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Evidence, Myths and Teaching Practices: The Case of Teaching Reading in Italian Schools

Antonio Calvani [α], Paola Damiani [σ], Sergio Miranda [ρ], Lorena Montesano [ω] & Luciana Ventriglia[¥]

Summary- **Scientific research into the best methods of teaching reading agrees that all pupils can benefit from a rigorous phono-syllabic approach. Nevertheless, global or ideo-visual methods exert a strong appeal to teachers and maintain a wide prevalence in teaching practices, even where the language has a high transparency as in the case of Italian. This paper presents the results of an experiment conducted in Italy that shows the significant advantages for teaching reading deriving from the use of a phono-syllabic, progressive, explicit and systematic method. It underlines the need for institutional decision-makers and authors of school textbooks to take into account the evidence achieved by research and to avoid chasing methodologies superficially attractive but less effective, if not harmful, in such a significant field of early school education.**

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I. Introduction

As known, according to the classification introduced by the UNESCO Conference of 1951, the methods for reading have been divided into:

- Synthetic, to which the alphabetical method belongs, with the phonic versions (centred exclusively on the single sound) or phono syllabic (starting from the individual sounds to get to the syllables);
- Analytical, also called ideo-visual or global, which takes as a starting point the word, the phrase or the story;
- Analytical-synthetic, which, in varying degrees, starts from the whole word and then moves on to the analysis of the letters and vice versa.

The two basic methodologies (synthetic and analytical) are grounded on assumptions in stark contrast. The synthetic or alphabetical methods argue that oral language and reading follow different evolutionary paths: while oral language is a natural skill, a writing system is an artefact, a secondary code whose acquisition can only be achieved through a cognitive process consciously finalized. On the contrary, the global methods start from the premise that learning to speak and learning to read and write are two situations of the same type, laced in the continuum of a natural linguistic development.

Over the years, this old dispute has been dissolving; it has been recognized that it has historically been conditioned by ideological preconceptions of activism, that saw the global method as more congenial to its vision of the naturalness of learning. The groundlessness of the global method has already been demonstrated in the 90s by Liberman and Liberman (1990).

Numerous researches, generally in English-speaking contexts, have recognized that phonological awareness is the most important competence that interacts with the learning of reading, although some differences depend on the orthographic system of reference (Kamirloff-Smith, 1986; Morais, 1989; Goswami, Gombert, & Barrera, 1998).

Phonological awareness represents a sophisticated form of metalinguistic knowledge, the acquisition of which shows a hierarchical evolution, starting from the age of two years. Morais (1989) identifies two forms of it: global and analytical. The first one, typical of preschool age, refers to the operations of phonological reflection on the language to be carried out, above all, on the syllabic structure of the words; the second one is acquired with schooling and concerns the deep segmental structure of the language, the phonemes, allowing manipulations and classifications to operate on them.

Several meta-analyses have demonstrated that programs centred on Phonics Instruction (PI) or Phonemic awareness (PA) are much more effective for learning to read and write, compared with others that do not emphasize phonemic or phonological components, i.e., visual or global methods. The PI programs work well regardless of whether the teaching method is individual or not, with subjects of all backgrounds and socio-cultural levels, with subjects who are at risk of learning to read; they work all the better if the program is started before primary school, already in kindergarten (NRP, Ehri et al. 2001).

A further contribution has been added by neuroscience supported by brain imaging techniques. Dehaene (2009) added further confirmations categorically arguing that the old methodological

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question can be considered closed. "None should ignore the fact that some issues are definitively resolved. So today we know that global or ideo-visual methods do not work; all children of any social background benefit from explicit and earlier learning by learning the correspondences between letters and sounds of language. To return again to this point under the pretext of experimenting or exercising one's freedom of teaching would be criminal" (Dehaene, 2009, p. 381).

From this point of view, a language like Italian has many advantages. In fact, together with languages such as Finnish or German, Italian is characterized by greater transparency, that is, by a minimum discrepancy between the written code of words and their oral pronunciation (Ziegler, Stone, & Jacobs, 1997).

II. Teaching Reading to Children in Italian Schools

In the practices prevailing in Italy, is the advantage available to Italian really exploited? The institutional documents currently in force in Italy are concerned with ensuring that the adoption of textbooks is consistent with the three-year plan of the training offer and that the choices are an expression of the 'freedom of teaching and the professional autonomy of teachers' (Ministerial Note n. 3503 of 30.03.2016). The only constraint concerns the needs of students who manifest critical issues in the field of dyslexia, for which the global method is advised against (MIUR, 2011). Thus, publishing houses have full freedom to present "creative" approaches, lacking in any scientific reference. An analysis of the most popular school textbooks adopted in Italian schools (Calvani & Ventriglia, 2017) has highlighted, as their predominant traits:

- Complete or almost neglect of phonological awareness;
- Predominance of global and visual techniques: children are presented with a sentence, in which closed words are integrated with images and invited to "use images to understand";
- Reading environments overloading of distracting stimulations.

In recent years, some significant experimental research has been conducted in Italy, converging in the rejection of global and ideo-visual approaches. An interesting contribution came from the Institute for Educational Technologies of the CNR of Genoa (Midoro, Massarini, & Strisciuglio, 2017), which demonstrates how children can learn to read already from the age of three, without forcing, with an alphabetical approach conducted in a playful way. The assumption is that if children have these potentialities, it is illogical not to make use of them also taking into account that anticipating reading is of particular importance to prevent dyslexia. In another research, Padovani et al. (2018), the effectiveness of a syllabic approach was verified with first-grade pupils; 93 children of the experimental group (EG) employing the syllabic method were compared with 84 of the control group (CG) using common methods; the EG showed significantly better performance in all the parameters of speed and correctness, and also for writing, although the differences appeared less systematic.

III. The Alfabeto$_{140}$ Programme

Despite the evidence already acquired is such that it should induce the definitive rejection of global or ideo-visual approaches, it was decided to carry out wider research, for a better evaluation of the preferability and sustainability of a phono-syllabic approach conducted in a systematic way.

The ALFABETO$_{140}$ programme was set up starting from the materials of work and experiences conducted for many years in Italy by Luciana Ventriglia (2016). It was designed in 2019–20 and was experimented in the following year[1].

The characteristics of this programme can be summarized as follows. It is:

1) *Phonological:* Phonic, meta-phonological dimensions and grapheme–phoneme correspondence represent the central aspects;
2) *Syllabic:* Once the vowels have been acquired, the consonants are presented in association with the different vowels. The open syllable (CV)[2] is recognized as the basic reference, for example, BA, BE, BI, BO, BU, before the focus on the specific phoneme 'b':
3) *Generative:* Reading activities are expanded as much as possible to the given level of phonological difficulty. Thus, having acquired the ability to read CV, reading is extended to all types of compound forms (CVCVCV...)
4) *Structured:* It follows a precise order of difficulty, in accordance with the complexity of the phonotactic structure of sounds in Italian. The child is never presented with parts of words, words or phrases to read before they have already learned to decode them analytically; they are always made able to answer the requests for reading that are presented to them without being pushed to guess by chance;
5) *Explicit:* The program is divided into six consecutive units. Each unit is in turn divided into sessions whose average duration may vary, although normally this is about two hours. This structure

[1] It is estimated to take children a total of 140 hours of activity to read. The entire kit of materials of the program: Teacher's Guide, Child's Book, Additional Work Materials, Demonstration Videos, can be found in Italian at www.sapie.it/alfabeto.

[2] 'C' stands for consonant and 'V' for vowel.

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helps to control objectives, exercises and games typical of the specific phase. The children themselves are immediately shown what they must be able to do at the end of the unit, what the types of syllables or words are that they will be requested to master.

The teacher is made aware of the importance of the programme having to be accompanied by a sense of play, humour and passion. She must transmit to the students her own fun in the pronunciation of sounds, even strange or difficult, accompanied by emphasis, and gestures intentionally accentuated. She plays at making errors and asking the children to correct her mistakes.

IV. The Research Design

The design was quasi-experimental, that is with an experimental and a control sample, even if not chosen in a random way, organized by clusters (school classes). Seven universities collaborated (Aquila, Basilicata, Calabria, Roma Tre, Salerno, Torino and Udine); each university indicated one or more schools to which an invitation to collaborate was addressed. The schools that accepted were invited to select at least one experimental and one control class, eliminating classes that could be too dissimilar. For the choice of the Control group (CG), the chosen teaching method was evaluated through the textbook used: it was verified that in no case could the programme be recognized as a coherent phono-syllabic method. Twenty-three schools located in seven different regions participated, with 30 classes, for a total of 467 children for the Experimental group (EG), and 21 classes for a total of 325 children for the CG.

Pupils with certified intellectual disabilities, those with strong linguistic delays as they were not Italian-speaking, or pupils who already knew how to read, were eliminated from the sample. Teachers were asked to report pupils who, without being certified and without intellectual disabilities, presented some perceptive, phonic or phonological, graphic or praxis difficulties, and therefore were at risk of having difficulty in learning to read. The distribution of the sample between the regions, the class numbers and the relative details on the pupils are given in Table 1 and Table 2.

Table 1: Composition of EG.

Regions	Number of classes	Number of pupils	Certified or foreign students	Pupils who can already read	Reported pupils
BASILICATA	1	13	0	0	0
CALABRIA	5	77	1	0	6
CAMPANIA	6	113	17	0	9
PIEMONTE	2	27	4	0	2
ABRUZZO	8	97	1	5	9
LAZIO	7	122	5	5	31
FRIULI	1	18	6	0	5
TOTALE	30	467	34	10	62

Table 2: Composition of CG.

Regions	Number of classes	Number of pupils	Certified or foreign students	Pupils who can already read	Reported pupils
BASILICATA	1	10	0	0	0
CALABRIA	5	72	0	0	4
CAMPANIA	5	78	0	0	7
PIEMONTE	2	31	3	0	3
ABRUZZO	4	60	1	0	5
LAZIO	3	59	1	0	2
FRIULI	1	15	1	1	6
TOTALE	21	325	6	1	27

The experimental classes were provided with the work tools, the guide for the teacher, the child's book, the in-depth materials, the videos of the Alphabet$_{140}$ programme. The teachers of the experimental classes also participated in an initial presentation meeting, which were accompanied by four

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periodic meetings during the experimentation to discuss any critical issues and suggestions related to children with particular problems.

a) Assessment tools

At the beginning of October and in the first fortnight of May, respectively, the pre- and the post-tests were applied.

For the incoming evaluation two tests were used[3]:

- Visual recognition of letters (Battery PRCR-2, Cornoldi, Miato, Molin, & Poli, 2009), in which the child is asked to identify the letter equal to the model among four possible alternatives, some of which constitute different orientations of the same letter;
- Phonological awareness (MeTaFono IN, Miranda & Montesano, 2021), performed on the computer, in which the child is asked to indicate, among three possible alternatives, the image that begins or ends with a certain vowel.

For the outgoing evaluation three tests were used:

- Recognition of non-words (Lexical Decision – DLC of Caldarola, Perini, & Cornoldi, 2012). The pupil is asked to recognize non-words within a list of words and not words. The original test evidence has been adapted and reduced to 30 stimuli (13 words and 17 non-words);
- Dictation of words with increasing phonological complexity (Stella & Apolito, 2004). This test is generally regarded as the elective test for the early detection of dyslexia (Franceschi, Savelli, & Stella, 2011). To make it more discriminative, four more words signalling the transition from the alphabetic to the orthographic stage (Frith, 1985) have been added to the existing 16 words[4].
- Phonological awareness (MeTaFono OUT), a more complex variant of MeTaFono IN test (see Table 3).

Table 3: MeTaFono OUT. Test about the phonetic recognition of the initial letter, the final letter and the final syllable.

Initial vowel				
	Example	**Right choice**	**Distractor 1**	**Distractor 2**
Item 1	Elefante [Elephant]	Edera [Ivy]	Tigre [Tiger]	Isola [Island]
Item 2	Arcobaleno [Rainbow]	Agnello [Lamb]	Cielo [Sky]	Elicottero [Helicopter]
Item 3	Erba [Grass]	Elicottero [Helicopter]	Fiore [Flower]	Agnello [Lamb]
Final vowel				
	Example	**Right choice**	**Distractor 1**	**Distractor 2**
Item 4	Panino [Sandwich]	Toro [Bull]	Salame [Salami]	Pavone [Peacock]
Item 5	Mele [Apples]	Salame [Salami]	Pera [Pear]	Medusa [Jellyfish]
Item 6	Lupo [Wolf]	Nido [Nest]	Cane [Dog]	Lumaca [Snail]
Item 7	Luna [Moon]	Lumaca [Snail]	Sole [Sun]	Naso [Nose]
Item 8	Topi [Mice]	Birilli [Skittles]	Gatto [Cat]	Toro [Bull]
Final syllable				
	Example	**Right choice**	**Distractor 1**	**Distractor 2**
Item 9	Balena [Whale]	Befana [Befana]	Patata [Potato]	Fragola [Strawberry]
Item 10	Matita [Pencil]	Carota [Carrot]	Papera [Duck]	Cucina [Kitchen]
Item 11	Isola [Island]	Nuvola [Cloud]	Banana [Banana]	Edera [Grass]
Item 12	Vipera [Viper]	Papera [Duck]	Pirata [Pirate]	Oliva [Olive]

[3] A more detailed analysis of the tests and elaborations is reported in Calvani, Damiani, Montesano, Miranda, & Ventriglia, 2021.
[4] See Table 6: GHEPARDO (cheetah), MARGHERITA (daisy), MOSRINO (midge), CESPUGLIO (bush).

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In October, an Entry Questionnaire was administered to both the experimental and control teachers for the acquisition of class knowledge; in May, an Exit Questionnaire was administered to the experimental teachers to collect their evaluation and transferability of the method and programme.

V. Analysis of the Results

Before evaluating the possible effectiveness of the educational programme, it was necessary to verify that the scores obtained in the pre-test by the two groups were matched. The control group has an advantage in both tests; however, this difference is not statistically significant. The standardized average differences are less than 0.25 DS, as required by What Works Clearinghouse (2020)[5], so the two groups can be considered statistically balanced (see Table 4).

Table 4: Results obtained by the Experimental and Control Group at the pre-test.

	N		Experimental Group (Eg)	Control Group (Cg)	T	P	Standardized Average Differences
	EG	CG	M (DS)	M (DS)			
MeTaFono IN	394	244	11.24 (5.30)	11.97 (5.02)	-1,752	.080	0.14
Visual recognition of letters	407	287	9.98 (2.95)	0.05 (2.82)	-.304	.761	0.02

To evaluate the outcome at the end of the school year, the scores obtained by the EG and the CG in the exit tests were compared (see Table 5).

Table 5: Results obtained by the Experimental and Control Group at the post-test.

	N		Experimental Group (EG)	Control Group (CG)	t	p	Cohen's *d*
	EG	CG	M (DS)	M (DS)			
MeTaFono OUT	446	255	10.52 (2.11)	10.13 (2.25)	2.251	.025	0.18
Recognition of non-words	432	286	13.12 (5.53)	12.40 (5.19)	1,771	.077	0.13
Dictation of words	432	286	17.22 (4.16)	15.17 (5.57)	5.291	.000	0.43

To assess the effect size, we employed *Cohen's d-index*. As can be seen in Table 5, EG performs significantly better than CG in the phonological awareness test (10.52 vs 10.13, p=.025; ES d=0.18). Also, with regard to the recognition of non-words, a better performance is observed in EG, even if not reaching statistical significance (Tot. correct score 13.12 vs 12.40, p=.077 ES=0.13). Significantly more consistent differences emerge between the two groups in the dictation writing test (17.22 vs 15.17, p=.000; with an ES effect d = 0.43). Applying the parameters provided by the Education Endowment Foundation (Higgins et al., 2016, p.5) the first two values translated into time correspond to 2 months of advantage while the third value to 5 months.

a) Analysis of the results in the dictation test

If we dwell analytically on the dictation test, a simple look at the averages of the correct answers shows how the EG has always obtained superior performance in comparison with the CG in the writing of all words (p =.000) with differences that increase with the level of syllabic complexity (from words with only CV syllables to more complex words).

The Table 6 highlights the highest percentage of correctness achieved by the EG (85−90%; CG 71−80%) in writing words with a homosyllabic consonant group of the CCV or CCCV type and words with a heterosyllabic consonant group of the CVC type (EG 79−95%; CG 69−82%).

The percentage of correctness of the last four words dictated highlights that both the EG and the CG have a lower performance (EG 68 −78%; CG 50−69%). These words signal the transition to the orthographic phase, which involves a different processing strategy: it is necessary to translate the unique sound (GHE, SCE, GLI) into a plurality of graphic elements, of which it is necessary to remember the order. The percentage of correctness of the words in the dictation test highlights the incidence of the complexity of their phonotactic structure and justifies the attention of the ALPHABET programme towards consonant groups (Units 3 and 4) and towards orthographic groups (Unit 6).

[5] https://ies.ed.gov/ncee/wwc/Docs/referenceresources/WWC-Standards-Handbook-v4-1-508.pdf

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Table 6: Correct words: comparison between EG and CG.

	EG % correct answers	CG % correct answers
MELA [apple]	95%	89%
CORNA [horns]	89%	82%
NUMERO [number]	93%	86%
CARBONE [coal]	87%	76%
VELA [sail	93%	80%
TRAVE [beam]	90%	79%
CAVOLO [cabbage]	91%	82%
BAMBOLA [doll]	85%	72%
DONO [gift]	92%	85%
STRADA [road]	85%	71%
PAVONE [peacock]	85%	79%
SCATOLA [box]	90%	80%
BIRO [pen]	88%	78%
TRISTE [sad]	87%	76%
RIPOSO [rest]]	89%	82%
FANTASMA [ghost]	79%	69%
GHEPARDO [cheetah]	68%	50%
MARGHERITA [daisy]	70%	51%
MOSCERINO [gnat]	78%	68%
CESPUGLIO [bush]	67%	56%

b) Pupils at risk

Equally interesting are the results on pupils that can be defined as 'at risk' to see how effective the programme has been in their regard.

To identify these students, we used three criteria: the reports received from the teachers in the entry questionnaires, the low scores obtained at the initial tests of recognition of letters and phonological awareness, selecting pupils included in the lower quartile. Exit criterion was based on the dictation test: children whose score = < 14 are considered at risk of dyslexia. Table7, Table 8 and Table 9 show the data obtained.

Table 7: Children at risk reported by teachers.

	Initial evaluation	Final evaluation: Dictation test		
	Pupils reported by teachers	Average Dictation	Number of pupils with score <=14	% of the reference group
Experimental Group	40	16,30	7	18%
Control Group	12	9,75	8	67%
Total	52			

Table 8: Children at risk emerged in the initial recognition test.

	Initial evaluation	Final evaluation: Dictation test		
	Pupils in the Recognition test (score <=9)	Average Dictation	Number of pupils with score <=14	% of the reference group
Experimental Group	114	16,78	20	18%
Control Group	52	13,79	25	48%
Total	166			

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Table 9: Children at risk emerged in the MeTaFono IN test.

	Initial evaluation	Final evaluation: Dictation test		
	Pupils in the MeTaFono IN (score <=8)	Average Dictation	Number of pupils with score <=14	% of the reference group
Experimental Group	107	16,65	20	19%
Control Group	55	13,65	25	45%
Total	162			

As can be observed, using each of the criteria, the number of children at risk identified at the exit with a score below 14, always falls below 1/5 for the EG while it does not go below a range that oscillates between 45 and 67% for the CG.

c) The programme evaluated by the teachers

One of the most widespread criticisms of alphabetical or phono-syllabic approaches is that they are boring and demotivating. At the end of the experiment, to obtain further information on how their experience was lived by teachers and by children, a questionnaire including a rating scales (1–5) and open questions was addressed and completed by experimental teachers. Teachers were asked to evaluate the programme as a whole, its methodological guidance, its sustainability and re-applicability, the level of motivation and its effectiveness exercised on the classroom and on children with special needs (Figure 1) and, more specifically, the phono-syllabic method and its other main features: progressiveness, division in units, phonological modelling, assessment unit by unit (Figure 2).

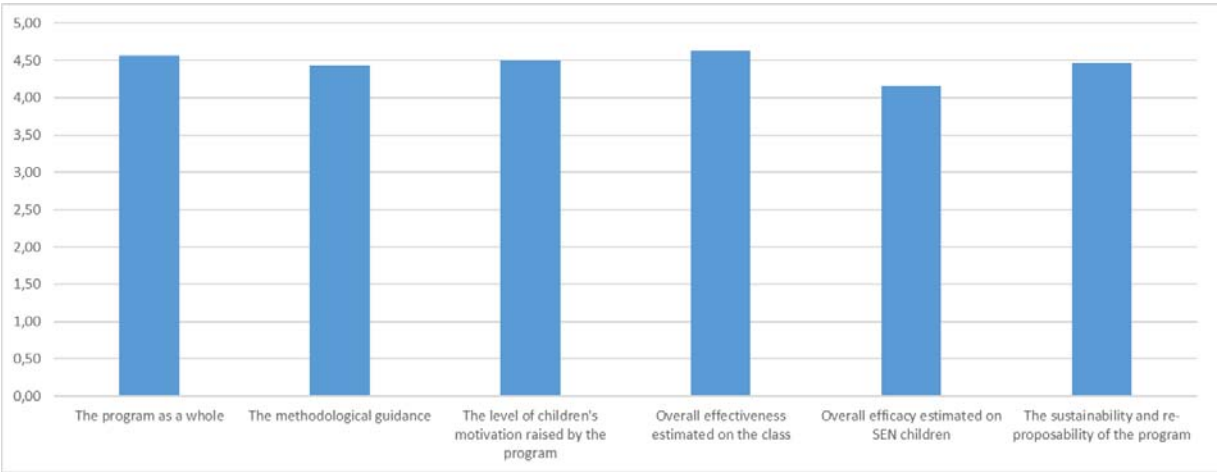

Figure 1: Teachers' evaluation of the quality of the programme.

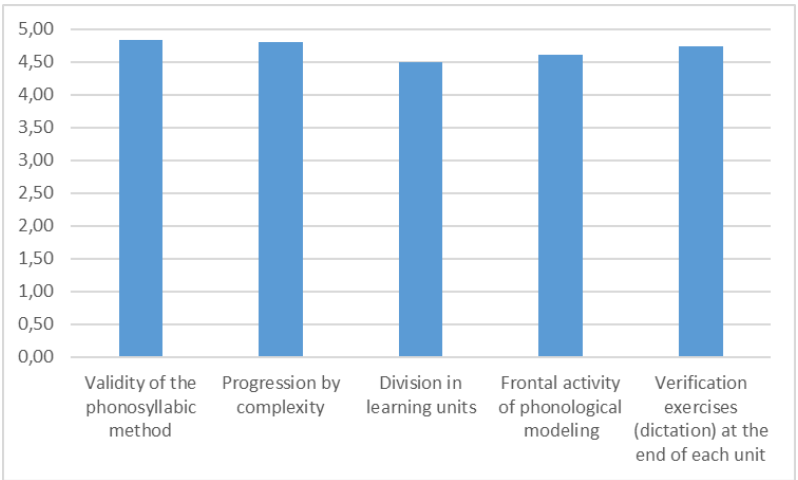

Figure 2: Teachers' evaluation of the phono-syllabic method and its specific features.

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As can be seen, the teacher satisfaction is generally very high, mostly with average values >4.5. With attributions between 4.7 and 4.83, the validity of the method, the estimated effectiveness on the class, the progressiveness of the method and the assessment of the achieved objects at the bottom of the units stand out.

The opinions formulated by open-ended questions were very positive, if not enthusiastic "[…] The programme proved to be of a high methodological level... The results obtained have been excellent... great interest and motivation in the students... satisfaction from families... well structured... very welcome to children ... effective and complete path... has fostered in the students a serene, playful and experiential approach to reading–writing".

Given the large size of this sample, this experimentation provides a further extended confirmation of what evidence-based research had already highlighted, namely that in transparent language, a method based on letter–sound correspondence, on syllabic decoding and phonological awareness is undoubtedly the more effective solution and more motivating for all children and not only for those at risk of dyslexia.

VI. Discussion and Conclusion

Scientific research into the best methods of teaching reading agrees that all pupils can benefit from a rigorous phono-syllabic approach. This work offered further experimental confirmation to this in a highly transparent language, such as Italian. The experiment applied on a large national sample has shown that a progressive, structured and explicit phono-syllabic teaching method, implemented in about 140 hours over the course of 7–8 months in the first primary, allows a significant advantage in phonological awareness, in the ability to distinguish words and non-words, and, above all, in writing under dictation: the students of the EG obtain superior results with an Effect Size between 0.2 and 0.43, a temporal advantage fluctuating from 2 months to 5 months.

Other important considerations are with regard to children at risk of dyslexia identified at the beginning through three criteria – one subjective (teacher reports) and two objective (scores in the lower quartile in the character recognition and phonological awareness test) – and evaluated in the dictation test at the exit. Children who at the end of the year manifest behaviours in the risk category are reduced on average to less than 1/5 in the EG, while they remain around half in the CG.

The enthusiasm on the part of the teachers who have experimented with the programme, with evaluations almost always higher than 4.5 (on a scale from 1 to 5) on the programme, on the motivation found in the pupils, on the method and its systematicity, are very promising in terms of the sustainability and transferability of this approach. It is therefore necessary to refute unfounded beliefs such as those for which alphabetical and phono-syllabic methods would be more boring and demotivating, or that children would prefer graphically more attractive texts: the pupils increase motivation when they realize progress in the learning because this increases their self-efficacy and, in the case of reading, discovering its internal mechanics is an exciting achievement for them.

These data are congruent both with international evidence, as well as with other experiments conducted in Italy in which syllabic-phonic approaches were used (Padovani et al., 2018), or in which current practices were integrated during the year by phonological laboratories (Franceschi, Savelli, & Stella, 2011).

As researchers, at this point we can only remind the decision-makers of their responsibilities. Science does not aim to dictate to education what it must do – and there is certainly no single way to teach reading. However, research can delimit the framework within which it is appropriate that teaching remains, as well as it can indicate, in some cases, inadequate interventions. And in the case of teaching to read: "Giving freedom of choice, where we know which is the preferable way, is a serious mistake. The school of freedom is not the one that lets choose [...] but the one that quickly teaches every child decoding – the only method that allows him to learn new words for himself" (Dehaene, 2009, p. 382).

There are no rational justifications, other than purely commercial ones, in support of the "creative" methods and textbooks that, without any scientific foundations, continue to proliferate and exert their negative influence in school practices.

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