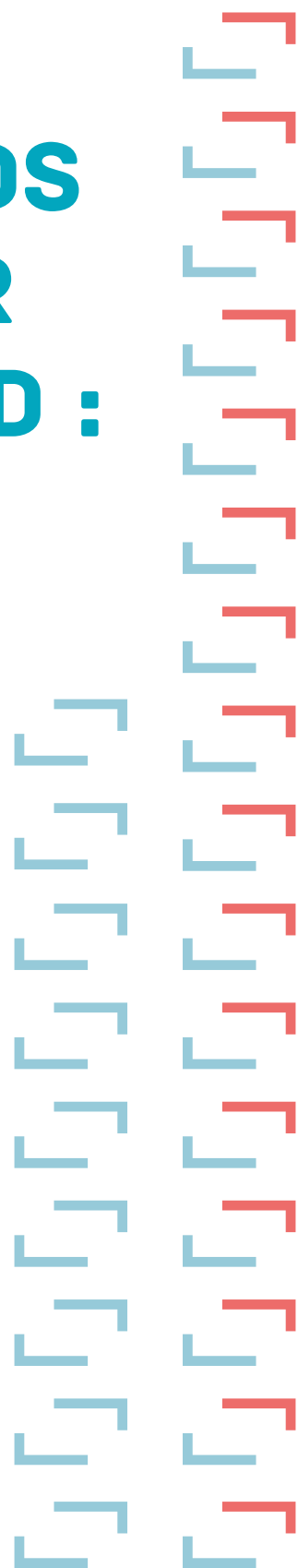


TEACHING METHODS AND MANUALS FOR LEARNING TO READ : HOW TO CHOOSE ?



Analysis conducted in 2018-2019
by the Working Group Teaching methods and Manuals
of the **French Scientific Council of National Education**
in concertation with the Académie de Paris

Teaching methods and manuals for learning to read: How to choose?

**Analysis conducted in 2018-2019
by the Working Group "teaching methods and manuals"
of the French Scientific Council of National Education (CSEN)
in concertation with the Académie de Paris**

Collective text written under the direction of Stanislas Dehaene by the Working Group "Teaching methods and manuals" of the French Scientific Council of National Education coordinated by Maryse Bianco and Michel Fayol and also composed of Gérard Berry and Etienne Ghys. Participants: Jérôme Deauvieu, Ghislaine Dehaene-Lambertz, Caroline Huron, Patrice Lemoine, Franck Ramus, Liliane Sprenger-Charolles, and Johannes Ziegler.

Summary

Teaching methods for learning to read are the subject of much debate, and French publishers offer more than thirty-five manuals and reading methods. Which one to choose? We address this issue by relying on the bulk of scientific knowledge now available on learning to read. In the first part, we briefly summarise current knowledge on the mechanisms of reading and learning. We also analyse the place of manuals in the broader context of teaching methods for learning to read. In a second step, we look at the use of manuals, their impact, and their future in a digital world. On this dual basis, we set out a series of principles that, according to current knowledge, should guide the design and evaluation of reading manuals. We also present a list of pitfalls to avoid. The last part, finally, presents the "reading plan" recently deployed by the Académie de Paris and which has made the choice of a limited number of manuals, in the context of a global action of training and accompaniment of all those concerned.

Table of contents

I. A brief summary of the science of reading	4
1. A starting point: spoken language	4
2. Spoken language and written language: a fundamental distinction	5
3. The doorway to reading	5
4. Grapheme-phoneme and orthographic transparency	7
5. Two learning phases, two reading channels	7
6. Serial decoding with effort (phonological channel)	7
7. Direct parallel reading (lexicon or orthographical channel)	7
8. Comprehension	7
9. Vocabulary	8
10. Morphology and syntax	8
11. Entering into the sense of a text	8
12. The reading triangle	9
13. Determining factors in effective reading	9
14. A simple formula: written comprehension = decoding x oral comprehension	10
15. Decoding and understanding: very different time scales	11
II. The manual and reading methods, today and tomorrow	12
1. What is known about the use of manuals in France?	12
2. What do we know about the current impact of manuals on learning to read?	12
3. How can we regard the reading manual of today and tomorrow?	14
III. Proposal for an analysis grid for reading manuals in preparatory class	16
1. Ergonomics	16
2. Criteria for teaching decoding and encoding	17
3. Criteria for the teaching and understanding of the French language	20
4. Pitfalls to be avoided	21
5. Outstanding issues	24
6. Other generic recommendations	25
IV. The example of the "reading plan" deployed in 2017-2018 in the Académie de Paris	27
1. An extensive didactic and pedagogical organisation	27
2. A systemic design of the scheme	27
3. Training: didactic expertise, presence in classrooms, and benevolence towards teachers	29
4. The introduction of the Handbook as the result of elements apprehended in training	29
5. Final commentary of the French Scientific Council for national education	31
V. Bibliography	32

I. A brief summary of the science of reading

A recent article, written by three major actors in the cognitive sciences of reading, announces the end of the "reading wars" (Castles, Rastle, & Nation, 2018). Indeed, research on learning to read is remarkably convergent, both in the laboratory and in class experiments. Here we summarise the essential points.¹

1. A starting point: spoken language

The child is first confronted with spoken language. From the first months of life, they appropriate their mother tongue. Written language happens much later. The learning of reading is therefore based largely on the language knowledge already acquired by the child, which they recycle and refine.

What we refer to as "spoken language" actually corresponds to multiple levels of organisation:

- **Prosody** corresponds to the overall melody of words and phrases.
- **Phonology** describes the composition of speech in *syllables* themselves formed of *phonemes*, of which each language organises the succession according to precise rules (for example, no word of French starts with "TL", but this combination is possible in the middle of Word as in "Atlantic").
- The **lexicon** contains the words of the mother tongue (for example, Crapaud (toad) and Drapeau (flag) are words but 'grapeau' is not). Our brain contains several orthographic (the spelling of known words) and phonological (pronunciation of known words) lexicons, both in perception and production.
- **Morphology** is the knowledge of *morphemes*, i.e. the elements of meaning (root of words, prefixes, suffixes, grammatical terminations) and their combinations. A word like "recommencera" (to start again) consists of three morphemes: "re", "commence" (start), and the ending "era" for the future.
- **Syntax** is the knowledge of grammar rules that can be used to put words or morphemes in order. It is syntax that allows us to see that "the big yellow dream is watching" is a grammatically correct sentence, even if it makes no sense.
- **Semantics** correspond to the representation of the meaning of words, phrases and texts. One can know the word "anachorète" (lexicon) without really knowing the meaning (semantics).
- **Pragmatics** is the knowledge of the meanings in context and the conditions of use of language in communication.

These levels exist in all human languages, but they employ different rules to form words and phrases. Thus, children must learn the specificities of their mother tongue. This learning begins at birth. A newborn perceives the difference between sentences in French and Russian because the melody and rhythm of these two languages are very different.

¹ We did not wish to saturate this text with an excessive number of scientific references, but the following reference texts can be consulted: castles *et al.* (2018); Deauvieu *et al.* (2015); Dehaene (2007, 2011); Dehaene *et al.* (2015); Ehri *et al.* (2001); Goigoux (2016a); Kolinsky *et al.* (2018); Morais *et al.* (1998); National Institute of child health and human development (2000); Sprenger-Charolles *et al.* (2018) or the video *read and write in CP* (lecture by Franck Ramus at esenesr): <https://www.YouTube.com/watch?v=-SfPHLhq9qY> ; and other lectures available on the csen website.

The acquisition of the melody of language, the phonemes it implements and their rules of combination occurs in the first year of life, long before babies produce their first words. The acquisition of vocabulary (lexicon, morphemes) also begins in the first year and extends throughout life. As of one year, the child recognises many spoken words (long before they know how to produce them) and understands their meaning – a vocabulary-learning process that accelerates at the end of the second year of life to 10 to 20 words a day.

Along with a corresponding development of knowledge of grammar (also called syntax): some constructions are present in the child of 18 months, but others, such as passive and relative, are mastered only after 5/6 years of age. Even at the end of the primary school, complex constructions are not fully acquired.

The intensity of children's exposure to spoken language and the quality of this language play an essential role in the development of all these levels. It is now known that there are great differences of exposure to spoken language in family types and social classes, and that these differences correlate with the extent of the lexicon and the development of the brain's language systems. This is why parents have to be encouraged to talk to their children early on, as well as to read stories to them. Peer learning is not enough, and the discussion with an adult, who is attentive to the maintenance of the child's attention, is much more effective. The development of spoken language prepares the entry into the reading.

2. Spoken language and written language: a fundamental distinction

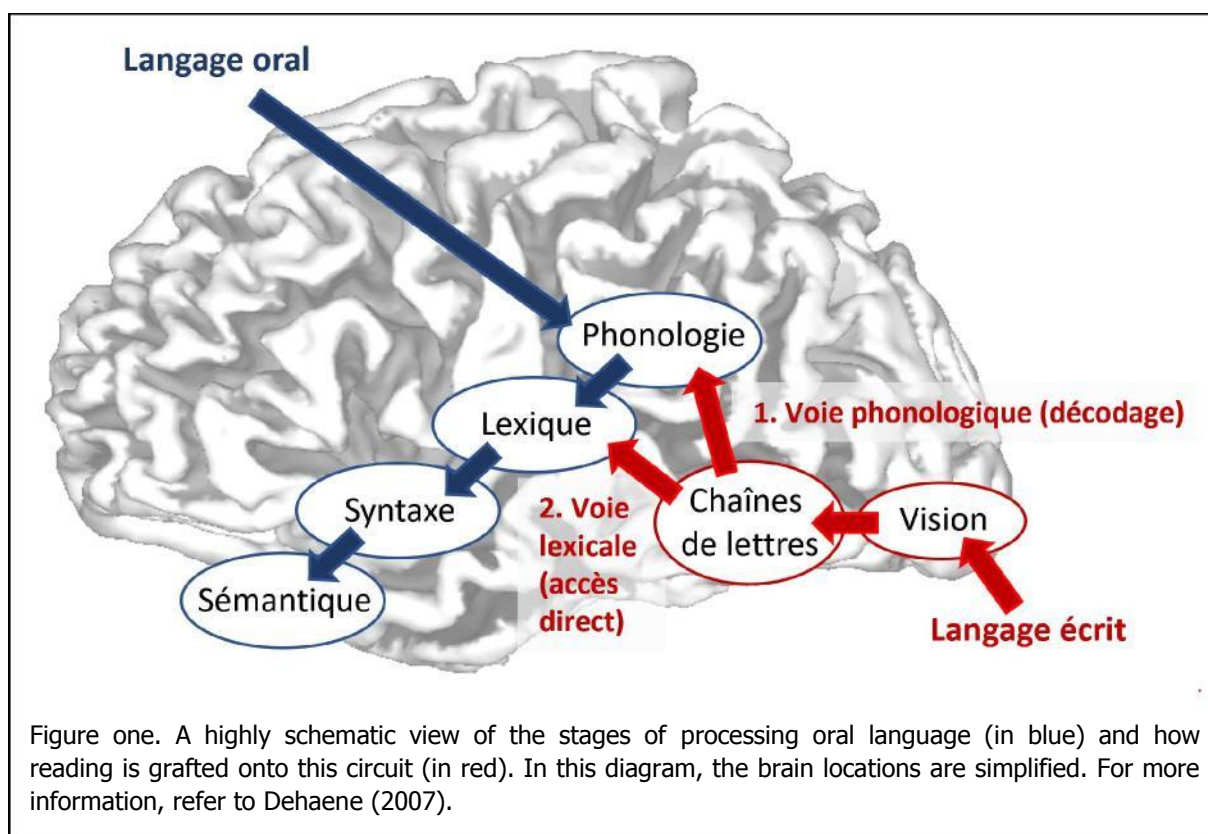
In terms of learning, spoken language and written language are fundamentally different.

- Spoken language is likely the result of the biological evolution of the human brain. Learning occurs naturally as soon as a child is immersed in a linguistic environment. Most specialists consider it probable that Darwinian evolution has dedicated brain mechanisms peculiar to the human species to this learning.
- Writing is a recent and optional invention, which varies greatly from one culture to another. Learning to read is to substitute the word for a new visual input. This invention is remarkable because it exploits the possibilities of the human brain, but it must be taught explicitly. It is wrong to think that simple exposure to writing is enough to discover its principles. Depending on the complexity of the writing system, and depending on the effectiveness of the teaching strategy, the written code can be acquired in just a few months and is then grafted onto spoken language.

Spoken language and written language are therefore two different ways of arriving at the same meaning (Figure 1). Oral entry (Prosody and speech phonology) and Visual input (the alphabet) use different codes and brain regions to enter the same linguistic system.

3. The doorway to reading

Learning to read is to develop a new way of entering into the circuits of language, through vision. With learning, one sees in the brain of literate people a visual region that specialises in the effective recognition of letters and chains of letters. This region identifies the letters, regardless of size and font, and sends this information to the spoken language areas. From there, reading or hearing sentences activate almost exactly the same knowledge. This is why one can go through the oral input to develop the comprehension of sentences and texts, before reading per se is in place.



Key: Langage oral – Oral language
 Phonologie - Phonology
 Lexique - Lexicon
 Syntaxe - Syntax
 Sémantique - Semantics
 Voie phonologique (décodage) – Phonological channel (decoding)
 Chaînes de lettres – Letter strings
 Voie lexicale (accès direct) – Lexicon channel (direct access)
 Langage écrit – Written language

4. Grapheme-phoneme correspondence and orthographic transparency

In French, as in all alphabetic writing, the letters correspond to sounds (with irregularities). More specifically, it is said that *graphemes*, i.e. letters or groups of letters such as "ch", correspond to *phonemes*, the minimum units of spoken language as/ch/². Sometimes a grapheme matches several phonemes (the x of "taxi" corresponds to the phonemes/k/and/s/). It also happens that a grapheme is ambiguous: "ch" can pronounce/ch/in "child" but/k/in "choir".

Depending on their history, languages vary greatly in the simplicity of their sound notation, which is also called the transparency of grapheme-phoneme correspondence. This transparency has a direct impact on reading learning speed (Seymour et al., 2003; Ziegler, 2018) and even, it seems, on the

² For greater clarity, we did not use the phonetic alphabet, but simply indicated the phonemes by bars (e.g./ch/as in "chat" (/sh/ sound in English)). We also think that it is not necessary to introduce the phonetic alphabet, either in manuals or in teacher training.

size of the cortex region dedicated to the visual recognition of words (Paulesu *et al.*, 2000). The French language includes several irregularities (though much less than English), but still requires a prolonged learning effort.

5. Two learning phases, two reading channels

Schematically, one can distinguish two learning phases, which correspond to two reading channels (Figure 1).

6. Serial decoding with effort (phonological channel)

In the first step, the child deciphers, practically one by one, each of the graphemes of the written word, and transforms them into the sounds of the language. They can then "mentally listen" to the words produced and, if they recognise them orally, understand them. This is the decoding method or ***phonological reading***: we listen to what we read before we understand it. Grapheme-phoneme decoding replaces the auditory input of speech with a written input.

7. Direct parallel reading (lexicon or orthographical channel)

In a second step, as reading becomes automatic, the visual system becomes able to process the word written as a whole: the letters are identified in parallel rather than serially. This is the *direct reading* path, where the written word directly accesses the mental lexicon, where the orthographic and sound forms of words and their meaning are linked. The automation of the lexicon reading channel is essential, because it is the only way that the child can read quickly, effortlessly, and release the child's attention, who can then focus on understanding the text. Indeed, one cannot pay attention to two things at the same time: until the child has automated this step of transcoding, comprehension of the text is penalised.

Any teacher, or parent, can evaluate what stage of automation has been reached: just present the child with a list of words, and time how many words are read correctly aloud in a minute. A good College (secondary school) start reader reads aloud from 150 to 200 words per minute. At the end of preparatory class, the average speed is thirty-five words per minute (a little more than a word every two seconds). It is quite possible for a child in preparatory class to read about fifty words per minute (each word taking a little more than a second) – this is the case of the most advanced children today, and this target of fifty words/minute is the recommendation of the direction general of school education (Dgesco).

Researchers also evaluate how the reading time of a word varies according to its number of letters: for the beginner reader, each additional letter adds a significant delay (in the order of a fifth of a second), while with automation, all words from 3 to 8 letters are read at the same speed.

Despite this automation, both channels continue to operate in parallel with all readers. The auditory representation of Word phonology continues to unconsciously activate in the adult expert reader, and this indirect pathway remains essential to read new words or invented words. When an adult expert reads a word invented such as "mintarque", or a word they encounter for the first time, such as "Zakouski", their reading time indicates that they are returning to a slow and sequential decoding of the graphemes composing it.

8. Comprehension

Reading is just a new way of entry into language, which was once only accessed by speech. The comprehension and mastery of the language can be worked orally initially and then jointly orally and in writing as soon as the decoding is sufficient.

9. Vocabulary

Vocabulary is learned from rich environments. The presentation of a new word in many contexts, both in reception and in production, makes it possible to refine its meaning, well before reading the definition in a dictionary. Since kindergarten and certainly in preparatory class, lessons (or sessions) are devoted to specific work on words, their morphology, their possible polysemy and their multiple classification criteria. These sessions give rise to interactions that allow pupils to use the learned words on their own, in oral and written output when they are sufficiently advanced. The gradual use of writing enables a link between the sound and orthographic forms of the words. This enrichment of the linguistic environment is crucial for children with poor lexical baggage.

10. Morphology and Syntax

Reading allows a better awareness of the structure of the language, especially in French where morphological markers are much less present in oral than in writing. For example, "il parle" (he speaks) and "ils parlent" (they speak) are perceived in an identical way in the oral sense, as well as "ami", "amie", "amis" and "amies" (all friend/friends in the masculine and feminine forms that sound identical). Morphological markers complicate the spelling of French, but they facilitate reading comprehension, as they provide many hints of syntax and meaning. This is why it is important to work with morphology, in conjunction with oral and written language.

Two types of morphology have been defined (Casalis & Colé, 2018):

- derivational or lexical morphology enables the creation of words by associating a known Word (a base) with one or more prefixes and suffixes, for example, from "grand" (large) one can manufacture "grandir" (grow), "grandeur" (extent), etc.). Children learn very early and implicitly how to use this property of the language. This knowledge can be exploited orally to enrich the lexical baggage by working on the families of words³.
- flexional or grammatical morphology concerns the phenomena of agreement in genre and number of nouns, verbs and adjectives (grand, grande, grandes, etc. (large singular, feminine, plural)) as well as the fashion, time and person of verbs (grandir/il grandissait/il grandira (to grow, he would grow, he will grow) Je mange, tu manges (I eat, you eat), etc.).

In writing, many silent letters correspond to bending or derivation marks. Understanding the structure of the language allows them to be recognised, to automate their reading and, later, to spell them correctly.

11. Entering into the sense of a text

All this linguistic knowledge, teamed with semantic knowledge related to the themes and the structure of the texts, will then allow the child to understand written texts.

³ Casalis et al. (2018)

In a somewhat complex text, the difficulty is often to establish the relationship between the ideas expressed in successive sentences. These relationships are often carried by certain words, including pronouns (such as "his", "he"...) and temporal connectors ("then", "tomorrow"...) or logical ones ("but", "so"...). But when they are implied, their understanding must involve mechanisms of inference and reasoning, which are based both on automatisations (activation/inhibition of knowledge in memory) and on the implementation of strategies of understanding. This latter activity, deliberate and thoughtful, is all the more required when the texts to be understood deal with little known themes for the reader, who must then engage in a rigorous analysis of each of the sentences and the relationships that support them. Comprehension strategies are learned early (from 3 years, therefore on the basis of oral language) but they continue to develop gradually and continuously throughout the course of schooling. Their acquisition involves long-term learning that is sometimes difficult and often requires explicit instruction.

12. The reading triangle

In summary, the learning of reading corresponds to the setting up of a triangle (see Figure 1).

- To decode new words, you must know how to pass letters to sounds and recognise the corresponding spoken word (phonological channel or decoding).
- To read efficiently, you must know how to move quickly from a string of letters to the corresponding word or morpheme (lexicon or orthographic channel).

The first path must be explicitly taught. The sooner one teaches, explicitly and systematically, each of the grapheme-phoneme correspondences, the sooner the child will know how to decode the written words. The second path, on the other hand, is set up naturally and strengthens as the child reads. We talk about *self-learning* : If the child knows how to decode a word like "lapin", even if slowly, it gives them the means, in all autonomy, to gradually learn how to quickly link this chain of letters with the entry of the word "rabbit" in their mental lexicon of spoken language. Little by little, simply by reading a lot and using the context, the child who knows how to decode will be able to automate their reading alone.⁴

13. Determining factors in effective reading

The model in Figure 1 makes it possible to understand all the components that determine whether a child will succeed in learning to read fluently. Each of the components contained therein is necessary for reading, and each of them can be a source of difficulty. Let's review them:

- **Good vision.** This is the way of entry of written words. It is essential that the child's visual system can clearly distinguish the letters, without transposing them and without confusing the mirrored letters as p and q. Even before the preparatory class, recognising and tracing the letters with the finger are useful educational activities. It is also important that the child moves his or her gaze efficiently towards each of the letters or each of the words to be read in the direction of reading (left-right).

⁴ **this** self-learning is only possible in alphabetic or syllabic writings, but not in the so-called logographic or morpho-syllabic languages such as Chinese. Chinese children must explicitly learn, at a rate of about 500 characters per year, several thousand often arbitrary correspondences between the written characters and the corresponding words or morphemes of the spoken language. ⁵ attention: the letters correspond to their sound and not to their name in the alphabet. The recitation of the alphabet does not play an essential role in the pedagogy of reading. However, the letters and their names are learned from kindergarten. Their knowledge is a good predictor of learning to read, and knowledge of the names of letters facilitates that of their sounds. See for example Foulin (2005 and 2007).

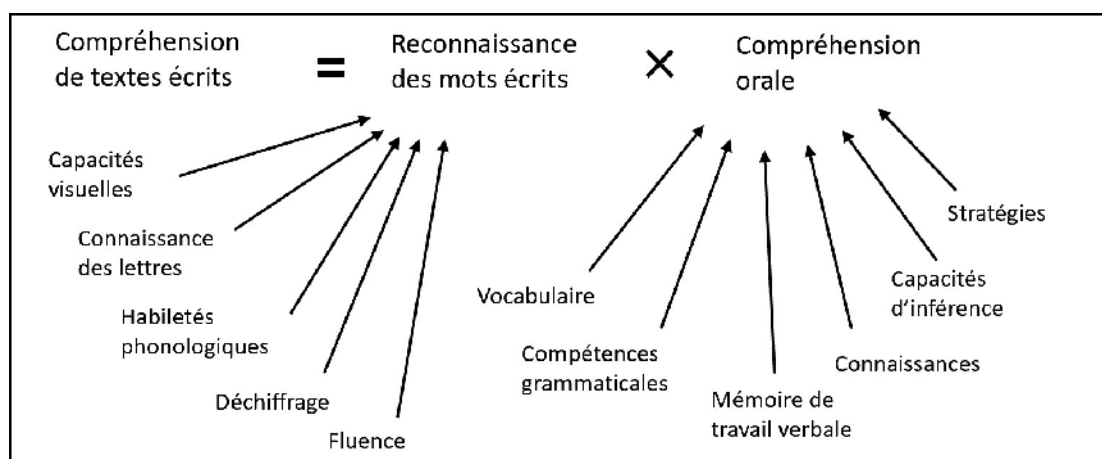
- **Good phonology.** This is the target of decoding: the child must distinguish between phonemes and their temporal order. Even before reading, language games (rhymes, etc.) gradually enable the child to develop an increasingly precise and explicit conscious representation of the phonemes that compose the syllables of their language.
- **Explicit teaching of the alphabetical principle and the grapheme-phoneme correspondence.** It is the very core of decoding – to understand that one can pass from the space of the written word, from the left to the right in French, to the temporal sequence of the phonemes of the word spoken, and to know all the conventions.⁵
- **Extended vocabulary.** It is not enough for the child to know how to hear a written word in his head –the word they have decoded needs to enter into their oral lexicon. Thus, the enrichment of oral vocabulary is an essential preparation for reading.
- **Knowledge of oral and written morphology.** The efficiency and rapidity of the direct path of access to the lexicon are decisive for smooth and effortless reading. If "writing is the painting of the voice" (Voltaire), it also includes conventions of writing morphemes, for example the differences between "parle" and "parlent" (speak by one or by many, or between "ami" and "amis" (single friend or plural friends), which cannot be heard but indicate that the written word is singular or in the plural. Knowledge of morphemes is essential for the construction of the orthographic path and must be taught explicitly. Teaching begins from the preparatory class and must be pursued in subsequent years.
- **Syntactic and semantic skills.** Once the written word is recognised and found in the mental lexicon, the child will deploy, for written comprehension, the same linguistic resources as for oral language. Again, the more oral language proficiency is developed, the better the written comprehension will be. Some difficulties in reading are due to difficulties in the treatment of oral language, which can be of social origin (low socio-economic level, other mother tongue) or pathological (dysphasia).

Beyond disorders such as dyslexia or dysphasia, which concern a limited number of pupils, children who enter the preparatory class, even French speakers, have very unequal control over the syntax, vocabulary in oral comprehension of texts. Fluidity in the various speech registers, the ability to manipulate the sounds of speech or the families of words, maintained by nursery rhymes, word games, tales, outings to museums, libraries, or to the cinema intervene in the child's ease with the word and with writing. Children who have not benefited from this cultural environment will already be in a gap. Empirically, the number of books at home or the mother's diploma (testifying to the valorisation of writing in the family) are cultural factors that intervene in the success of learning to read.

14. A simple formula: Written comprehension = decoding x oral comprehension

The relationship between reading and understanding is often misunderstood. It goes without saying that the purpose of reading is to understand what is written. However, to achieve this, it is necessary to know how to effectively decode this cryptogram that is writing. This is why a focus on decoding at the beginning of schooling also improves comprehension of writing. Decoding is therefore not the opposite of understanding, and there is no reason to oppose these two activities. On the contrary, they are complementary, and it is necessary to develop decoding and the oral comprehension in parallel (whilst decoding is not sufficient to enable written comprehension). Early intervention aimed at reinforcing the mastery of oral language also promotes reading comprehension at the outset of learning (Bianco *et al.*, 2012).

A simple formula summarises the interaction between decoding and understanding. It is a multiplicative relationship: the comprehension of writing is the product of the recognition of written words, and of the oral comprehension of the same words, phrases and texts that compose.



Thus, and to simplify, failure in comprehension can result from two sources:

- Poor decoding of written words
- A misunderstanding of oral language

This formula shows that both skills are indispensable for effective reading.

15. Decoding and understanding: very different time scales

Decoding and understanding have very different learning dynamics.

- Learning to understand spoken language begins in the first year of life, and continues in kindergarten, in preparatory class, and throughout life. At school, the phonology, oral vocabulary, syntax and semantics of the French language are worked out from kindergarten.
- The learning of the decoding of writing is a very special time: it is the learning of the actual reading, the subject of cycle two and more particularly of the preparatory class. Experience shows that it is possible to quickly learn many grapheme-phoneme correspondences, and that the more this learning is concentrated in the first quarter of preparatory class, the more effective the entry into reading (Goigoux, 2016a; Riou & Fontanieu, 2016).

In brief, understanding is the ultimate goal of reading, while decoding is only the instrument--but an indispensable instrument. Each child must quickly "learn their scales" and thus master their instrument (the grapheme-phoneme correspondences) to interpret the musical score that is the text.

Thus, the complementary teaching of the meaning and the code, must be strictly applied to the preparatory class. During the first half of the school year, a strong emphasis must be placed on decoding and encoding, while throughout the year (and in reality, since kindergarten), time must be dedicated to the French language, vocabulary, understanding and, later, to the specific difficulties that can be posed by written comprehension.

II. The manual and reading methods, today and tomorrow

The "manuals and pedagogy" Working Group of the CSEN conducted a synthesis to take stock of the research already conducted on the characteristics of manuals and their actual use by teachers and pupils in primary school. It relied on surveys carried out (e.g. by ONL or CNESCO) and on reports written (by the General Inspectorate in particular), some (rare) international publications were also consulted.

1. What is known about the use of manuals in France?

Today there is an extraordinary plurality of manuals in France: more than thirty-five manuals and reading methods are marketed. They vary considerably in shape and design.

Available documents (Leroy, 2012; ONL, 2007) as well as the consultation of researchers who have studied manuals and their use agree to emphasise that manuals available in schools are often relatively old (sometimes up to 2001) and stagnated compared to current programmes. In fact, the municipalities only partially renew them, probably because of their cost. As a result, teachers do not always choose their manual. They rarely have adequate financial resources.

In the same school, manuals change from one class to another, sometimes by being designed by different authors, which harms conceptual and formal consistency during schooling, for example during the transition from preparatory class to CE1 (second year primary). The accompanying documents (teacher's books, cards, etc.) are not often consulted and followed. As a result, teachers are increasingly adapting the activities and exercises from manuals to the point where the theoretical foundations or initial intentions of their authors are somewhat lost.

Students themselves often work on cards. As for parents, most manuals do not take their participation into account, for example to follow the course of learning or to consolidate them. Overall, therefore, we are dealing with expensive documents, often outdated, poorly consulted and whose suitability for missions that might correspond to them is low.

Specifically, with respect to manuals dedicated to learning to read, the research report "reading and writing at preparatory class" refers to a wide variety of manuals for learning to read, and reports that 30% of teachers not use any particular manual (Goigoux, 2016a). Another study (Deauvieu *et al.* 2015) also stresses that teacher choices are varied and do not necessarily focus on the principles set out in this document.

In the light of the observations and data available, manuals, irrespective of the discipline or field of focus, remain just another of the components of teaching and learning. Teacher training is inadequate as to their interest, their existence, their choice, and their use. While recalling that it is not the manual that teaches, but the teacher, one may fear that a poorly designed manual can induce, especially among novice teachers, inadequate practices.

2. What do we know about the current impact of manuals on learning to read?

International data on teaching strategies for reading in alphabetic writings have been converging for many years (castles *et al.*, 2018; Ehri *et al.*,

2001 Morais *et al.*, 1998; Sprenger-Charolles *et al.*, 2018). In accordance with the above scientific analysis, this data indicates that the rapid and systematic learning of grapheme-phoneme correspondence, by a method known as "phonic", guarantees the best results, both in oral reading comprehension, even in English, where these correspondences are less transparent than in French, (Landerl, 2000). Research shows that grapheme-phoneme correspondences gain from being taught quickly (Goigoux, 2016a; Riou & Fontanieu, 2016) and in a rational order, based on their frequency and regularity in the language (Graaff *et al.*, 2009).

Among the phonic methods, a slight advantage is observed in favour of synthetic methods (where the child learns to assemble the graphemes to form syllables and words) compared to the analytical methods (where the child learns to break down the words in letters), but the experimental data on this point do not allow firm recommendations (castles *et al.*, 2018), and both activities are interrelated and indispensable.

The insistence on grapheme-phoneme correspondence does not in any way mean that the other components of reading should be neglected. Thus, research shows that even before preparatory class, phonology and oral comprehension can be the subject of specific training, with distinct and complementary effects on reading one year later (Bianco *et al.*, 2012).

If research on teaching methods tends to converge, the distinct question of the impact of manuals themselves on educational activities has been largely neglected. Does the use of certain manuals ensure better success in learning? We do not have evidence today that would enable a firm scientific response. In France, only two studies, both correlational and with limited populations (Goigoux, 2016b; Deauvieu, 2013), however, provide important observations that converge with available data on the most effective techniques or practices to help pupils in this learning.

The "read and write in preparatory class" report (Goigoux, 2016b) examines the teaching of reading in 131 classes. With experienced teachers it failed to detect a significant effect of the reading manual used⁶. By comparing the manuals used in the fifteen best performing classes and the fifteen lower performing classes, the report notes a similar distribution of manuals. Teachers using different manuals achieve similar results, and teachers using the same manuals get varying results. The most important dimension is therefore not the manual but the teaching that accompanies it, and the expertise of the one who dispenses it. In accordance with the literature, the elements that promote learning are the tempo of the introduction of grapheme-phoneme correspondence at the beginning of the year (from 12 to 14 matches studied during the first 6 weeks), the use of sufficiently decodable texts (thus defined as comprising 60% or more of correspondence already taught), the practice of reading aloud, and encoding activities (i.e. written production) parallel to decoding activities.

The second study available (Deauvieu, 2013) focused on the comparative efficacy of two types of reading manual. This concentrated on preparatory classes for children from less privileged families.

⁶ The detailed report (Goigoux, 2016b), however, reports on page 371: "we have however identified a positive effect, but only in understanding, for classes that use a code-centric manual by comparison with classes that use an integrative approach ($p = 0.019$). This effect relates to the population of pupils as a whole and, more specifically, to pupils of intermediate initial level in comprehension ($p = 0.010$).

and using either a mixed approach⁷ (6 classes for each of two manuals studied) or a syllabic approach (5 and 6 classes using one of the two manuals responding to this approach). Students' performance at the end of the school year in text reading fluency and comprehension are better for one of the syllabic manuals, the less good for a mixed manual, and intermediate for the last two manuals (a mixed and a syllabic). These results suggest that the syllabic approach is more effective. Some criticism may nevertheless be levelled at this work, which it would be useful to extend. Firstly, it was not verified to what extent the teachers followed the recommendations of the manuals in order to teach. Secondly, the initial level of pupils at the beginning of the preparatory course was not assessed – although all belonged to a priority education network, to homogeneous social recruitment, and that the socio-professional category of parents was checked by regression in the analyses. Finally, correlation is not causality, and a teacher effect can also intervene in these results.

To sum up, the available data does little to conclude the effectiveness of a particular manual to help teachers teach reading and writing to their pupils. Insofar as we can ascertain, this impact could depend above all on the user, in other words the expertise of the teacher.

3. How can we regard the reading manual of today and tomorrow?

While the specific role of the manual is difficult to separate from the teacher effect, the scientific evidence undoubtedly suggests that some teaching strategies for reading are gaining more systematic adoption, as indeed is the case with experienced teachers. It must therefore be possible to develop specific criteria for the design and selection of manuals, as well as to train teachers in their use, in particular to better guide novice teachers.

Contributors and members of the CSEN agree on the following general points:

- **A manual is useful**, especially among less experienced teachers, to enable the gradual and rational organisation of acquisition and deepening of reading throughout primary education and providing a link between families and school.
- The Ministry of National Education and Youth should **better clarify the expectations** of the introduction of notions and know-how throughout elementary school, or even from kindergarten⁸ The adoption of a more precise reading progression would allow better follow-up from year to year, within the same institution as between establishments. The relations with the curriculae and, especially with the learning objectives defined by the MEN and determining the drafting of evaluations (the knowledge and know-how expected at such and such a level), should also be clarified. For example, if it is essential that the teaching of the relationships between graphemes and phoneme (and reciprocally) be conducted intensively and systematically at the beginning of the preparatory class, the activities relating to the comprehension and enrichment of the lexicon cannot be neglected and must therefore lead to parallel teaching.

⁷ Defined by Deauvieu (2013) as "methods that combine visual recognition of words (...); play guessing (...); and an apprenticeship of the graphophonological code which is most often used here, unlike the syllabic method, in the form of "lessons of sounds" in which the pupil is invited to learn at the same time all the different transcriptions graphics of the same sound."

⁸ France could draw inspiration from the *national curriculum in England* which specifies in detail what needs to be learned, year by year. See <https://www.gov.UK/Government/publications/national-curriculum-in-England-framework-for-key-internships-1-to-4>, and especially for reading: <https://www.gov.UK/Government/publications/national-curriculum-in-England-English-programmes-of-study>

- Three audiences are concerned with manuals: pupils, teachers and parents. **Different and scalable formats**, made possible by the opportunities offered by it, could be envisaged: a small, very readable, and relatively stable format could include the essential points of learning and examples for pupils and parents; activities and exercises in Internet access would be developed for teachers, accompanied by explanations and elements of evaluation of their expected impact. For example, decoding (reading) practices should be accompanied by encoding (production) activities aimed at consolidating learning. The interest of such an organisation would be the diversity and the possible continuous expansion of activities (by contributions from practitioners and researchers, which raises the question of the admissibility of proposals) as well as to the adaptation to differences especially in the event of disability.
- The **initial and continuing training** of teachers should include information on the manuals available (editorial offer), the concepts that underlie them, and an introduction to the analysis of manuals and teaching technique proposals according to their conceptual and formal characteristics. More importantly, it should include extensive training in the psychology of the child and learning, the specificities of the French language and its spelling, in order to adapt the daily activities in class to the capacities of children and identify their difficulties in an essential step to support their learning. We hope that this document can, at least in part, fulfil this role.

III. Proposal for an analysis grid for reading manuals in preparatory class

On the basis of scientific data and field analysis, we can summarise what a preparatory class reading manual should be currently. This must:

- Quickly and systematically teach decoding (i.e. to train the phonological path, indispensable entryway into reading) and accompany it with corresponding encoding activities;
- Encourage the desire to read, and to practice the reading of decodable texts intensely, in order to automate decoding and promote the development of the lexical method;
- Give children effective tools to access the meaning of what they read, first orally and then gradually integrate writing. This action must aim at the development of vocabulary and the learning of the formal aspects of language (morphology and syntax), in other words the mastery of the French language;
- Clearly distinguish between activities that relate to the teaching and learning of decoding and encoding, activities that are the subject of language learning and oral and written comprehension.

From these foundations, we have drawn up a grid of criteria that any reading manual should have:

1. Ergonomics

A reading manual must include a high density of letters, syllables, words and texts readable by the child. The organisation of the page should allow the child to have a clear idea of what they should learn in each lesson.

As a result, we recommend:

- Do not overload the page with instructions that the child does not know how to read (e.g. "I read words", "I read phrases", etc., when the task is obvious here)
- Do not introduce unnecessary graphics or drawings (e.g. "r -^{*} o -^{*} ro", the arrows are useless here, and are an element of confusion; better to manipulate and combine cards or magnetic letters if you want to make the combination of letters work)
- Clearly separate what is intended for the child and, possibly to parents and teachers on the page (for example the left column can be reserved for parents, in a smaller font and in a different colour)
- Prefer sans serif typefaces and avoid the use of italics. Children who experience learning difficulties in reading as well as inexperienced readers seem to benefit from an increase in the size of the font (at a minimum of fourteen points) and the spacing of letters and words.⁹ The "dyslexia" font also offers a higher letter spacing than other fonts.¹⁰

⁹ Zorzi *et al.* (2012) ; Hakvoort *et al.* (2017).

¹⁰ It should be noted, however, that an experimental study restricted to twelve dyslexic children between 9 and 12 years of age did not find that its use improved reading (Wery & Diliberto, 2016).

2. Criteria for teaching decoding and encoding

A. Teaching begins with the systematic teaching of grapheme-phoneme correspondence

Each lesson introduces one or a few matches, that is, a letter or a letter string and its specific pronunciation (for example, "ch" is pronounced /ch/ as in "char"). For this step to be understood, one begins with letters whose correspondences with the sounds are devoid of ambiguity (e.g. "f", "j") and is pursued on the basis of a rational progression of difficulty which takes into account the ambiguity of grapheme and its frequency in French.

B. The learning of grapheme-phoneme correspondence occurs at a rapid pace

All scientific studies agree that it is important to quickly master a large number of correspondences, so that we can quickly decode a significant number of words. According to the "read and write" survey (Goigoux, 2016a), classes that teach more than eleven matches in the first two months get better results. The Académie de Paris recommends, and manages without difficulty to obtain, a tempo of 14 or 15 matches studied during the first nine weeks. Decoding activities must be accompanied by encoding activities with the same configurations: having learned to read do, ro, mo, etc., must lead to students being able to write these same configurations under dictation, and even transcribe some not (yet) decoded as long as their graphemes have already been taught.

C. The manual goes from grapheme to phoneme to minimise the memory load

At the beginning of preparatory class, it is important for the child to realise that reading is not about memorising the image of words, as a Chinese student would do, but to learn a code that has many regularities and is based on a principle of correspondence between letters and sounds. For this principle to be clear, it is necessary to concentrate the initial teaching on simple and unambiguous relations, which is true of most vowels (a, I, é, or, on...) and many consonants (b, d, f, j, l, m, n; p, t, v...) before introducing matches more complex and ambiguous. Do not present counter-examples in the first lessons (e.g. that the "i" in maison is not pronounced as i!), which adds to the confusion.

To pass from letters to sounds (reading), French spelling is relatively regular; while in the opposite direction, to pass sounds to the letters (dictation), there are many difficulties. For example the letter "o" reads most of the time /o/, but conversely the sound /o/ can be written o, AU, eau, aux, OT, OO in Zoo...; some sounds like /é/ may have up to fifteen different spellings.

That is why, at the beginning of learning to read, we suggest presentation of only one grapheme-phoneme relationship at a time ("o" is pronounced /o/). Some manuals immediately show all the possible writings of a sound, which is too much to remember, at least in the first lessons.

When the sounds are transcribed by several graphs, the sound /o/ for example, we will present very early at the beginning of the year, the simplest and most frequent spelling, (letter o ↔ /o/) and later the other two main graphs (au and eau). Most of the other graphs are derived from these three main graphs, and can be treated as the main graph followed by a mute letter. All the graphs can be repeated at the end of the year during a work on morphology, very important for the learning of spelling and the construction of the orthographic representations involved in the direct path.

D. The manual proposes a systematic progression, from the simplest to the most complex

To construct progression through grapheme-phoneme correspondence, it is also necessary to take into account their frequency and regularity in the direction of reading (from grapheme to phoneme) and in the opposite direction. Frequency tables have been established, for example in the Manulex-MorphO database (Peereman *et al.*, 2013) from all the words from fifty-four primary manuals, taking into account the morphological markings. This base was built as a result of Manulex-infra (Peereman *et al.*, 2007) which ignored morphology.¹¹

According to data from this table, the most frequent and regular grapheme-phoneme correspondences are, for vowels, "a" followed by "ou", "o", "é", and "on". In the early stages of learning to read, it is therefore possible to introduce these vowels, plus "eu", "i" and "u" (except when these last two are followed by another vowel as in *ciel* and *lui*) as well as the "e" at the end of a consonant-vowel Word (*le*, *je*, *te*...).

For consonants, the most frequent and the most regular are "r", followed by "l", then "p", "m", and "v". However, it may be interesting to introduce first the fricatives (f, j, ch, v) because they are also frequent and regular, but also to be produced in isolation and on a continuous basis--which is not the case of the occlusive (p, t, k...), which does not enable production of continuous sound. After "l" and "r", you can continue with "p", "b", "m", "n", "d" and "qu" (which is found in many function words), plus the "s" at the beginning of the word.

It is also important to pay attention to the complexity of syllables and words. We suggest starting off with short words composed of simple syllables called "CV", i.e. composed of a consonant (C) followed by a vowel (V) (like *la*, *le*, *jeu*, *feu*, *fou*, *chou*). Words with CVC structure (like *bal*, *sol*, *jour*) and CCV (like *tri*, *blé*, *bleu*) will be introduced in a second time. It may then be interesting to introduce minimal contrasts such as "Tu-ut", "fou-ouf", "tir-tri" and "dur-dru" to draw the attention of children to the importance of the order of graphemes in decoding.

The difficulties of spelling French must be addressed in a subsequent stage. Some difficulties are explained by morphology, others by contextual rules. The latter concern the pronunciation of "s", "c/g", and "e". For example, the consonant "s" reads/s/at the beginning of the word and when it is preceded or followed by a consonant (*liste*, *bourse*, *danse*) while, between two vowels or semi-vowels, it reads/z/(*arroser*, *arrosier*, *Chinois*), except when the preceding vowel is a nasal (and ends with a graphic consonant, as in "*danse*")¹². Another example is the grapheme "e" pronounced/E/in front of a double consonant (*belle*, *cette*, *presse*) as well as in a phonologically closed syllable (*sel*, *sec*) or orthographically (*les*, *effet*, *user*, *nez*).

E. The manual only proposes words and decodable texts

The child should not think that reading is in the form of a riddle. In each lesson, the manual therefore proposes only decodable words and texts. A decodable text is defined as a text containing a high proportion of regular words composed of grapheme-phoneme relationships that have already been taught.

¹¹ This progression partially repeats the one presented in Dehaene *et al.* (2011), which had been published prior to the establishment of the Manulex-MorphO database (Peereman *et al.*, 2013).

¹² except in rare pluri-morpheemic words like *parasol* or *tournesol*.

As things stand it is difficult to accurately quantify the optimal level of decodability to encourage the autonomous reading of novice readers. In the first lessons, where the child must understand the principle of reading, it is probably preferable to propose only syllables, words or small sentences that are totally decodable. Some manuals manage to reach 100% of decodability in all lessons, even if sentences sometimes appear to be constrained. In general, sufficiently decodable texts (containing between 70 and 85% of fully decodable words) promote the use of decoding procedures by pupils, as well as the accuracy and fluidity of reading of beginner readers. The "Anagraph"¹³ Platform allows teachers to estimate the decodability of the texts they read to their pupils according to the grapheme-phoneme correspondences already studied in their class.

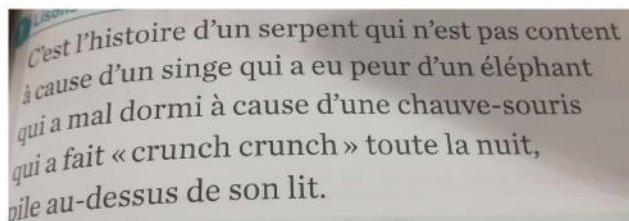
Briefly mention the special case of the "Toolbox" words, i.e. very frequent words, which are necessary for many sentences (le, un, son...). There is no reason to make it a controversy. In fact, most of these words are regular, and can therefore be introduced as the corresponding grapheme-phoneme correspondence is learned. Few toolbox words are both irregular and very common (for example the words "et", "sept", "dix", the "est" of the verb être, the "eu" of the verb to have...). As we perceive it, their insertion in the texts does not seem to result in a negative effect insofar as their number is limited (a dozen should suffice). It should be noted, however, that building sentences that avoid these irregular words is not impossible, and that this may seem desirable to avoid confusion or contradiction in teaching instructions.

F. Regular revisions

As with any learning, the items learned in the preceding weeks or months should be reviewed regularly. They can be mixed with the last matches learned. Regular revision facilitates memorisation and automation. Various exercises can be proposed: reading word-image correspondence, Word hunting... These exercises must immediately test the knowledge acquired and allow revision of previous achievements. These exercises are also games that delight the child and show the pleasure to be found in words.

G. Reading texts become longer as learning progresses

Long texts allow the child to encounter more varied syntactic structures and to become accustomed to the written structure of the language, and to the marks of punctuations. Nevertheless, it is necessary to adapt the structure of texts to the linguistic capacities of children at a given age. The author can please themselves but bear in mind the possibilities of their reader. The counter-example in this case is related to a work memory task that is too onerous for preparatory classes!



H. The manual offers writing exercises in parallel with reading

Writing or encoding activities facilitate learning to read. Writing begins with isolated letters, then readable words at each lesson, and finally a real production of short writings, and corrected immediately in case of misspelling or syntax.

¹³ Riou (2017), <http://anagraph.ens-lyon.fr>

3. Criteria for the teaching and understanding of the French language

Beyond mastering decoding, research shows that it is useful to explicitly teach text comprehension strategies. This teaching is conducted orally from kindergarten and, of course, during the first cycle, where they gradually integrate work on writing. It is clearly identified, regular and distinct from the teaching of decoding which must represent most of the teaching time at the beginning of preparatory class. It becomes more and more important as pupils progress in reading. Its main objective is to promote the mastery of written language. It may, if necessary, be the subject of a separate manual from the instruction manual for the alphabetical code. Here we propose some criteria for teaching the comprehension of French.

A. The manual allows access to a rich, even ambitious vocabulary, first worked orally, and then as soon as possible both orally and in writing

Books provide access to new worlds, different from everyday reality, and enrich vocabulary. This one is better understood if it is met in various situations. A new Word encountered in reading for example, must be reused in the structured and independent learning moments that will lead the pupils to read them, hear them and produce them in many contexts (condition of their memorisation) and to become aware of their meaning. These structured moments also allow the presentation and use of many other words that will enrich the lexical baggage of the pupils.

B. The manual teaches the morphology of the words

Work on the morphology of the language is a privileged point of linking the oral and the written. Working on the word families helps to enrich the vocabulary and to automate the reading of the morphemes, i.e. to streamline reading by the implicit recognition of the Constitution of the word when reading text (grandement, facilement, joliment, etc.).

The flexional morphology, in preparatory class, mainly concerns the most common types and number marks (for example, the final "s" of the plural names, the "-ENT" end of the verbs, the final "e" of the feminine adjectives). Too few reading manuals devote specific lessons to the marks of the plural, for example.¹⁴

C. The Manual provides explicit and structured teaching of understanding

Reflecting and reasoning on the content of the statements is an essential and unintuitive aspect of the activity of comprehension, especially for children who have a low level of language and for those who have little experience of the formal language specific to the texts.

Learning to understand is largely a matter of discussion and argument. It is important for pupils to be able to express themselves in order to clarify how they manage to give this or that interpretation and debate each other and with the teacher on the interpretation to be remembered. This teaching is conducted more easily with small groups of pupils (from 5 to 8). It is important to ensure that everyone can be interviewed and take the floor.

D. The manual progressively proposes varying, attractive and increasingly complex texts addressing diverse genres

The texts read by adults and those read by pupils must be clearly identified throughout the year; the complexity of the texts to be read by the children increases according to their reading abilities.

¹⁴ Thévenin *et al.* (1999), Fayol (2003).

The comprehension of the texts implies the mastery and the coordinated use of many skills that can all be the source of difficulties at some point. These obstacles must be identified and worked out using specific exercises. The challenge at the preparatory course is not to achieve a very precise formalisation of comprehension strategies, but to teach students that the text can be a source of difficulty (recognising that one may not understand) and that one can reason in order to overcome these obstacles (to equip them with a few procedures).

There is currently no strict progression for preparatory class, with all the skills being at varying degrees involved in each text, and much research is still to be conducted to know the effectiveness of the teaching of such or such strategy in preparatory class. Here, however, we can cite the main skills identified by the theoretical analysis of the activity of comprehension:

- Analyse the grammatical morphemes that indicate the genre, the plural, the time of the verbs...- understand the grammatical words that describe the space (on, under, in...) and the time (before, after, during, etc.) Understanding causality
- Understand the references (for example, to determine who is mentioned by a pronoun like "he", "she" (il or elle) etc.)
- Identify the approximate meaning of an unknown word from the context
- Select the meaning of a polysemic word in its context
- Interpret complex syntactic structures (relative, passive...)
- Know how to distinguish what is said (the explicit) and what is implied. Work on the implicit enables work on different types of inferences and learning to draw the analogy between what the text says and what we know.
- Identify the main idea of a paragraph, summarise it or reformulate it with their own words.
- Identify the essential interpretation of other ancillary information in order to be able to answer a question

4. Pitfalls to be avoided

The members of the Scientific Council of National Education were surprised at the abundant diversity of reading manuals available in France. Some of these include elements that are contrary to all the principles set out above. Here we list a number of the pitfalls that we think must be avoided.

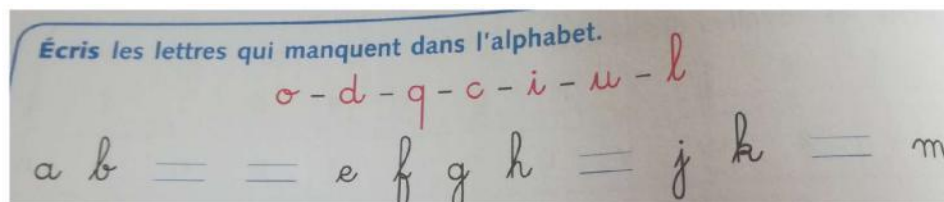
A. Distract the child from the job in hand

Many manuals are explicitly presented as "mixed". They teach decoding of course, but also many other things supposed to facilitate understanding, a taste for reading, motivation... These ancillary activities sometimes have absolutely nothing to do with learning to read. They interfere with the reading time and divert the child's attention. Remember here that pupils in preparatory class must be engaged in reading activities at least 30 minutes a day.

Here are some examples of distractions that seem questionable:

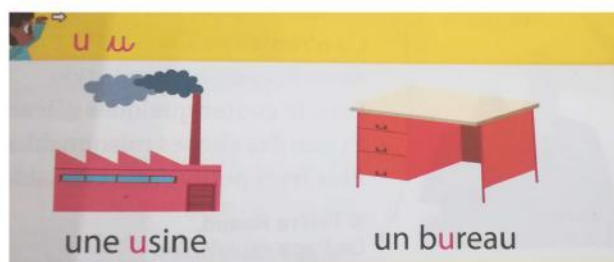
- The insistence on the names of the letters. The names of the letters (R is called 'Aire'), which are learned from kindergarten, are not necessarily related to their pronunciation (R is pronounced /r/). The insistence on the names of the letters, and not on their pronunciation, is likely to confuse the child: How can they understand that R + O makes the sound/ro/and not "Aire-o" or "héros"?

- **The recitation of the alphabet.** Letters are not numbers and knowing their alphabetical order plays no role in reading (although it will be useful later to search for words in the dictionary). In the example below, what is the point of dedicating the fourth reading lesson to "write letters that are missing in the alphabet".



The use of the phonetic alphabet.

How can one imagine that it is useful to explain to a child that "y = u" or "u = or" (see opposite)? The phonetic alphabet is a source of confusion, it has absolutely no place in a reading book for children.



This manual teaches, at the beginning of the year, the sound /u/, associating it with the word "usine". Very well! But what interest to use also the phonetic alphabet, in which the sound /u/ is written [y]? And why give the word "lundi" as counter-example where the letter

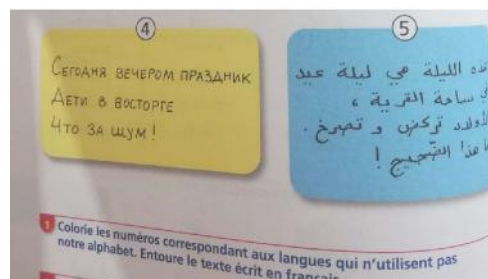
- **The use of counter-examples.** What about a manual that, teaching the sound /u/, hastens to say that it is not heard in "lundi"? Likewise, we saw a manual that introduces the sound /a/ from the first lesson, but feels obliged to clarify that it is not heard in "maison"... At this stage, the pupil needs to know how to pronounce these letters in the words they will meet, thus in decodable texts. Making them learn the exceptions at the same time as the rules can only overload their working memory and induce confusion.
- **Locating the outline of a Word.** Some exercises require the child to identify the overall profile, formed in particular by its ascending and descending letters (see the word "lapin"). In the current state of scientific knowledge, these exercises have no relation to reading: it depends on the identification of each of the letters, not their overall contour, and remains otherwise unchanged when one goes in uppercase (lapin/LAPIN).
- **Merging words.** The use of a blank between words is a remarkable invention that allows quick access to the lexicon. Why deprive ourselves of this invention, as, flying in the face of common sense, in some manuals, which write for example:

« Partoute lama giedumon de, quel eprin cedevien neu ncra paud! »

(you are supposed to read: "Par toute la magie du monde quel prince devienne un crapaud!").

This ridiculous presentation is all the more detrimental to the young reader that they must help themselves using the oral lexicon to validate the quality of their decoding of words. This type of segmentation penalises them and prevents them from automating reading. Like any error presented by the one who holds the Authority (the adult, the book), this can make them lose confidence, or make them learn an erroneous spelling.

- Making their own book. Some manuals consider it useful to "enter the world of reading" by constructing their own book... not by writing it, but by cutting out pages and linking them! Manual work activities are important, but they are not reading.
- Texts in other scripts. To show sentences in Cyrillic or Arabic is undoubtedly a welcome cultural opening, but it does not help with learning to read. Certainly, the child must quickly pay attention to the sense of reading, which goes from left to right in our alphabet, but it is not by showing them counter-examples that we can teach them effectively.



B. Divert attention from the alphabetical code

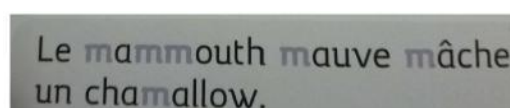
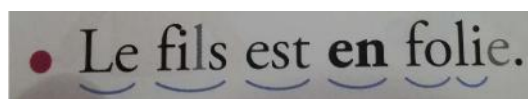
The child must understand that reading is based on a code that associates each letter or group of letters with a phoneme, in a systematic order, from the left to the right. This code is not intuitive and any task that diverts it, not only does not help it but can be harmful by directing it towards the wrong strategy. Reading-guessing is to be avoided in the first weeks of learning. When they are a better reader and have correctly integrated the principle of this code, one can be less strict because a more expert child can make assumptions and therefore can deduce certain sounds according to what they already know, even if they do not know all the graphemes presented.

On this basis, it may be advisable not to read whole words or phrases that the child will find impossible to decode.

However, the members of the CSEN were overwhelmingly surprised to find that many manuals continue to offer children, from the first week, sentences to read in their entirety, without any keys to enable decoding.

1. For example, one manual gives "read" as an instruction, from the first week of class, using the phrase "il y a des garçons et des filles à l'école".
2. Another manual asks the child to distinguish a recipe from a newspaper article from the first week, when the child does not know how to read! Not only does this activity have nothing to do with learning to read, but you can't see how the child can avoid this conundrum.
3. Moreover, the irregularity and sometimes the agrammatical character of the proposed sentences also leaves room for concern. And this, without the content gaining in wealth or interest compared to decipherable texts. In the example opposite, the sentence is barely French, and the word "fils" is one of the most irregular of French.

We recommend respect for the French regularities as much as possible, especially in the initial lessons. In the example opposite, supposed to illustrate the learning of the pronunciation of the letter "m", always in the first weeks of reading, what interest to introduce the graphs "outh" and "Ow" that are not regular French suites, and that cannot be decoded by the child at this stage?



5. Outstanding issues

As we can see, teaching methods for learning to read abound with ideas, sometimes extremely ornate. Among the most widely accepted and widespread, the Working Group questioned the relevance of pedagogical methods that require the learning of additional information, without reaching a conclusion.

Hand gestures. In some methods, otherwise recommendable for their insistence on the phonological code, one asks the child to learn a hand gesture for each letter, often without obvious connection with the form of the letter, nor the one of the mouth that pronounces the phoneme. These gestures are therefore an additional code to learn, different from that of the letters and different from the articulatory movements of the oral language. Is it a mnemotechnical help? Or, on the contrary, a distraction? The current scientific literature does not make it possible to decide – it certainly shows that it is useful to associate images of a mouth in the process of pronouncing the corresponding phonemes¹⁵ with the letters that one teaches, but to our knowledge, does not say whether these gestures can be replaced by hand configurations. Perhaps these gestures can be useful in children with deafness or phonological disorders, to remove ambiguity from certain sounds, but in order to be able to offer them to all children, it would be necessary to scientifically demonstrate their usefulness in the schoolroom.

Les gestes Borel-Maisonny (1)				Les gestes Borel-Maisonny (2)			
[a]	a		J'ouvre ma main et je dis « a ».	[on]	on om		Je pose le o sur mon nez et je dis « on ».
[i]	i y		Je lève mon doigt et je dis « i ».	[an]	an, en am, em		Je pose le a sur mon nez et je dis « an ».
[o]	o au, eau		Je forme un rond avec mes doigts et je dis « o ».	[in]	in im, ain, ein		Je pose le i sur mon nez et je dis « in ».
[u]	u		Je lève mes deux doigts et je dis « u ».	[oi]	oi		Mes doigts se joignent puis s'ouvrent et je dis « oi ».
[é]	é er, ez		Je mets ma main en avant comme un accent et je dis « é ».	[oin]	oin		Je ferme mes deux doigts sur le i et j'ouvre et je dis « oin ».
[è]	è, ê ai, ei, et		Je mets comme un accent grave.	[euil]	euil ouill		Je mets mon index sur mon nez et je dis « euil ».
[e]	e eu, œu		Je forme une main ouverte.	[ouil]	ouil ouil		Je mets mon index sur mon nez et je dis « ouil ».
[eu]	eu, œu		Je mets mes deux doigts sur mon nez et je dis « eu ».	[ion]	ion œu		Je mets mon index sur mon nez et je dis « ion ».
[ou]	ou		Je forme un rond et je dis « ou ».				

Anthropomorphisation of letters. Other methods use faces or characters to represent the letters. Each letter is associated with an attractive character, whose body or face shape evokes the corresponding letter, and teachers devote the first few days of teaching reading to staging all these characters. Again, the idea is to introduce, in a transitional way, a mnemotechnical and motivating way to remember the

¹⁵ Boyer et Ehri (2011).



form and sound of the letters. In its favour, several converging studies have demonstrated the usefulness, in order to facilitate the memory of the grapheme-phoneme correspondence, to associate each letter to the drawing of an object whose shape resembles that of the letter,

and whose name begins with the phoneme (for example, the letter S represented by a snake).¹⁶ However, these are minimal and carefully selected drawings. Conversely, some research suggests that excessive pictographic enrichment of books, especially through anthropomorphising, can distract young children's attention from the relevant properties of the objects being taught, and make the process of symbolic abstraction more difficult.¹⁷ On the other hand, at the cerebral level, the cortical areas associated with the recognition of faces and letters are distinct and compete during development.¹⁸ These few elements of doubt are not conclusive, and the Working Group calls for new controlled studies to the extent that they alone would enable us to decide under what conditions the effect of the memory-jog prevails over distraction.

6. Other generic recommendations

Beyond the specific question of teaching reading, any manual should obey simple rules of ergonomics, accessibility, simplicity and transparency for all its users (children, teachers, parents). The following is a small list of generic, non-exhaustive recommendations that can also be considered as selection criteria.

- The manual does not use jargon or unnecessarily technical vocabulary.
- The manual does not spread neuro-myths, nor does it rely on Neuroscience for no good reason.
- The manual is sufficient unto itself: it proposes, at each stage, pedagogical activities directly usable by the teacher, without needing to use photocopies or other additional materials.
- The manual does not present learning as stressful: we were surprised to find that many manuals present stressful situations, either by associating school and fear, or by disproportionately using stories with ghastly images of horror. It may be difficult to want to open a book that contains illustrations like this one.
- The manual contains a section for teachers: short, clear and devoid of jargon, it clarifies in a few pages the pedagogy and objectives of the year.
- The manual contains a section intended for parents: short, clear and devoid of jargon, it explains the objectives of the year, the pedagogical progression and the way in which parents can intervene in addition to classroom activities.



¹⁶ De Graaf *et al.* (2007) ; Di Lorenzo *et al.* (2011) ; Ehri *et al.* (1984) ; Shmidman et Ehri (2010).

¹⁷ Strouse *et al.* (2018) ; Chiong et DeLoache (2013).

¹⁸ Dehaene *et al.* (2010 et 2015) ; Kolinsky *et al.* (2018).

- The manual is "inclusive"-its digital format (HTML, XML) allows adaptations to the various specific needs of children with disabilities (size of characters, passage in Braille, reading aloud, etc.).
- The price of the manual is reasonable.
- The weight and volume of the manual are reasonable.

IV. The example of the "reading plan" deployed in 2017-2018 in the Académie de Paris

How do you move from these principles to their practical implementation? As we pointed out, it is not the manual that teaches, but the teacher. The choice of a manual is therefore not enough on its own but must be part of a general policy of teacher training and general mobilisation of all actors in national education.

In order to reflect on these issues, the Scientific Council for National Education interviewed Mr. Antoine Destres, DASEN (academic Director of the national education services) of the Académie de Paris. Indeed, this Academy led, under its direction, a global action called "the reading plan", wherein selection of reading manuals was just one element among others. It seemed interesting to us to report this experience, without prejudging the possibility that other academies would carry out other similar projects. The following items were written by Antoine Destres, with a final commentary from the CSEN.

Contrary to popular belief, priority education concerns a large number of classes of the Paris Academy, about one third of schools and pupils. At the start of 2017, the 53 REP+ preparatory classes were doubled, and this number increased to more than 400 at the beginning of the year 2018. On this occasion, the Rectorate (Education Authority) completely redesigned its reading teaching device in 2017/2018, before the wider deployment of 2018, and then the extension in 2018/19 to all preparatory class teachers, whether or not they teach in REP or REP+. In total, more than 850 preparatory class teachers are trained in "read/write" in 2018/2019. The question of the reading manual was only one element of this new strategy, which included four points:

- An extensive didactic and pedagogical organisation
- A systemic design of the scheme
- A teacher training personnel method which combines a great didactic expertise, a strong presence in the classes and benevolent attitude towards teachers
- The introduction of the manual as the result of elements apprehended in training.

1. An extensive didactic and pedagogical organisation

As soon as the ministerial announcement of the doubling of the REP+ in preparatory classes the Academy management wished to mark its commitment and the very pragmatic dimension of the approach by conducting working meetings and distributing information to all of the schools, including the principals of schools, trade union organisations, and the parent-teacher associations. This information focused on the issues and methods, and then on the development of the scheme. The exchanges were supported between the Rectorate (Education Authority) and the schools through the active presence of national education inspectors (meetings on many levels, visits to schools sometimes accompanied by elected officials, city leaders, Academy inspectors or regional teaching inspectors). DASEN visited the fifty-three classes initially involved and met with each teacher. The 100 teacher training personnel, the ESPE humanities teachers and the seventy pedagogical advisors gathered in June to discover the results and take ownership of their roadmap.

2. A systematic design of the scheme

To meet the challenge of "100% success in preparatory class", the input had been multiple:

- Work on the jobs to be created was carried out for each school: to avoid tensions on this issue, guidelines were designed for each school and communicated to the trade unions with strong attention to the pupil numbers in the other levels.

- A close collaboration was established on the issue of **premises** with city officials to achieve "real duplication" everywhere. To do this, it was necessary to negotiate between staff, rehabilitation work, etc. The result in a city where the school building is hardly extendible - is very positive: 93% of preparatory classes operate in 2018/2019 mode: a group/teacher/premises;
- The teachers' assignment was somewhat waived from the usual rules for placing motivated teachers in front of the pupils and maintaining them the following year;
- The teachers were associated **in pairs**. The constraint of replacement during training (the teacher remaining at the school takes the place of their colleague in training) had very positive consequences: same progressions, same manuals, common preparations, training of support groups...

On the essential level of **training**:

- A **Group of** expert training personnel on the issue of reading was closely accompanied by an inspector whose competence is recognised at all levels. A training personnel member was instructed to follow up in the classrooms alongside the constituency advisors. In 2018/2019, 3 people were dedicated full time to this proximity accompaniment.
- **Training of the teaching advisors** has been set up: 4 half-days in the year: an indispensable prerequisite for homogeneous speeches and councils to be held to the teachers.
- A **4-day training course** (one per period) was organised **for each of the preparatory class teachers** in priority education (reduced to 2 days for the other schoolteachers).

The themes discussed during each of these 4 days were as follows:

- The reader project
- Grapheme-phoneme correspondence
- Cursive writing
- Exercises related to writing: encoding, dictation, copying, written production
- Vocabulary, lexical morphology
- Grammatical morphology
- Understanding: strategies on texts heard, on texts read
- Reading aloud
- Differentiation

In November, time was spent on the analysis of manuals used by teachers.

This training is mainly judged by the teachers as, solid, concrete, progressive, ambitious, then accompanied on the ground by the pedagogical counsellors and the dedicated trainers. This training has induced sometimes radical changes, especially on the teaching of code and understanding and thus on the choice of manuals.

In terms of the pedagogical continuum between the preparatory class and the other levels, finally:

- The **liaison with the kindergarten** could be re-examined and the exchanges between professionals have progressed, allowing adjustments on the learning (especially in terms of phonological consciousness and graphic gesture).
- Teachers of **other class levels** have often looked with interest at this "peaceful tsunami" that was occurring in preparatory class. The lines are moving in some schools and there is a serious question of continuity in the second or even beyond.

- **The Ecole Supérieure de Professorat et d'éducation (ESPE)** of the Académie de Paris has integrated the application by allowing Rectorate (Education Authority) training personnel to work with its teachers, in order to intervene on reading with pupils at master 2 level.

3. Training: didactic expertise, presence in classrooms, and benevolence towards teachers

Training strives to adapt to the contexts in which teachers work and their practices. The evolution of these is due in large part to the climate of benevolence and listening during training times, and to the didactic expertise of the Group of training personnel. Attendance, punctuality of teachers and very positive feedback during final evaluations are evidence of this.

The teaching recommendations proposed in training are argued and practical illustrations allowing teachers to grasp them without delay for implementation in the classroom. Specific didactic proposals are put forward to address the difficulties reported by teachers, enabling them to engage in practical changes. To the extent that they were observing, from one period to the next, the progress of pupils, the climate of confidence comes out strengthened.

The accompaniment of training personnel in classrooms and schools is differentiated as pupils progress, in relation to the difficulties experienced by teachers.

As a result of this global organisation, specific advice on the choice of manuals and tools for pupils was followed and appreciated.

4. The introduction of the Handbook as the result of elements apprehended in training

The designers of the "reading plan" of the Académie de Paris took into account the great sensitivity of the subject: the manual is the symbol for many teachers, of teaching freedom, and has been the impetus in the past of highly lively ideological debates. If the Académie de Paris has so far succeeded in avoiding these pitfalls, the first three points developed in this note are probably not alien notions. To these, it is necessary to add the place of the subject in the training of teachers.

Based on the work presented above, the training personnel emphasise the distinction between the tools and the time for the code and the functioning of the language on the one hand, and the comprehension and vocabulary on the other, until reaching autonomy and fluidity of decoding. Specifically, they advocate:

1. The use of a manual to teach the code:
 - The most regular and most frequent grapheme/phoneme correspondences;
 - A sustained rhythm of the correspondence studies;
 - The training and automation of the grapho-phonemic code and the combination;
 - Increasingly complex syllabic structures;
 - Decodable texts;
 - Memorisation of orthographic and grammatical knowledge.
2. The use of a method to teach comprehension:

To understand a text, i.e. to make a coherent mental representation that integrates all the information of the text, assumes, once the words are identified, activating the explicit and implicit meaning, but also understanding their implementation relationship, mobilising grammatical knowledge and cultural knowledge: and this is achieved:

- From texts read orally by the teacher to develop comprehension strategies;
- from excerpts from youth albums and documentaries that present a resistance to literal comprehension, and a high percentage of decodability. The rate of decodability is identified with the anagraph Platform (<http://anagraph.ENS-Lyon.fr>).

Training personnel insist on an important condition for success: the reading of texts chosen to implement the strategies of comprehension must aim to provide **pleasure** to the pupils, such as that experienced with the texts heard before they were able to decode.

After sharing these findings with the teachers, as well as recent research inputs, the thirteen manuals used in the 53 REP+ classes were analysed with clear elements summarised in Zone 1. On this basis, the manuals could be classified into three categories: those whose pedagogy corresponds well to the elements selected, and which should therefore be effective (4 manuals); those requiring many choices and/adaptations by teachers; and those not retained as relevant by teachers.

Zone 1. Key points identified by the Académie de Paris for the analysis of manuals as part of its "reading plan"

- Reading is primarily decoding;
- The syllabic approach is the most effective way to learn to read in the preparatory class;
- The proposed texts are decodable;
- Writing plays an important role in learning and improving reading;
- Learning to read must integrate the ambitious development of the lexical repertoire;
- Writing and dictation exercises are daily;
- Observation of the functioning of the language: to manipulate and memorise the main regular lexical orthographic forms, initiating the teaching of morphology; Structuring and categorising the lexicon;
- Written activities including copying, dictation and production of sentences;
- Teaching understanding and making visible strategies.

It was naturally necessary in January 2017 to suggest to the city not to publish manuals remote from these recommendations and curriculae of 2016 in the catalogue of the DASCO of Paris (in which the teachers place their orders in January)

In 2017-2018, five manuals were selected:

- *Lecture piano*, by Sandrine Monnier-murariu, Chez Retz

- *Je lis, j'écris*, by Reichstadt, Terrail and Krick, at the blue letters
- *Pilotis*, by Delphine tendron, at Hachette education
- *Taoki*, by Carlier and Le Van Gong, at Istra
- *Tu vois Je lis*, by Françoise Monnier-Roland and Claudine Barrou-fret, at sedrap

In 2018-2019, after teachers' feedback, only the first two were retained.

In conclusion, according to Antoine Destres, "the choice of reading manual which is one of the keys to the success of the pupil in preparatory class has not given rise in Paris to controversies foreign to the real stakes: pupils who know how to read and sometimes read very well at the end of preparatory class".

5. Final commentary of the Scientific Council for national education

The approach followed by the Académie de Paris actually shows that it is possible, in the overall context of a mobilisation of all actors, to reach a consensus on the issue of teaching methods and reading manuals in preparatory class. That is an exemplary approach.

However, the Scientific Council must emphasise that there is still a key element missing: an **objective assessment of student progress**. Such an assessment, in relation to a control group, should systematically be part of all innovative mechanisms to national education. In fact, it alone enables

1. Objective analysis if progress is real
2. To dispassionately debate by leaving the ground of controversy to turn towards objective data
3. Engaging teachers in a process of scientific questioning
4. Facilitating the adoption of best teaching practices
5. Avoiding the adoption of practices that are not justified by concrete results
6. Continue the analysis by studying to what extent the impact varies according to the geographical, social or linguistic context, and whether it can still be improved

The Scientific Council therefore asked one of its members (Jérôme Deauvieu) to carry out the retrospective evaluation of the "reading plan" of the Académie de Paris. A comparative analysis of the results obtained by the REP + pupils in the DEPP evaluations is being implemented. It alone will make it possible to objectify the results of pupils, even if those reflected by local protocols and by the feeling of teachers seem already very positive.

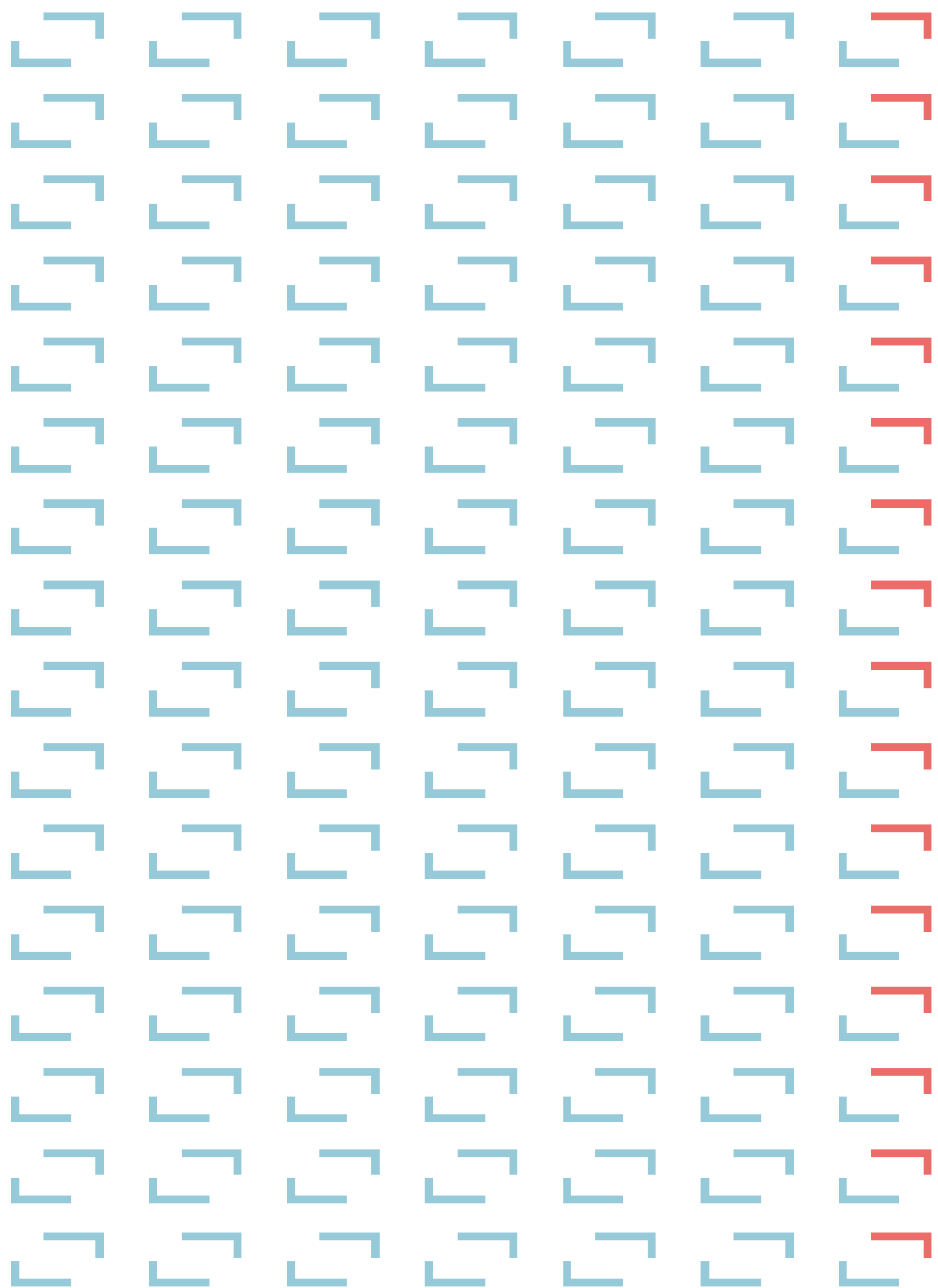
Finally, the Scientific Council stresses that the two manuals that have been retained at the Académie de Paris are not "scientifically validated" (if this expression has any meaning). Their effectiveness has not been the subject of a randomised evaluation and moreover, only thirteen of the few thirty-five manuals available have been analysed by teachers, researchers and inspectors of the Académie de Paris. It is therefore quite possible that other manuals are also suitable. Nevertheless, the whole approach shows that it is already possible to select, among the plethora of manuals proposed by the publishers, a small number that correspond to the pedagogical criteria identified above and supported by scientific research. National education could have much firmer recommendations in this area than in the past.

V. Bibliography

- Bara, F. & Gentaz, E. (2010). Apprendre à tracer les lettres : Une revue critique. *Psychologie Française*, 55(2), 129-144.
- Bara, F. & Gentaz, E. (2011). Haptics in teaching handwriting: The role of perceptual and visuo-motor skills. *Hum Mov Sci.* <https://doi.org/10.1016/j.humov.2010.05.015>
- Bianco, M., Pellenq, C., Lambert, E., Bressoux, P., Lima, L., & Doyen, A.-L. (2012). Impact of early code-skill and oral-comprehension training on reading achievement in first grade. *Journal of Research in Reading*, 35(4), 427–455. <https://doi.org/10.1111/j.1467-9817.2010.01479.x>
- Boyer, N., & Ehri, L. C. (2011). Contribution of Phonemic Segmentation Instruction With Letters and Articulation Pictures to Word Reading and Spelling in Beginners. *Scientific Studies of Reading*, 15(5), 440–470. <https://doi.org/10.1080/10888438.2010.520778>
- Casalis, S. & Colé, P. (2018). Le morphème, une unité de traitement dans l'acquisition de la littéracie. *Langue française*, N° 199(3), 69–81
- Casalis, S., Pacton, S., Lefevre, F., & Fayol, M. (2018). Morphological training in spelling: immediate and long-term effects of an interventional study in French third graders. *Learning and Instruction*, 53, 89-98.
- Castles, A., Rastle, K., & Nation, K. (2018). Ending the Reading Wars: Reading Acquisition From Novice to Expert. *Psychological Science in the Public Interest*, 19(1), 5–51.
- Chevrot, J.-P., Dugua, C., & Fayol, M. (2009). Liaison and word segmentation in French: A usage-based account. *Journal of Child Language*, 36, 557-596
- Chiong, C., & DeLoache, J. S. (2013). Learning the ABCs: What kinds of picture books facilitate young children's learning? *Journal of Early Childhood Literacy*, 13(2), 225–241.
- Deauvieau, J., Reichstadt, J., & Terrail, J.-P. (2015). *Enseigner efficacement la lecture: Une enquête et ses implications*. Paris : Odile Jacob.
- Dehaene, S. (2007). *Les neurones de la lecture*. Paris : Odile Jacob.
- Dehaene, S. (2011). *Apprendre à lire: des sciences cognitives à la salle de classe*. Paris: O. Jacob.
- Dehaene, S., Cohen, L., Morais, J., & Kolinsky, R. (2015). Illiterate to literate: behavioural and cerebral changes induced by reading acquisition. *Nature Reviews. Neuroscience*, 16(4), 234–244. <https://doi.org/10.1038/nrn3924>
- Dehaene, S., Pegado, F., Braga, L. W., Ventura, P., Nunes Filho, G., Jobert, A., ... Cohen, L. (2010). How learning to read changes the cortical networks for vision and language. *Science*, 330(6009), 1359–1364. <https://doi.org/10.1126/science.1194140>
- De Graaff, S., Verhoeven, L., Bosman, A. M., & Hasselman, F. (2007). Integrated pictorial mnemonics and stimulus fading : Teaching kindergartners letter sounds. *British Journal of Educational Psychology*, 77(3), 519–539.
- DiLorenzo, K. E., Rody, C. A., Bucholz, J. L., & Brady, M. P. (2011). Teaching letter–sound connections with picture mnemonics: Itchy's alphabet and early decoding. *Preventing School Failure: Alternative Education for Children and Youth*, 55(1), 28–34.
- Dugua, C., Spinelli, E., Chevrot, J.-P., & Fayol, M. (2009). Usage-base account of the acquisition of liaison : Evidence from sensitivity to plural/singular orientation of nouns. *Journal of Experimental Child Psychology*, 102, 342-350.
- Ehri, L. C., Deffner, N. D., & Wilce, L. S. (1984). Pictorial mnemonics for phonics. *Journal of Educational Psychology*, 76(5), 880.

- Ehri, L. C., Nunes, S. R., Willows, D. M., Schuster, B. V., Yaghoub-Zadeh, Z., & Shanahan, T. (2001). Phonemic awareness instruction helps children learn to read: Evidence from the National Reading Panel's meta-analysis. *Reading Research Quarterly*, 36, 250–287.
- Fayol, M. (2003). L'acquisition/apprentissage de la morphologie du nombre : bilan et perspectives. *Rééducation Orthophonique*, n° 213, 151-166.
- Foulin, J-N. (2005). Why is letter-name knowledge such a good predictor of learning to read? *Reading and Writing*, 18, 129-155.
- Foulin, J-N. (2007). La connaissance du nom des lettres chez les prélecteurs : aspects pronostiques, fonctionnels et diagnostiques. *Psychologie Française*, 52, 431-444.
- Goigoux, R. (2016a). Apprendre à lire et à écrire au cours préparatoire : enseignements d'une recherche collective. *Revue française de pédagogie*, (196), 5–6.
- Goigoux, R. (2016b). *Lire et Ecrire. Etude de l'influence des pratiques d'enseignement de la lecture et de l'écriture sur la qualité des premiers apprentissages*. Université de Lyon, Institut français de l'Éducation, ENS de Lyon. Rapport de recherche remis à Madame la directrice générale de l'enseignement scolaire (DGESCO-MENESR), Ministère de l'Éducation nationale, de l'Enseignement supérieur et de la Recherche. En ligne : <http://ife.ens-lyon.fr/ife/recherche/lire-ecrire>
- Graaff, S. de, Bosman, A. M. T., Hasselman, F., & Verhoeven, L. (2009). Benefits of Systematic Phonics Instruction. *Scientific Studies of Reading*, 13(4), 318–333.
- Hakvoort, B., Van den Boer, M., Leenaars, T., Bos, P. & Tijms J. (2017). Improvements in reading accuracy as a result of increased interletter spacing are not specific to children with dyslexia. *Journal of Experimental Child Psychology*, 164, 101-116. <https://doi.org/10.1080/10888430903001308>
- Kolinsky, R., Morais, J., Cohen, L., & Dehaene, S. (2018). Les bases neurales de l'apprentissage de la lecture. *Langue française*, (199), 17–33. <https://doi.org/10.3917/lf.199.0017>
- Landerl, K. (2000). Influences of orthographic consistency and reading instruction on the development of nonword reading skills. *European Journal of Psychology of Education*, 15(3), 239. <https://doi.org/10.1007/BF03173177>
- Legendre, G., Barrière, I., Goyet, L., & Nazzi, T. (2010). Comprehension of Infrequent Subject–Verb Agreement Forms: Evidence From French-Learning Children. *Child Development*, 81(6), 1859–1875. <https://doi.org/10.1111/j.1467-8624.2010.01515.x>
- Leroy, M. (2012). *Les manuels scolaires: situation et perspectives* (Rapport de l'IGEN No. 2012–036). Retrieved from <http://www.education.gouv.fr/cid61373/les-manuels-scolaires-situation-et-perspectives.html>
- Morais, J., Robillart, G., Bentolila, A., Buser, P., Collectif. (1998). *Apprendre à lire: Au cycle des apprentissages fondamentaux (GS, CP, CE) Analyses, réflexions et propositions*. Paris : Editions Odile Jacob.
- National Institute of Child Health and Human Development. (2000). *Report of the National Reading Panel. Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction (NIH Publication No. 00-4769)*. Washington, DC: U.S. Government Printing Office.ONL. (2007).
- Observatoire National de la Lecture (2007). *L'enseignement de la lecture et l'observation des manuels de lecture du CP*. Rapport disponible en ligne sur http://onl.inrp.fr/ONL/publications/publi2007/Rapport_ONL_2007.pdf

- Pacton, S. & Fayol, M. (2000). The impact of phonological cues on children's judgments of nonwords plausibility: the case of double letters. *Current Psychological Letter*, 1, 39-54.
- Pacton, S., Perruchet, P., Fayol, M. & Cleeremans, A. (2001). Implicit learning out of the lab.: The case of orthographic regularities. *Journal of Experimental Psychology: General*, 130, 401-426.
- Paulesu, E., McCrory, E., Fazio, F., Menoncello, L., Brunswick, N., Cappa, S. F., ... Frith, U. (2000). A cultural effect on brain function. *Nat Neurosci*, 3(1), 91-96.
- Peereman, R., Lété, B., & Sprenger-Charolles, L. (2007). Manulex-infra: distributional characteristics of grapheme-phoneme mappings, and inflexional and lexical units in child-directed written material. *Behav Res Methods*, 39(3), 579-589.
- Peereman, R. & Sprenger-Charolles, L. (2018). Manulex-MorphO, une base de données sur l'orthographe du français intégrant les morpho-phonogrammes. *Langue française*, N° 199(3), 99-109
- Peereman, R., Sprenger-Charolles, L. & Messaoud-Galusi, S. (2013). The contribution of morphology to the consistency of spelling-to-sound relations: A quantitative analysis based on French elementary school readers. *L'Année Psychologique* 113(1), 3-33.
- 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. Recherches en éducation*, (196), 49-66.
- Seymour, P. H., Aro, M., & Erskine, J. M. (2003). Foundation literacy acquisition in European orthographies. *Br J Psychol*, 94(Pt 2), 143-174.
- Shmidman, A., & Ehri, L. (2010). Embedded picture mnemonics to learn letters. *Scientific Studies of Reading*, 14(2), 159-182.
- Sprenger-Charolles, L., Desrochers, A., & Gentaz, É. (2018). Apprendre à lire-écrire en français. *Langue française*, N° 199(3), 51-67.
- Strouse, G. A., Nyhout, A., & Ganea, P. A. (2018). The Role of Book Features in Young Children's Transfer of Information from Picture Books to Real-World Contexts. *Frontiers in Psychology*, 9.
- Thévenin, M.G., Totereau, C., Fayol, M. & Jarousse, J.P. (1999) L'apprentissage/enseignement de la morphologie écrite du nombre en français. *Revue Française de Pédagogie*, n°126, 39-52.
- Ziegler, J. C. (2018). Différences inter-linguistiques dans l'apprentissage de la lecture. *Langue française*, N° 199(3), 35-49.
- Zorzi, M., Barbiero, C., Facoetti, A., Lonciari, I., Carrozzi, M., Montico, M., Bravar, L., George, F., Pech-Georgel, C., Ziegler, J. C. (2012). Extra-large letter spacing improves reading in dyslexia. *PNAS*, 109, 11455-11459.
- Wery, J. J., & Diliberto, J. A. (2016). The effect of a specialized dyslexia font, OpenDyslexic, on reading rate and accuracy. *Annals of dyslexia*, 1-14.



for more information :
www.reseau-canope.fr/csen