Development and Implications for Intervention* http://lincs.ed.gov/publications/pdf/NELPReport09.pdf

Fayol M. (2017). *L'acquisition de l'écrit*. Paris: Presses Universitaires de France.

Gentaz E., Sprenger-Charolles L., Theurel A. et al. (2013). Reading comprehension in a large cohort of

French first graders from low socio-economic status families: A 7-month longitudinal study. *Plos ONE*, 8(11): e78608.2.

Gentaz E., Sprenger-Charolles L. & Theurel A. (2015). Differences in the predictors of reading comprehension in first graders from low socio-economic status families with either good or poor decoding skills. *PLoS ONE.* 10(3): e0119581.

Gernsbacher M., Varner K. & Faust M. (1990). Investigating differences in general comprehension skills. *Journal of Experimental Psychology: Learning, Memory and Cognition*, 16, 430-445.

Hoff E. (2006). How social contexts support and shape language development. *Developmental Review* 26: 55–88.

Hoover W. A. & Gough P. B (1990). The simple view of reading. *Reading and Writing: An Interdisciplinary Journal,* 2, 127-160.

Kolinsky R., Morais J., Cohen L. et al. (2018). Les bases neurales de l'apprentissage de la lecture, *Langue française,* 199, 17-33.

Lassault J. & Ziegler J.C. (2018). Les outils numériques d'aide à l'apprentissage de la lecture. *Langue française*, 199, 111-121

Lecocq P. (1996a). *ECoSSe (Epreuve de Compréhension Syntaxico-Sémantique)*. Lille: Presses du Septentrion.

Lecocq P., Casalis S., Leuwers C. et al. (1996b). *Apprentissage de la lecture et compréhension d'énoncés*. Lille: Presses universitaires du Septentrion.

Lété B, Sprenger-Charolles L., & Colé P. (2004). MANULEX: A lexical database from French readers. *Behavioral Research Methods, Instruments and Computers*, 36(1), 156-166. http://www.manulex.org/.

Michaelowa, K., Wechtler, A. (2006). *Coût-efficacité des intrants de l'enseignement primaire: ce que nous apprend la documentation et des récentes enquêtes sur les étudiants en Afrique subsaharienne*. Papier présenté à la Biennale de l'ADEA, Libreville, Gabon.

Mingat A., Suchaut B. (2000). *Les systèmes éducatifs africains: une analyse économique comparative.* Bruxelles: De Boeck.
Murphy V. A. (2018). *Literacy development in linguistically diverse pupils.* In D. Miller et al. (Eds.), Bilingual cognition and language: The state of the science across its subfields. Studies in Bilingualism (Vol. 54, pp. 155–182). Amsterdam, The Netherlands: John Benjamins. doi:10.175/sibil.54.08mur

Nancarrow O. (2004). *L'Afrique*. In B. Comrie, S. Matthews & M. Polinsky (Eds). Atlas des langues: L'origine et le développement des langues dans le monde (pp.72-89). Paris, Edition Acropole.

National curriculum in England (2013). *English programs of study: key stages 1 and 2.* National archives https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/335186/PRIMARY_national_curriculum_-_English_220714.pdf

Noble K.G. & McCandliss B.D. (2005). Reading development and impairment: behavioral, social, and neurobiological factors. *Journal of Developmental and Behavioral Pediatrics* 26: 370–378.

Peereman R. & Sprenger-Charolles L. (2018). Manulex-MorphO, une base de données sur l'orthographe du français intégrant les morpho-phonogrammes. *Langue Française*, 199.

Perfetti C. A. (2007). Reading Ability: Lexical Quality to Comprehension. Scientific Studies of Reading 11(4):357-383.

Perfetti C. A. & Stafura J. (2014). Word knowledge in a theory of reading comprehension. *Scientific Studies of Reading,* 18, 22–37.

Piquard-Kipffer A. & Sprenger-Charolles L. (2013). Early predictors of future reading skills: A follow-up of French-speaking children from the beginning of kindergarten to the end of the second grade (age 5 to 8). *Topics in Cognitive Psychology – L'Année Psychologique,* 113, 491-52Z.

PIRLS [Progress in International Reading Literacy Study] (2017). *PIRLS 2016*. IEA [International Association for the Evaluation of Educational Achievement]. http://www.iea.nl/pirls.

Quinn J. M., Wagner R. K., Petscher Y. et al. (2015). Developmental relations between vocabulary knowledge and reading comprehension: A latent change score modeling study. *Child Development, 8*6, 159–175.

Riou J. & Fontanieu V. (2016). Influence de la planification de l'étude du code alphabétique sur les performances des élèves en décodage au cours préparatoire. *Revue française de pédagogie.* 196, 49–66. https://doi.org/10.4000/rfp.5073

Rose J. (2006). *Independent review of the teaching of early reading final report.* U.K. Department for Education and Skills.

RTI International (2016). *Manuel pour l'évaluation des compétences fondamentales en lecture* (Adapation au français de EGRA [Early Grade Reading Assessment], 2nd édition). Washington, DC, United States Agency for International Development
https://www.globalreadingnetwork.net/sites/default/files/resource_files/EGRA_Toolkit_2nd_Ed_French-Final.pdf

Share D. L. (1995). Phonological recoding and self-teaching: Sine qua non of reading acquisition. *Cognition*, 55, 151-218.

Sprenger-Charolles L. (2008). *Rapport sur l'étude pilote EGRA Sénégal,* Banque Mondiale

Sprenger-Charolles L. & Desrochers A. (Eds.) (2018). Lire-Ecrire: des savoirs scientifiques aux savoirs pratiques. *Langue Française*, 199, 3.

Sprenger-Charolles L., Siegel L. S., Béchennec D. et al. (2003). Development of phonological and orthographic processing in reading aloud, in silent reading and in spelling: A four-year longitudinal study. *Journal of Experimental Child Psychology,* 84, 194-217.

Torgesen J. K. (2009). The Response to Intervention Instructional Model: Some Outcomes from a Large-scale Implementation in Reading First Schools. *Child Development Perspectives*, 3(1), 38-40.

Treiman R., Tincoff R. & Richmond-Welty E. D. (1996). Letter names help children to connect print and speech. *Developmental Psychology, 32*(3), 505–514. https://doi.org/10.1037/0012-1649.32.3.505

Treiman R. & Tincoff R. (1997). The fragility of the alphabetic principle: Children's knowledge of letters names can cause them to spell syllabically rather alphabetically. *Journal of Experimental Child Psychology, 64*, 425–451.

Tunmer W.E. & Chapman J.W. (2012). Does set for variability mediate the influence of vocabulary knowledge on the development of word recognition skills? *Scientific Studies of Reading,* 16(2), 122-140.

Ziegler J. C. (2018). Différences inter-linguistiques dans l'apprentissage de la lecture, *Langue française*, 199, 35-49.

6. ANNEXES

6.1. EVALUATION PROTOCOL

GIVE THE INSTRUCTIONS IN THE NATIONAL LANGUAGE EXCEPT FOR THE WORD THAT THE ITEM SEEKS TO ASSESS, WHICH MUST, IMPERATIVELY, REMAIN IN FRENCH

Handover instructions	Duration	Grading scale

1. Passive oral vocabulary: designation of images (isolated words)

Section 1

Planche 1

General instructions / Test
Look carefully at these images. Show me the <u>mouth.</u>
Show me the action of <u>pushing</u>.

Item 1.1.1				
Look carefully at these images. Show me the **<u>car</u>**.	15 seconds	0 Incorrect response	1 Correct response	9 No response
Item 1.1.2				
Show me the **<u>cake</u>**.	15 seconds	0 Incorrect response	1 Correct response	9 No response

Item 1.1.3				
Show me the picture that shows the action of **opening**.	15 seconds	0 Incorrect response	1 Correct response	9 No response
Item 1.1.4				
Show me the **bed.**	15 seconds	0 Incorrect response	1 Correct response	9 No response
Item 1.1.5				
Show me the **table.**	15 seconds	0 Incorrect response	1 Correct response	9 No response

Item 1.1.6: Stop if the child has only given 1 correct answer. out of 5 items => go to section 2	0 Not applicable	1 Applicable

Section 2

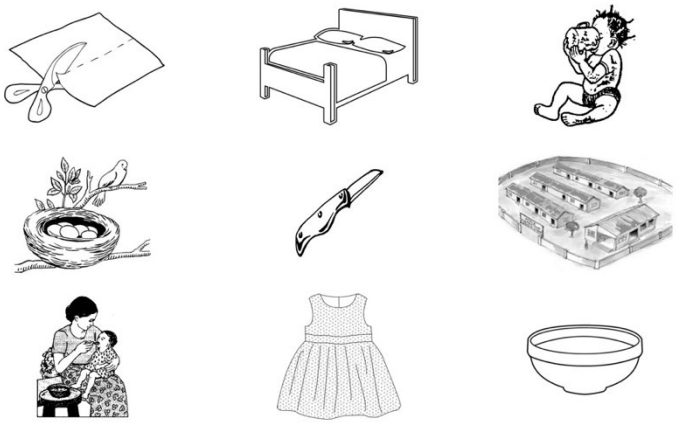

Planche 2

Item 1.2.1				
Look carefully at these images. Show me the **ball.**	15 seconds	0 Incorrect response	1 Correct response	9 No response
Item 1.2.2				
Show me the action of **drinking**.	15 seconds	0 Incorrect response	1 Correct response	9 No response
Item 1.2.3				
Show me the **school.**	15 seconds	0 Incorrect response	1 Correct response	9 No response
Item 1.2.4				
Look carefully at these images. Show me the **nest.**	15 seconds	0 Incorrect response	1 Correct response	9 No response
Item 1.2.5				
Look carefully at these images Show me the **dress.**	15 seconds	0 Incorrect response	1 Correct response	9 No response

Item 1.2.6: Stop if the child has only given 1 correct answer. out of 5 items => go to section 2	0 Not applicable	1 Applicable

Section 3

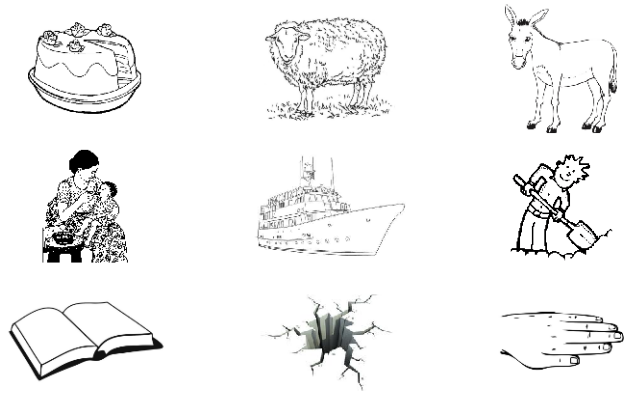

Planche 3

Item 1.3.1				
Look carefully at these images. Show me the action of **eating**.	15 seconds	0 Incorrect response	1 Correct response	9 No response
Item 1.3.2				
Show me the **boat**.	15 seconds	0 Incorrect response	1 Correct response	9 No response
Item 1.3.3				
Show me the **sheep**.	15 seconds	0 Incorrect response	1 Correct response	9 No response
Item 1.3.4				
Show me the **book**.	15 seconds	0 Incorrect response	1 Correct response	9 No response
Item 1.3.5				
		0	1	9

Show me the action of **digging.**	15 seconds	Incorrect response	Correct response	No response
Item 1.3.6				
Show me the **hand.**	15 seconds	0	1	9
		Incorrect response	Correct response	No response

Item 1.3.7: Stop if the child has only given 1 correct answer. out of 6 items => go to section 2	0	1
	Not applicable	Applicable

Section 4

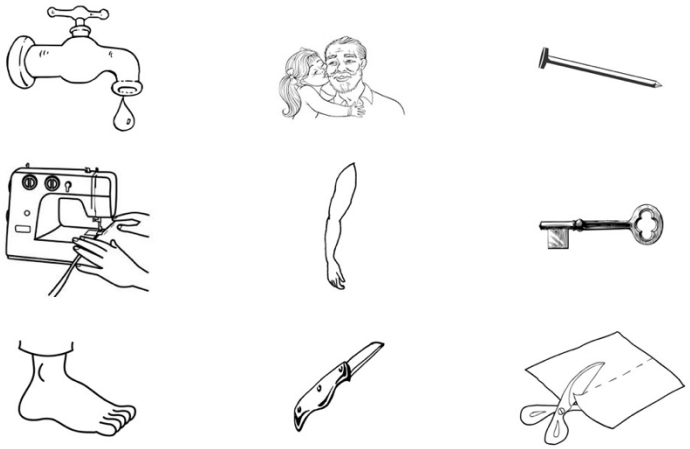

Planche 4

Item 1.4.1				
Look carefully at these images. Show me the **faucet**.	15 seconds	0	1	9
		Incorrect response	Correct response	No response

Item 1.4.2				
Show me the **arm**.	15 seconds	0 Incorrect response	1 Correct response	9 No response
Item 1.4.3				
Show me the action of **sewing.**	15 seconds	0 Incorrect response	1 Correct response	9 No response
Item 1.4.4				
Show me the **key.**	15 seconds	0 Incorrect response	1 Correct response	9 No response
Item 1.4.5				
Show me the **knife.**	15 seconds	0 Incorrect response	1 Correct response	9 No response
Item 1.4.6				
Show me the action of **cutting.**	15 seconds	0 Incorrect response	1 Correct response	9 No response

2. Active oral vocabulary: isolated words and words in context

Items 2.1: The days of the week (6 points + 1 stop item)

Item 2.1.1				
I am going to ask you questions about the days of the week. Which day comes after **Monday**?	10 seconds	0 Incorrect response	1 Correct response	9 No response
Item 2.1.2				
Which day comes after **Tuesday**?	10 seconds	0 Incorrect response	1 Correct response	9 No response

Item 2.1.3: Stop if the child has not given any answer =>	0	1
Go to section 2.2	Not applicable	Applicable

Item 2.1.4				
Which day comes after **Wednesday**?	10 seconds	0	1	9
		Incorrect response	Correct response	No response
Item 2.1.5				
Which day comes after **Thursday?**	10 seconds	0	1	9
		Incorrect response	Correct response	No response
Item 2.1.6				
Which day comes after **Friday?**	10 seconds	0	1	9
		Incorrect response	Correct response	No response
Item 2.1.7				
Which day comes after **Saturday?**	10 seconds	0	1	9
		Incorrect response	Correct response	No response

Items 2.2: The parts of the body (7 points + 1 stop item)

Item 2.2.1					
Show me your **nose**.	10 seconds	0	1		9
		Incorrect answer	Correct answer		No answer
Item 2.2.2					
Show me your **mouth.**	10 seconds	0	1		9
		Incorrect answer	Correct answer		No answer
Item 2.2.3					
		0	1		9

Show me your **tongue.**	10 seconds	Incorrect answer	Correct answer		No answer
Item 2.2.5					
Show me your **neck.**	10 seconds	0 Incorrect response	1 Correct response		9 No response
Item 2.2.6					
Show me your **right hand**.	15 seconds	0 Incorrect answer	1 Shows the left hand	2 Shows the right hand	9 No answer
Item 2.2.7					
Show me your **left elbow**.	15 seconds	0 Incorrect answer	1 Shows the right elbow.	2 Shows the left elbow.	9 No response
Item 2.2.8					
Show me your **right shoulder**.	15 seconds	0 Incorrect response	1 Show me your left shoulder.	2 Show me your right shoulder.	9 No response

Items 2.3: Action verbs (8 points)

Item 2.3.1				
I will ask you to do some actions. I will ask you **to laugh**.	10 seconds	0 Incorrect response	1 Correct response	9 No response
Item 2.3.2				
I will ask you **to cough**.	10 seconds	0 Incorrect response	1 Correct response	9 No response

Item 2.3.3: Stop if the student has not given any answer. **End of this section of the test: go to section 3 (Reading)**	0 Not applicable	1 Applicable

Item 2.3.4				
I will ask you to draw a **line** with your finger.	10 seconds	0 Incorrect response	1 Correct response	9 No response
Item 2.3.5				
I will ask you to draw a **cross** with your finger.	10 seconds	0 Incorrect response	1 Correct response	9 No response
Item 2.3.6				
I will ask you to **breathe** heavily.	10 seconds	0 Incorrect response	1 Correct response	9 No response
Item 2.3.7				
I will ask you to make a **funny face**.	10 seconds	0 Incorrect response	1 Correct response	9 No response

Items 2.4: Space - Time (8 points)

Item 2.4.1					
Here, I will give you an object. Put this object **in front of you**.	15 seconds	0 Act, but do not put the stone in front of her	1 Put the stone in front of her		9 No response
Item 2.4.2					
Now, put this object **in front of me.**	15 seconds	0 Act, but do not put the stone behind me.	1 Put the stone in front of me.		9 No response
Item 2.4.3					
Now put the stone **behind you.**	15 seconds	0 Act, but do not put the stone behind him	1 Put the stone behind him		9 No response
Item 2.4.4					

Now, put this object **next to me.**	15 seconds	0 Act, but do not put the stone next to me	1 Put the stone next to me		9 No response
Item 2.4.5					
Now, put this object **far from me.**	15 seconds	0 Act, but do not put the stone far from me	1 Put the stone far from me		9 No response
Item 2.4.6					
Now, put this object **in your right hand.**	15 seconds	0 Act, but do not put the stone in one of his hands	1 Put the stone in his left hand	2 Put the stone in his right hand	9 No response

3. Pre-reading and reading test

Only for CI and CP students						
I am going to ask you to read small parts of words. I will show you an example. **Show the letter "o" and say "o". Now it's your turn.** **If the student does not answer after 3 seconds, go to the next item.**						
Item	**"Parts" of words to read**	**Incorrect answer**	**The student makes a**	**Correct answer**	**No answer**	
3.1.1	a	0	1	2	9	
3.1.2	i	0	1	2	9	
3.1.3	é	0	1	2	9	
3.1.4	o	0	1	2	9	
3.1.5	Stop if the child has not read any of the letters					99
3.1.6	sa	0	1	2	9	
3.1.7	la	0	1	2	9	
3.1.8	dé	0	1	2	9	
3.1.9	ti	0	1	2	9	

Only for CE1 students
I am going to ask you to read some small parts of words. I will show you an example. **Show the letter "o" and say "o". Now it's your turn.** **The test takes 1 minute and 30 seconds.** **If the student has not answered after 3 seconds, go to the next item.**

Item	Word to read	Incorrect answer	The student makes a mistake but self-corrects.	Correct answer	No answer	Stop at the end of 1 minute 30 seconds
3.2.1	Sa	0	1	2	9	99
3.2.2	La	0	1	2	9	99
3.2.3	Dé	0	1	2	9	99
3.2.4	Ti	0	1	2	9	99
3.2.5	Al	0	1	2	9	99
3.2.6	Fo	0	1	2	9	99
3.2.7	Tifo	0	1	2	9	99
3.2.8	Lato	0	1	2	9	99
3.2.9	Tafi	0	1	2	9	99
3.2.10	Sabol	0	1	2	9	99
3.2.11	Daba	0	1	2	9	99
3.2.12	Oto	0	1	2	9	99
3.2.13	Bato	0	1	2	9	99
3.2.14	Foto	0	1	2	9	99
3.2.15	Mati	0	1	2	9	99
3.2.16	Alima	0	1	2	9	99
3.2.17	Bal	0	1	2	9	99
3.2.18	Ami	0	1	2	9	99
3.2.19	Midi	0	1	2	9	99
3.2.20	Kilo	0	1	2	9	99
3.2.21	Moto	0	1	2	9	99
3.2.22	Mali	0	1	2	9	99

6.2. STUDENT QUESTIONNAIRE

1. Elementary school and student identification

1. School name:	2. Code:

3. IA	4. IEF	5. Commune

6. First name	7. Surname	8. Class	9. Code

2. Questions on the child's linguistic environment

10. What language do you speak at home? *Several possible answers.*				
Pulaar	Seereer	Wolof	French	Other: .....

11. What language do you speak with your friends? *Several possible answers.*				
Pulaar	Seereer	Wolof	French	Other: .....

12. What language do you speak with your teacher? *Several possible answers.*				
Pulaar	Seereer	Wolof	French	Other: .....

13. Do you watch television?	Yes	No (go to the next question ...)

14. If yes, in which language(s) are the shows you watch? *Several possible answers.*				
Pulaar	Seereer	Wolof	French	Other: .....

15. Is there at least one person in the home who knows how to read?	Yes	No	I don't know

16. Do you look at or read books with this person?	Yes	No

17. Are there books that you can look at/read at home?	Yes	No

18. If yes, do you spend time looking at or reading these books?				
No, not at all	Once per month	Several times per month	Several times per week	Every day

19. Is there at least one person in the home who speaks French?	Yes	No	I don't know

20. If yes, do you speak French with them?				
No, not at all	Once per month	Several times per month	Several times per week	Every day

21. If yes, does this person teach you things in French (words, expressions...)?				
No, not at all	Once per month	Several times per month	Several times per week	Every day

6.3. STUDENT'S PARENT'S QUESTIONNAIRE

1) What is your child's name? .....

2) What gender is your child?

Boy	Girl

3) What is their date of birth?

Day:	Month:	Year: .....

4) Which class does your child currently attend?

CI (go to question 6)	CP	CE1

5) If your child is taught in CP or in CE1, was s/he taught in the same school last year?

Yes	No

6) Before going to elementary school, did your child go to pre-school?

Yes	No (go to question 8)

7) If yes, how many years did s/he go for? And what type of pre-school?

Less than 1 year	1 year	2 years	3 or more years

Community	Kindergarten	Nursery school	Pre-school			Pre-primary school	Daara pre-school
			Public	Private	Franco-Arab Private		

8) Does your child live with both parents?

Yes	No, with his/her mother	No, with his/her father	No, neither of them

9) Does your child have brothers or sisters with whom s/he lives? *Several possible answers.*

Yes, older	Yes, younger	No

10) Do you know how to read? And his/her other parent?

Father or guardian		Mother or guardian	
Yes	No	Yes	No

11) What is the highest level of education you reached? And his/her other parent?

Father or guardian	Mother or guardian
No schooling	No schooling
Literacy	Literacy
Elementary	Elementary
Middle school	Middle school
High school	High school
Higher education	Higher education

12) What is your profession? And his/her other parent?

Father or guardian	Mother or guardian
Farmer	Farmer
Seller	Seller
Trader, Artisan	Trader, Artisan
Driver	Driver
Executive	Executive
Employee, laborer	Employee, laborer
Retired	Retired
Unemployed	Unemployed
Abroad	Abroad
Other	Other

13) What is your native language? And his/her other parent?

Father or guardian				Mother or guardian			
Wolof	Pulaar	Seereer	Other	Wolof	Pulaar	Seereer	Other

14) What language(s) do you speak at home? *Several possible responses*

Father or guardian					Mother or guardian				
Wolof	Pulaar	Seereer	French	Other	Wolof	Pulaar	Seereer	French	Other

15) If French:

	Father or guardian			Mother or guardian		
Do you understand French?	Yes	A little	No	Yes	A little	No
Do you speak French?	Yes	A little	No	Yes	A little	No
Do you know how to read in French?	Yes	A little	No	Yes	A little	No

16) How often do you speak French to your child? And his/her other parent?

Father or guardian	Mother or guardian
Never	Never
Several times per month	Several times per month
Several times per week	Several times per week
Almost every day	Almost every day

6.3. TEACHER QUESTIONNAIRE

In each school, two teachers must be interviewed:

. The teacher who took the 2017-2018 CI class
. The teacher who took the 2017-2018 CP class

1. Elementary school identification

School name:	Code:

IA	IEF	Commune

2. Teacher identification and characteristics

Level taught in 2017- 2018	CI	CP

Gender	Male	Female

Native language	Pulaar	Seereer	Wolof	Other: .....

Status	Official	Contractual	Voluntary

Highest academic level attained								
<3rd	3rd	2nd	1st	Finished	Bac + 1	Bac +2	Bac +3	Bac + 4 or +

Highest diploma achieved	BFEM/DFEM	Baccalaureate	Under-graduate degree	Masters	Other	None

Professional diploma	None	CEAP	CAP	Other

First year of career	

Number of days of continuous training in recent years (all types and forms together)							
2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-2017	2017-18

3. Perceptions of comfort in French

How comfortable do you think it is for you to read in French?				
Not at all comfortable	A little comfortable	Average level of comfort	Quite comfortable	Very comfortable

How comfortable do you think it is for you to write in French?				
Not at all comfortable	A little comfortable	Average level of comfort	Quite comfortable	Very comfortable

How comfortable do you think it is for you to speak in French?				
Not at all comfortable	A little comfortable	Average level of comfort	Quite comfortable	Very comfortable

How comfortable do you think it is for you to understand French?				
Not at all comfortable	A little comfortable	Average level of comfort	Quite comfortable	Very comfortable

How comfortable do you think it is for you to teach in French?				
Not at all comfortable	A little comfortable	Average level of comfort	Quite comfortable	Very comfortable

4. Questions about the class s/he taught in 2017-2018

4.1. Characteristics of the class

Number of students in the class	

Was your class part of specific program?	Yes	No

If yes, which program?					
LPT	ELAN	ARED / Emil	IFADEM	ADLAS	Other: .....

	Textbooks available				If yes, were they used?
	Yes, 1 per student	Yes, but 1 book per 2 students	Yes, but 1 book for 3 or more students	No	
Reading textbook in French					
Exercise workbook					

On what date did teaching-learning actually begin in 2017-18?	.. / .. / ….

On what date did teaching-learning end in 2017-18?	.. / .. / ….

During the course of the 2017-2018 year and excluding school vacations, were teaching-learning activities ever interrupted?

Never	< 15 days	15 days to 1 month	1 to 2 months	> 2 months

4.2. Linguistic situation in the 2017-2018 class

Except for French, did you speak another language while teaching, in class?	Yes	No

If yes, which language(s) did you speak? *Several possible answers.*			
Pulaar	Seereer	Wolof	Other: .....

If yes, and several languages are cited: please state the language you used most.			
Pulaar	Seereer	Wolof	Other: .....

Outside of class, did you speak another language than French with your students (to announce recess, correct student behavior, etc.)?	Yes	No

If yes, which language(s) did you speak? *Several possible answers.*			
Pulaar	Seereer	Wolof	Other: .....

Taking all time spent with the students into consideration (in class, during recess, etc.) would you say that your interactions with your students in French were:				
Very infrequent: 20% of the time or less	Quite infrequent: 20 to 40%	About average in frequency: 40 - 60%	Quite frequent: 60 to 80%	Very frequent: 80 to 100%

Taking into consideration all of the time you spent with your students, would you say that the interactions in a language other than French were:				
Very infrequent: 20% of the time or less	Quite infrequent: 20 to 40%	About average in frequency: 40 - 60%	Quite frequent: 60 to 80%	Very frequent: 80 to 100%

4.3. Time allotted to different teaching activities in the 2017-2018 class

In a typical week, how many minutes did you dedicate to the teaching of oral language (in French)?	

In a typical week, how many minutes did you dedicate to work around a text and discussion in French (reading and discussions around a story, recitation, etc.)?	

In a typical week, how many minutes did you dedicate to the teaching of sentences and grammar (in French)?	

In a typical week, how many minutes did you dedicate to the teaching of oral vocabulary (in French)?	

In a typical week, how many minutes did you dedicate to the learning of reading and writing (in French)?	

More specifically for reading, in a typical week, how many minutes did you dedicate to:	
Teaching coding	
Working on comprehension	

More specifically for writing, in a typical week, how many minutes did you dedicate to:	
Teaching coding	
Graphic work	

4.4. Teaching activities (in French) in the 2017=2018 class

How often do you read stories aloud to the children?			
Never	Once a month	At least once per week	Every day

How often do you ask the children what they understood of the story you read to them (who were the characters, what did they do, when, why, what was the result)?			
Never	Once a month	At least once per week	Every day

How often do you ask one of the children in the class to retell an event from his life?			
Never	Once a month	At least once per week	Every day

How often do you ask other children to ask questions about this event?			
Never	Once a month	At least once per week	Every day

How often do you ask the children to give their opinion on a given subject (food, the city, the county...)?			
Never	Once a month	At least once per week	Every day

How often do you ask the children to recite texts (story, poetry...) from memory?			
Never	Once a month	At least once per week	Every day

How often do you ask the children to put words in order (for example, "Daddy Apple Eats" => "Daddy eats an apple") and to add the missing word?			
Never	Once a month	At least once per week	Every day

How often do you work with the children on the different types of sentences (declarative, interrogative, negative, imperative)?			
Never	Once a month	At least once per week	Every day

How often do you work with the children on the conjugation of verbs in the present tense?			
Never	Once a month	At least once per week	Every day

How often do you work with the children on ways to indicate the past?			
Never	Once a month	At least once per week	Every day

How often do you work with the children on ways to indicate the future?			
Never	Once a month	At least once per week	Every day

How often do you work with the children on the most frequent irregular French verbs (to be, to have, to do, to say, to go) in the present?			
Never	Once a month	At least once per week	Every day

How often do you work with the children on the most frequent irregular French verbs (to be, to have, to do, to say, to go) in the future?			
Never	Once a month	At least once per week	Every day

How often do you work with the children on the most frequent irregular French verbs (to be, to have, to do, to say, to go) in the compound past?			
Never	Once a month	At least once per week	Every day

How often do you work with the children on the classification of words by category (animals, vegetables, fruits, trees, etc.)?			
Never	Once a month	At least once per week	Every day

How often do you work with the children on learning the names of the letters of the alphabet?			
Never	Once a month	At least once per week	Every day

How often do you work with the children on learning the sounds of the letters of the alphabet?			
Never	Once a month	At least once per week	Every day

How often do you work with the children on learning the how to write the letters of the alphabet?			
Never	Once a month	At least once per week	Every day

How often do you work with the children on the basic sounds of oral language (phonemes)?			
Never	Once a month	At least once per week	Every day

How often do you work with the children on the most consistent grapheme-phoneme relationships?			
Never	Once a month	At least once per week	Every day

How often do you work with the children on the context-dependent grapheme-phoneme relationships?			
Never	Once a month	At least once per week	Every day

How often do you work with the children on the grapheme-phoneme relationships for morphological marks (differences between written and oral)?			
Never	Once a month	At least once per week	Every day