

EasyReading™ as a compensating tool for readers with dyslexia:  
a comparison between Times New Roman and EasyReading™  
in good readers and dyslexic fourth grade children.<sup>1</sup>

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## **Abstract**

A number of books advertised as being particularly suitable for dyslexics can be found on the market today. Our research aimed at accessing the benefits of a specific reading font, EasyReading™, designed especially for dyslexics.

During the first phase of research eighty-nine primary and middle school pupils with reading difficulties were tested on their preference to EasyReading™.

In the second phase the performances of good readers and dyslexics were compared. In order to verify to what extent their reading performances were influenced by different typefaces, 533 fourth-grade primary school students were given reading tasks using two different fonts – the popular Times new Roman and EasyReading™. Once the results of the relative scores were collected, the students were divided into four groups according to their reading accuracy and fluency.

The results of the study were both statistically and clinically significant, demonstrating that EasyReading™ is a compensating tool for readers with dyslexia as well as a simplifying font for readers of all levels.

Keywords: dyslexia, EasyReading™, compensating tools, font.

## Introduction

Thanks to the Italian Law 170/2010 *New norms on Learning disabilities* and to the *Guidelines on education's rights for students with specific learning disabilities* (D.M. 5669 of July 12, 2011), the adoption of compensatory tools and dispensation measures has become, in Italy, an undeniable right for all students with Specific Learning Disorders (SLD). Since then, the education institutions have been required to integrate compensatory tools and dispensary measures into their education programs, and teachers have had to familiarise themselves with terms such as speech synthesis, digital spellcheckers, and personalized teaching plan.

Furthermore school books are now required to be available, not only in a hard version but also in a downloadable version (C.M. 18 of Feb. 9, 2012), in order for the font to be accessible in the size most suitable for each reader and, above all, to be readable out loud by a speech synthesis software. Even though Information Technology is widely recognised as an important reading aid, it cannot address all the problems that dyslexics face each time to deal with a written text (Bachmann, 2011).

Several publishers are specialising in suitable fonts for dyslexic people, and are publishing books specially designed for different aged audiences. Although it is important that texts are simple and suitable for dyslexics, the content must also be age appropriate, thus not putting readers off or making them feel inept. Having books that are interesting, age tailored and only differing in their font, can make reading enjoyable also for people with reading difficulties.

The publisher Angolo Manzoni created a specific font called EasyReading™, which thanks to its graphical high legibility can satisfy the special needs of dyslexic readers. EasyReading™ has a big size, a simple design, and also a special serif, to help dyslexic people distinguish between letters and numbers of similar shapes (d-b, p-q, 6-9). Letter and word spacing is wide, as well as line spacing, and the spacing between words and punctuation marks. The text has no hyphenated words, it is not justified and the line's interruption follows the natural reading flow. All these auxiliary aids, can be rightfully considered compensatory tools if they genuinely help to address the reading deficit and facilitate a more accurate and fluent performance.

Can reading really become easier by changing the font? The aim of this study is to answer this question by comparing reading performances obtained with the Times New Roman font, and the EasyReading™ one.

### *Why the EasyReading™ font?*

According to the EasyReading™ creators, this font is suitable for people with LD because "it has specific graphic features that make reading easier for dyslexic people". This statement, drawn from the Turin branch of the Italian Dyslexics Association (AID), was, until now, not scientifically supported.

In our clinical practice, we noticed that texts edited with the EasyReading™ font were extremely successful in helping children with dyslexia as well as children with reading problems not related to SLD (Specific Learning Disorder). Moving from these assumptions, the research focused on gathering children's opinions as to their preferences between the EasyReading™ font and the popular Times New Roman one.

## **The study**

During the first research phase, a questionnaire was given to primary and middle school students with Specific Learning Disabilities or reading difficulties, to collect their opinions on the EasyReading™ font (Bachmann et al., 2010). Students' preferences regarding legibility characteristics were assessed by asking them to compare the same text presented in two different fonts, namely the popular Times New Roman and the EasyReading™ font and with a consequent different length.

During the second research phase, the question of whether the preferences expressed towards EasyReading were also supported by an actual improvement in the accuracy or fluency of the reading performance was examined.

## **PHASE 1**

## Phase 1 – Method

### *Participants*

The 89 students taking part to the research were referred by their teachers to attend some special workshops, aimed to help them improve in their reading and writing skills. Out of these 89, 54 were primary school students (Grade III, IV and V) and 35 were middle school students (Grade I, II, III). Of these 54 primary school students 19 were female and 35 male, 23 were diagnosed with SLD (Specific Learning Disorder), while 31 students had no diagnosis, even though they had some learning difficulties. Of the 35 middle school students, 13 were females and 22 were males, 7 had a diagnosis of SLD, while 28 students had learning difficulties but no diagnosis (**TABLE 1**).

**TABLE 1 – Sample**

	Students with SLD diagnosis	Students without SLD diagnosis	Total
Primary School	23	31	54
Middle School	7	28	35

### *Procedure and tool*

A specific questionnaire was used to gather the student evaluations on the EasyReading™ font.

The questionnaire was composed of 2 sections:

- Section 1, included two items: the first made of two texts of the same length (one in EasyReading™ and one in Times New Roman) and the second made of the same two texts but with different length; for each item the students were required to choose the text they preferred most (in EasyReading™ or in Times New Roman);
- Section 2, included two items: one text in Times New Roman and one in EasyReading™, for each item the students were required to rate six different characteristics using a Likert scale. Possible answers ranged from “not at all agree” (0 points) to “very much agree” (4 points).

In Section 1, the first task (texts of the same length) asked the students to express which one of the two texts (the Times New Roman one or the EasyReading™ one) they would have preferred to read (**FIG. 1**). To make the two texts appear of the same length, the text in the EasyReading™ font, which is bigger in letters and line spacing, was shorter in words number, thus the two texts similarly filled a whole page.<sup>1</sup>

<sup>1</sup>The adopted texts are: EasyReading™ uses a page of a book with graphic settings “dedicated” to young dyslexic readers. Times New Roman uses the same text without any graphic adaptation.

Text A

– Né rovine né cose curiose? – rispose il fantasma, – voi avete la vostra Marina e le vostre maniere!

– Buona sera, andrò a chiedere a papà di dare ai gemelli una settimana di vacanza in più.

– Per favore, signorina Virginia, non ci vada! – gridò il fantasma. – Io sono così solo e infelice e davvero non so che fare. Vorrei mettermi a dormire e non posso.

– Questo è assurdo! Ha solo da andare a letto e soffiare sulla candela. Talvolta è molto difficile restare svegli, specialmente in chiesa; ma per il dormire non c'è alcuna difficoltà. Già, persino i neonati sanno come fare, e non sono molto intelligenti.

– Non dormo da trecento anni, – disse egli tristemente, e i begli occhi azzurri di Virginia si spalancarono per lo stupore. – Da trecento anni non dormo e sono tanto stanco.

Virginia si fece seria e le labbra le tremarono come petali di rosa. Gli si avvicinò e, inginocchiandosi accanto, ne guardò il vecchio volto raggrinzito.

– Povero, povero Fantasma! – mormorò lei. – Non ha un posto dove poter dormire?

– Ben oltre il bosco di pini, – rispose lui con bassa voce sognante, – c'è un piccolo giardino. Là l'erba cresce alta e forte, là fioriscono le grandi stelle bianche della cicuta, là l'usignolo canta per l'intera notte. Per l'intera notte canta e la fredda luna di cristallo guarda di lassù e il tasso protende le gigantesche braccia sopra chi dorme.

Text B

– Né rovine né cose curiose? – rispose il fantasma, – voi avete la vostra Marina e le vostre maniere!

– Buona sera, andrò a chiedere a papà di dare ai gemelli una settimana di vacanza in più.

– Per favore, signorina Virginia, non ci vada! – gridò il fantasma. – Io sono così solo e infelice e davvero non so che fare. Vorrei mettermi a dormire e non posso.

– Questo è assurdo! Ha solo da andare a letto e soffiare sulla candela. Talvolta è molto difficile restare svegli, specialmente in chiesa; ma per il dormire non c'è alcuna difficoltà. Già, persino i neonati sanno come fare, e non sono molto intelligenti.

**FIG. 1 – English translation**

**Text A:**

- No ruins no odd things? - Answered the ghost, - You have got your Marina and your manners!
- Good evening, I will ask dad to give the twins a week of holiday more.
- Please Madam Virginia, don't go! - Shouted the ghost. - I'm so lonely and unhappy and I don't really know what to do. I would like to sleep but I can't.
- This is ridiculous! You only have to go to bed and to blow out the candle. Sometimes it's really hard to stay awake, especially inside the church; but sleeping is so easy. Also babies know how to do that indeed, and they are not very smart.
- I don't sleep since three hundred years – he said sadly, and Virginia's beautiful eyes opened wide for the astonishment – I can't sleep since three hundred years and I am so tired. Virginia became serious and her lips trembled as rose's petals. She got closer and kneeling down to him, looked at his old and wrinkled face.
- Poor poor ghost! She whispered – Don't you have a place where to sleep?
- Far after the pine forest – he answered with a dreaming voice, - there is a little garden. Grass is high and strong, the big white stars of the hemlock bloom there, the nightingale sings all night long. For all night he sings and the crystal cold moon looks down from the sky and the badger lays his wide hands over the sleepers.

**Text B:**

- No ruins no odd things? – Answered the ghost, – You have got your Marina and your manners!
- Good evening, I will ask dad to give the twins a week of holiday more.
- Please Madam Virginia, don't go! – Shouted the ghost. – I'm so lonely and unhappy and I don't really know what to do. I would like to sleep but I can't.
- This is ridiculous! You only have to go to bed and to blow out the candle. Sometimes it's really hard to stay awake, especially inside the church; but sleeping is so easy. Also babies know how to do that indeed, and they are not very smart.



The second item (texts of different length) asked the student to choose, once again, which text they would have preferred to read between the Times New Roman one and the EasyReading™ one. In this occasion the previous adjustment was not made, thus the text in Times New Roman seemed to be shorter than the other, even though the number of words was the same (**FIG. 2**).

In Section 2, the students were asked to assess some features in both texts: the text in Times New Roman and the one in the EasyReading™ font (**FIG. 3**). They had to answer to a questionnaire (**FIG. 4**) and to express their level of agreement according to a Likert scale (not at all agree, not much agree, no opinion, somewhat agree and very much agree), regarding six characteristics of the font as follow:

1. Ease of reading
2. Visibility of the letters
3. Ease of tracking of the text
4. Punctuation visibility
5. Eye strain
6. Boredom of reading

Text A

— Né rovine né cose curiose? — rispose il fantasma, — voi avete la vostra Marina e le vostre maniere!

— Buona sera, andrò a chiedere a papà di dare ai gemelli una settimana di vacanza in più.

— Per favore, signorina Virginia, non ci vada! — gridò il fantasma. — Io sono così solo e infelice e davvero non so che fare. Vorrei mettermi a dormire e non posso.

— Questo è assurdo! Ha solo da andare a letto e soffiare sulla candela. Talvolta è molto difficile restare svegli, specialmente in chiesa; ma per il dormire non c'è alcuna difficoltà. Già, persino i neonati sanno come fare, e non sono molto intelligenti.

Text B

— Né rovine né cose curiose? — rispose il fantasma, — voi avete la vostra Marina e le vostre maniere!

— Buona sera, andrò a chiedere a papà di dare ai gemelli una settimana di vacanza in più.

— Per favore, signorina Virginia, non ci vada! — gridò il fantasma. — Io sono così solo e infelice e davvero non so che fare. Vorrei mettermi a dormire e non posso.

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- Non dormo da trecento anni, — disse egli tristemente, e i begli occhi azzurri di Virginia si spalancarono per lo stupore. — Da trecento anni non dormo e sono tanto stanco.
- Virginia si fece seria e le labbra le tremarono come petali di rosa. Gli si avvicinò e, inginocchiandosi accanto, ne guardò il vecchio volto raggrinzito.
- Povero, povero Fantasma! — mormorò lei. — Non ha un posto dove poter dormire?
- Ben oltre il bosco di pini, — rispose lui con bassa voce sognante, — c'è un piccolo giardino. Là l'erba cresce alta e forte, là fioriscono le grandi stelle bianche della cicuta, là l'usignolo canta per l'intera notte. Per l'intera notte canta e la fredda luna di cristallo guarda di lassù e il tasso protende le gigantesche braccia sopra chi dorme.

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- Questo è assurdo! Ha solo da andare a letto e soffiare sulla candela. Talvolta è molto difficile restare svegli, specialmente in chiesa; ma per il dormire non c'è alcuna difficoltà. Già, persino i neonati sanno come fare, e non sono molto intelligenti.

**Fig. 4 – Text assessment questionnaire – In Italian**

**ADESSO OSSERVA QUESTO TESTO E RISPONDI ALLE DOMANDE:**

**È FACILE DA LEGGERE?**

PER NIENTE	POCO	NÈ SI NÈ NO	MOLTO	MOLTISSIMO
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**SI VEDONO BENE LE LETTERE?**

PER NIENTE	POCO	NÈ SI NÈ NO	MOLTO	MOLTISSIMO
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**SI TIENE BENE IL SEGNO?**

PER NIENTE	POCO	NÈ SI NÈ NO	MOLTO	MOLTISSIMO
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**SI VEDE BENE LA PUNTEGGIATURA?**

PER NIENTE	POCO	NÈ SI NÈ NO	MOLTO	MOLTISSIMO
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**SI STANCA LA VISTA?**

PER NIENTE	POCO	NÈ SI NÈ NO	MOLTO	MOLTISSIMO
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**È NOIOSO DA LEGGERE?**

PER NIENTE	POCO	NÈ SI NÈ NO	MOLTO	MOLTISSIMO
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**Fig.4 – Text assessment questionnaire – English translation**

**NOW LOOK AT THE TEXT AND ANSWER TO THE FOLLOWING QUESTIONS:**

**IS IT EASY TO READ?**

NOT AT ALL	NOT MUCH	NO OPINION	SOMEWHAT	VERY MUCH
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**ARE LETTERS CLEAR?**

NOT AT ALL	NOT MUCH	NO OPINION	SOMEWHAT	VERY MUCH
------------	----------	------------	----------	-----------

**CAN YOU KEEP THE TRACK EASILY?**

NOT AT ALL	NOT MUCH	NO OPINION	SOMEWHAT	VERY MUCH
------------	----------	------------	----------	-----------

**IS THE PUNCTUATION CLEAR?**

NOT AT ALL	NOT MUCH	NO OPINION	SOMEWHAT	VERY MUCH
------------	----------	------------	----------	-----------

**DOES IT MAKE YOUR EYES STRAIN?**

NOT AT ALL	NOT MUCH	NO OPINION	SOMEWHAT	VERY MUCH
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**IS IT BORING TO READ?**

NOT AT ALL	NOT MUCH	NO OPINION	SOMEWHAT	VERY MUCH
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### Scoring

The scores obtained in the second section were summed up in order to have an overall appraisal of each font. Few items were inverted to have better evaluations associated with highest scores. Consequently two main final scores resulted:

- EasyReading™ score (sum of the scores assessing the EasyReading™ characteristics);
- Times New Roman score (sum of the scores assessing the Times New Roman characteristics).

Since there was no significant difference between the scores obtained from the students with SLD and the undiagnosed ones, their scores were considered together (for the primary school students,  $t_{(52)}=0.42$ , n.s.; for the middle school students,  $t_{(33)}=0.89$ , n.s., see **(TABLE 2)**).

**TABLE 2 – EasyReading™ and Times New Roman’s characteristics evaluation in Primary and Middle School students (Section 2)**

<b>Primary School</b>		
	Evaluation of the text in EasyReading™	Evaluation of the text in Times New Roman
Without SLD diagnosis	14.60±2.83	11.52±3.40
With SLD diagnosis	13.70±3.67	10.83±3.93
<b>Middle School</b>		
	Evaluation of the text in EasyReading™	Evaluation of the text in Times New Roman
Without SLD diagnosis	15.75±3.36	10.00±4.81
With SLD diagnosis	17.00±3.16	11.29±4.89

## Phase 1 – Results

In the first task of Section 1, where the length of the texts seemed to be the same, EasyReading™ was chosen in 56% of cases by primary school students and in 77.1% of cases by middle school students.

On the contrary, when the two texts appeared to be of different lengths (task 2, Section 1)

EasyReading™ was chosen by primary school students in 51.9% of the cases and by middle school students in 54.3% of cases. This result showed how the length of the text strongly influenced the students' choice, even though the EasyReading™ text was always the most preferred one (TABLE 3).

**TABLE 3 – Preferences toward the EasyReading™ font in Section 1  
(task 1: same length, task 2: different length)**

	Primary School	Middle School
Same length	56.0%	77.1%
Different length	51.9%	54.3%

In Section 2, scores were again in favor of the EasyReading™ font (a statistically significant difference), for both the primary and the middle school students. Primary school students overall got a score of 11.22±3.61 for the Times New Roman font, and of 13.91±3.19 for the EasyReading™ one ( $M=2.69\pm3.98$ ,  $t_{(53)}=4.95$ ,  $p<0.001$ ). Middle school students confirmed this trend by scoring 10.26±4.79 for Times New Roman and 16.00±3.32 ( $M=5.74\pm5.61$ ,  $t_{(34)}=6.05$ ,  $p<0.001$ ) for EasyReading™. In particular, EasyReading™ was preferred by primary school students for its reading ease ( $M=2.80\pm1.14$ ,  $t_{(53)}=3.85$ ,  $p<0.001$ ), visibility of the letters ( $M=2.83\pm1.21$ ,  $t_{(53)}=5.13$ ,  $p<0.001$ ), ease of tracking of the text ( $M=2.89\pm0.79$ ,  $t_{(53)}=6.73$ ,  $p<0.001$ ), punctuation visibility ( $M=2.54\pm1.27$ ,  $t_{(53)}=5.57$ ,  $p<0.001$ ) and for being less boring to read ( $M=1.83\pm1.60$ ,  $t_{(53)}=-4.52$ ,  $p<0.001$ ) (TABLE 4).

**TABLE 4 – Fonts' characteristics evaluation in Primary School students  
(total and relative scores)**

	Ease of reading*	Letters visibility*	Ease of tracking of the text*	Punctuation visibility	Eye strain*	Boredom of reading*	Total scores*
Times New Roman	1.98±1.16	1.81±1.15	1.85±1.12	2.26±1.53	1.48±1.25	1.83±1.60	11.22±3.61
Easy Reading	2.80±1.14	2.83±1.21	2.89±0.79	1.96±1.68	2.54±1.27	0.89±1.40	13.91±3.19

\*statistically significant differences,  $p<0.001$

Middle school students similarly preferred the EasyReading™ font for its reading ease ( $M=2.97\pm0.86$ ,  $t_{(34)}=5.39$ ,  $p<0.001$ ), visibility of the letters ( $M=3.06\pm0.94$ ,  $t_{(34)}=9.19$ ,  $p<0.001$ ), ease of tracking of the

text ( $M=2.91\pm0.92$ ,  $t_{(34)}=2.14$ ,  $p<0.001$ ) and punctuation visibility ( $M=2.74\pm1.07$ ,  $t_{(34)}=5.60$ ,  $p<0.001$ ) (TABLE 5).

**TABLE 5 – Fonts’ characteristics evaluation in Middle School students  
(total and relative scores)**

	Ease of reading*	Letters visibility*	Ease of tracking of the text*	Punctuation visibility	Eye strain*	Boredom of reading	Total scores*
<b>Times New Roman</b>	1.63±1.19	1.29±0.93	1.26±1.20	2.20±1.16	1.43±0.95	2.46±1.20	10,26±4,79
<b>Easy Reading</b>	2.97±0.86	3.06±0.94	2.91±0.92	1.94±1.80	2.74±1.07	2.37±1.55	16,00±3,32

\*statistically significant differences,  $p<0.001$

No significant difference was found between the evaluations of the students with SLD and the students with reading difficulties but no diagnosis. EasyReading™ obtained better evaluations from both these categories of students, showing that it should be advised to people with SLD and with unspecific reading difficulties.

## **PHASE 2**



## Phase 2 – Method

Are readers' preferences enough to state that the EasyReading™ font is effective for dyslexia?

In order to answer this question, the study moved its focus from the students' opinions to their performances. The Phase 2 aimed to verify if the preferences were supported by an actual improvement in the reading performances, assessed as reading fluency and/or accuracy, in both dyslexic and normal readers.

### *Sample group selection*

Sixteen primary schools, belonging to 7 educational institutes of Prato's province, participated in the study. A total of 664 fourth-grade primary school students (364 males and 300 females) were recruited, of which 107 were foreign students. The final sample was of 533 children, because some of them were excluded: 12 children did not have their parents consent, a class of 20 children dropped out while the study was ongoing; 33 foreign children living in Italy since less than two years, which had too poor knowledge of the language; 57 children were absent on the test days and some children could not participate because impaired (Italian Disability Law 104/92).

### *Sample group characteristics*

The sample group who took part in the tests was composed of 533 fourth-grade students, 282 were males and 251 were females. The average age was 9.5 years (average expressed in months: 115±4). The ethnicities of the children were 456 children Italian and 21 Chinese (out of the 73 foreign students), which is the most considerable foreign community in the research project area.

### *Tools*

To pinpoint the suspected cases of dyslexia, we used an excerpt from the *MT reading test* (Cornoldi and Colpo, 1981; 1995), the word and non-word tasks derived from the *DDE-2 battery* (Sartori, Job and Tressoldi, 2007), and the *Raven CPM colored progressive matrices* (Raven 1998).

In the excerpt reading test, performances were considered below norm if they fell in the Requires Attention range (R.A.) for accuracy or if they ranged between 1 and 2 standard deviations below average for fluency. Performances were considered deficit if they fell in the Requires Immediate Intervention (R.I.I.) for accuracy or ranged more than 2 standard deviations below average for fluency.

In the word and non-word reading tasks, performances were considered below the norm if they were between 1 and 2 standard deviations below the average for fluency or below the 15th percentile for reading accuracy. While, performances were considered deficit, if they were more than 2 standard de-

viations below the average for fluency, or below the 5th percentile for reading accuracy.

In the *CPM colored progressive matrices*, performances higher than the 25th percentile were considered within the norm and the performances equal or lower than the 25th percentile were considered below normal.

**All reading tests (excerpt, lists of word and non-word) were used in the original version (MT and DDE-2) and in a modified version, specially prepared for this study, in which the original Times New Roman font was replaced by the EasyReading™ font. Not to create further elements of diversity, the number of syllables per line, the graphic layout and the character size were kept the same among all tests. The only aspects that differed were the peculiar ones of the EasyReading™ font, such as the line spacing, the letter spacing and the lack of serifs.<sup>1</sup>**

### *Procedure*

Each child took part in three sessions; the reading tests were undertaken during the first and second sessions, and the Raven CPM matrices during the third.

The reading tests were given in two different orders, while the Raven CPM matrices were always administered at the end:

- 1<sup>^</sup> order: excerpt in the original font, word and non-word reading tasks in the original font, excerpt in the EasyReading™ font, word and non-word reading tasks in the EasyReading™ font, CPM;
- 2<sup>^</sup> order: excerpt in the EasyReading™ font, word and non-word reading tasks in the EasyReading™ font, excerpt in the original font, word and non-word reading tasks in the original font, CPM.

All tests were undertaken individually and administered by psychologists.

For the MT excerpt reading test we referred to the new norms of Cornoldi, Tressoldi and Perini (2010), to the latest manual edition (2007) for the word and non-word reading tasks derived from DDE-2 test and to the Italian normative data manual (Belacchi et al., 2008) for the Raven CPM matrices.

### *Sample group description*

The sample was divided into four groups according to the points scored at the original version of the MT and at the DDE-2 reading test, as following:

- group 0 (normal readers): scores above the 25th percentile at the CPM and average scores in the reading test;

<sup>1</sup>The images of reading tests are not published being them copyrighted.

- group 1 (reading difficulties): scores above the 25th percentile at the CPM and reading skills performances below average (fluency between 1 and 2 standard deviation below average and/or accuracy between 15th and 5th percentile);
- group 2 (dyslexia: students already diagnosed with dyslexia or pinpointed as dyslexic during the testing): scores above the 25th percentile in the CPM and two or more deficit performances in the reading test (fluency more than 2 standard deviation below average and/or accuracy below the 5th percentile);
- group 3 (CPM below average): scores below or equal to the 25th percentile in the CPM test.

According to these criteria, 426 children had no reading problems (group 0, normal readers), 27 children had some difficulties in reading (group 1), 54 children were dyslexic (group 2), and 26 children which required further investigations on their intellectual functioning (group 3) (TABLE 6).

**TABLE 6 – Division of the sample into 4 groups**

Group 0 (normal readers)	Group 1 (reading difficulties)	Group 2 (dyslexia)	Group 3 (CPM below 25th percentile)	Totals
426	27	54	26	533

## Phase 2 - Results

Average and standard deviation scores were collected on the overall sample and on each single group. The order effect was not considered in the final scoring as it was not statistically significant.

According to the MT test ranges, four different categories emerged: Fully Achieved Criteria (C.P.R), Sufficient Performance (P.S.), Attention Required (R.A.) and Immediate Intervention Required (R.I.I).

Students with difficulties in reading were 1.3%, when the reading text was presented in the original font, and dropped to 0.2% when it was submitted in the EasyReading™ version (TABLE 7). In fact 20 children scored below average in the reading fluency performance when the text was presented in Times New Roman: 13 below average within 2 standard deviations (Attention Required range) and 7 in the clinical range, below 2 standard deviation from average (Immediate Intervention Required range). Only 8 scored below average in the same performance when the text was in the EasyReading™ font (7 within 2 standard deviations e 1 below 2 standard deviations).

**TABLE 7 – Reading fluency ranges according to the MT manual**

Version	C.P.R. Fully Achieved Criteria	P.S. Sufficient Performance	R.A. Attention Required	R.I.I. Immediate Intervention Required
<b>Times New Roman</b>	235	278	13	7
<b>EasyReading™</b>	363	162	7	1

The EasyReading™ outlet had an important influence also on the reading accuracy, while the students in the clinical range (Immediate Intervention Required range) were 12 in the original text, they subsided to 9 in the EasyReading™ version (TABLE 8).

**TABLE 8 – Reading accuracy ranges according to the MT manual**

Version	C.P.R. Fully Achieved Criteria	P.S. Sufficient Performance	R.A. Attention Required	R.I.I. Immediate Intervention Required
<b>Times New Roman</b>	308	172	41	12
<b>EasyReading™</b>	271	208	45	9

Furthermore, of the 54 children with a diagnosis of dyslexia (10.1% of the total students), only 27 (5.1% of the total) still fulfilled the criteria for dyslexia when the assessment was made by using the EasyReading™ font (TABLE 9).

**TABLE 9 – Students in the clinical range for dyslexia**

Version	Frequencies	Percentages
<b>Times New Roman</b>	54	10.1%
<b>EasyReading™</b>	27	5.1%

Hereafter, reading fluency (syllables per second) and accuracy were compared in the performances obtained with the original Times New Roman version and with the EasyReading™ one. In the EasyReading™ version, the average fluency was 4.16 syllables per second with a standard deviation of 1.09, while in the Times New Roman version it was 3.50 syllables per second with a standard deviation of 0.94 (statistically significant difference,  $t_{(531)}=-32.12$ ,  $p<0.001$ ).

A similar significant difference was also found when comparing the performances in the word and non-word reading tasks: in the word task the average reading fluency was 3.03 in the original version and went up to 3.33 ( $t_{(532)}=-18.14$ ,  $p<0.001$ ) in the EasyReading™ one, while in the non-word task it increased from 1.86 to 2.04 ( $t_{(532)}=-10.37$ ,  $p<0.001$ ) (**TABLE 10**).

**TABLE 10 – Reading fluency (syllables per second) in the reading tests**

Reading task	Times New Roman	EasyReading™
Excerpt ( $t_{(531)}=-32.12$ , $p<0.001$ )	3.50±0.94 P.S. Sufficient Performance	4.16±1.09 C.P.R. Fully Achieved Criteria
Words ( $t_{(532)}=-18.14$ , $p<0.001$ )	3.03±0.88	3.33±0.93
Non-words ( $t_{(532)}=-10.37$ , $p<0.001$ )	1.86±0.60	2.04±0.61

Accuracy significantly improved in the word and non-word tasks, but not in the reading excerpt. In the word task students' mistakes from 5.49 on average in the original format, decrease to 4.14 ( $t_{(532)}=9.56$ ,  $p<0.001$ ) in the EasyReading™ format, while in the non-word task mistakes reduced from 7.72 to 6.49 ( $t_{(532)}=8.41$ ,  $p<0.001$ ) (**TABLE 11**).

**TABLE 11 – Reading accuracy (errors) in the reading tests**

Reading task	Times New Roman	EasyReading™
Excerpt ( $t_{(532)}=-2.62$ , $p<0.001$ )	3.10±2.75 P.S. Sufficient Performance	3.34±2.90 P.S. Sufficient Performance
Words ( $t_{(532)}=9.56$ , $p<0.001$ )	5.49±5.32	4.14±4.55
Non-words ( $t_{(532)}=8.41$ , $p<0.001$ )	7.72±5.30	6.49±4.67

Reading fluency significantly improved within all groups when the text was presented in the EasyReading™ version. Focusing on each group it is possible to notice that normal readers had an average reading fluency of 3.73 syllables per second, falling in the Full Achieved Criteria range performance. Dyslexics read at an average fluency of 2.67 syllables per second, with a performance in the Sufficient Performance range. Children with reading difficulties read at an average fluency of 2.39 syllables per second, and had a performance in the Sufficient Performance range too. Finally, students with low CPM (*colored progressive matrices*) scored 2.63 syllables per second on average, which made them as well to be part of the Sufficient Performance range performance.

In the EasyReading™ version normal readers scored 4.44 in the reading fluency (syllables per second), an improvement of 0.71 syllables per second ( $t_{(428)}=-30.52, p<0.001$ ). Dyslexics read 3.19 syllables per second, gaining 0.52 syllables per second ( $t_{(53)}=-8.64, p<0.001$ ). Children with reading difficulties increased their fluency of 0.51 syllables per second ( $t_{(26)}=-6.82, p<0.001$ ) reading 2.90 syllables per second. Finally students with low CPM gained 0.36 syllables per second ( $t_{(25)}=-4.77, p<0.001$ ) as they read 2.99 syllables per second (TABLE 12).

**TABLE 12 – Reading fluency (syllables per second) among all groups in the excerpt**

Group	Times New Roman	EasyReading™
Group 0 – Normal readers ( $t_{(428)}=-30.52, p<0.001$ )	3.73±0.80 C.P.R.	4.44±0.92 C.P.R.
Group 1 – Reading difficulties ( $t_{(26)}=-6.82, p<0.001$ )	2.39±0.54 P.S. Sufficient Performance	2.90±0.75 P.S. Sufficient Performance
Group 2 – Dyslexics ( $t_{(53)}=-8.64, p<0.001$ )	2.67±0.92 P.S. Sufficient Performance	3.19±1.13 P.S. Sufficient Performance
Group 3 – CPM below 25th percentile ( $t_{(25)}=-4.77, p<0.001$ )	2.63±1.08 P.S. Sufficient Performance	2.99±1.14 P.S. Sufficient Performance

In the EasyReading™ version reading accuracy significantly improved for the dyslexic group, where errors reduced from 6.59 to 6.25 ( $t_{(425)}=-3.43, p<0.001$ ) and for the one with reading difficulties, whose mistakes from 5.83 went down to 5.50 ( $t_{(26)}=0.74, p<0.001$ ), while it got worse for the other two groups (TABLE 13).

**TABLE 13 – Reading accuracy (errors) among all groups in the excerpt**

Group	Times New Roman	EasyReading™
Group 0 – Normal readers ( $t_{(425)}=-3.43, p<0.001$ )	2.27±1.64	2.58±1.96
Group 1 – Reading difficulties ( $t_{(26)}=0.74, p<0.001$ )	5.83±2.57	5.50±2.57
Group 2 – Dyslexics ( $t_{(425)}=-3.43, p<0.001$ )	6.59±3.97	6.25±3.61
Group 3 – CPM below 25th percentile ( $t_{(25)}=-1.33, p<0.001$ )	6.60±4.06	7.50±5.27

In regard to the word and non-word tasks (DDE-2 test), the research focused only on normal readers and dyslexics and refers to the tables for data related to other groups. In the list of word, dyslexic children significantly improved their reading fluency in the EasyReading™ version, compared to the original one, increasing from 2.19 syllables per second to 2.39 ( $t_{(53)}=-6.34$ ,  $p<0.001$ ), as well as normal readers, which read the original version in 3.26 syllables per second and the EasyReading™ version in 3.57 ( $t_{(425)}=-16.37$ ,  $p<0.001$ ) (TABLE 14).

**TABLE 14 – Reading fluency (syllables per second) among all groups in the list of words**

Group	Times New Roman	EasyReading™
Group 0 – Normal readers ( $t_{(425)}=-16.37$ , $p<0.001$ )	3.26±0.74	3.57±0.79
Group 1 – Reading difficulties ( $t_{(26)}=-6.68$ , $p<0.001$ )	2.27±0.60	1.55±1.24
Group 2 – Dyslexics ( $t_{(53)}=-6.34$ , $p<0.001$ )	2.19±0.81	2.39±0.83
Group 3 - CPM below 25th percentile ( $t_{(25)}=-2.65$ , $p<0.001$ )	2.11±0.93	2.26±0.83

Accuracy improved as well for both groups in the EasyReading™, in fact reading mistakes reduced from 13.35 in the original version for dyslexics, to 9.93 in the EasyReading™ one ( $t_{(53)}=4.94$ ,  $p<0.001$ ) and for normal readers from 3.68 to 2.78 ( $t_{(425)}=7.22$ ,  $p<0.001$ ) (TABLE 15). A similar trend was found also in the list of non-word, where reading fluency as well as accuracy improved for both groups in the EasyReading™ version.

**TABLE 15 – Reading accuracy (errors) among all groups in the list of words**

Group	Times New Roman	EasyReading™
Group 0 – Normal readers ( $t_{(425)}=7.22$ , $p<0.001$ )	3.68±3.25	2.78±3.01
Group 1 – Reading difficulties ( $t_{(26)}=-2.36$ , $p<0.001$ )	9.26±4.25	7.22±5.03
Group 2 – Dyslexics ( $t_{(53)}=4.94$ , $p<0.001$ )	13.35±5.40	9.93±5.67
Group 3 – CPM below 25th percentile ( $t_{(25)}=4.33$ , $p<0.001$ )	14.88±6.77	11.19±5.18

Dyslexic children read 1.42 syllables for second the text in the Times New Roman font and at 1.58 syllables for second the EasyReading™ one, with an improvement of 0.16 syllables per second ( $t_{(53)}=-4.84$ ,  $p<0.001$ ), while normal readers read the first one at 1.96 syllables for second and the second at 2.16, therefore improving of 0.20 second in the EasyReading™ version ( $t_{(425)}=-13.16$ ,  $p<0.001$ ) (TABLE 16).

**TABLE 16 – Reading fluency (syllables per second) among all groups in the list of non-words**

Group	Times New Roman	EasyReading™
Group 0 – Normal readers ( $t_{(425)}=-13.16$ , $p<0.001$ )	1.96±0.50	2.16±0.56
Group 1 – Reading difficulties ( $t_{(26)}=0.31$ , $p<0.001$ )	1.55±1.24	1.48±0.44
Group 2 – Dyslexics ( $t_{(53)}=-4.84$ , $p<0.001$ )	1.42±0.49	1.58±0.53
Group 3 – CPM below 25th percentile ( $t_{(25)}=-2.39$ , $p<0.001$ )	1.42±0.59	1.53±0.60

Also in term of accuracy, reading mistakes decreased from 14.22 to 10.61 for dyslexic readers ( $t_{(53)}=15.30$ ,  $p<0.001$ ) and from 6.31 to 5.50 for normal readers ( $t_{(425)}=-5.74$ ,  $p<0.001$ ) (TABLE 17).

**TABLE 17 – Reading accuracy (errors) among all groups in the list of non-words**

Group	Times New Roman	EasyReading™
Group 0 – Normal readers ( $t_{(425)}=-5.74$ , $p<0.001$ )	6.31±4.19	5.50±3.94
Group 1 – Reading difficulties ( $t_{(26)}=1.94$ , $p<0.001$ )	10.26±3.91	8.67±4.64
Group 2 – Dyslexics ( $t_{(53)}=15.30$ , $p<0.001$ )	14.22±5.71	10.61±5.39
Group 3 – CPM below 25th percentile ( $t_{(25)}=3.69$ , $p<0.001$ )	14.73±5.51	11.85±5.27



## Conclusions

Results show a statistically relevant difference between performances undertaken with the EasyReading™ font as opposed to Times New Roman. The EasyReading™ font proved to have positive impact on reading fluency across all reading tests (excerpts, words and non-words).

Dyslexic children scored significantly better in reading accuracy with EasyReading™. Consequently, the EasyReading™ format was not only preferred by most of the students (phase 1 of the present research), but also helped to improve their reading performances (phase 2).

The improvement in reading fluency (syllables per second) when using the EasyReading™ font, is statistically and clinically significant - an improvement of 0.16 in reading fluency in non-words and of 0.52 in excerpts, surpassing the natural, annual improvement. Longitudinal studies show that over the period of a year dyslexics demonstrate an improvement of 0.30 syllables per second in excerpts and 0.14 in non-words (Stella, Faggella e Tressoldi, 2001; Tressoldi, Stella e Faggella, 2001), a notably weaker result than with EasyReading™.

These results point to several conclusions:

First, students read more readily with EasyReading™ as seen by their improved reading fluency and accuracy. This would indicate that EasyReading™ is preferable to Times New Roman for reading tasks. Teachers can facilitate reading for normal and dyslexic readers by simply changing fonts when preparing exams or texts for their students.

Secondly, the consistent clinical improvement that results from using EasyReading™ exceeds the natural, annual reading improvement of dyslexic students, thus verifying that EasyReading™ makes reading easier. This allows dyslexic students to partially fill the gap between their reading fluency and that of their classmates by simply using this font.

Third, the dyslexic sample considered in the research was 10.1% of the total number of considered students; double that of epidemiological studies. It should be noted that this latter study, aimed at assessing students with specific reading disabilities, is less precise or accurate as a dyslexia diagnosis than the one used in this present study. In fact, the present study requires a more complex and accurate clinical assessment, considers not only inclusion criteria but also exclusion criteria, as recommended by the Consensus Conferences of the Italian Dislexia Association (AID) (2007; 2011) and by the Consensus Conference of the Italian Health Institute (ISS, Istituto Superiore di Sanità, 2011).

It was not possible in the present research to assess IQs with a multi-component test or to investigate exclusion factors. However, students with less than two years of schooling and children with a poor knowledge of Italian or a lack of education were excluded. In so doing, the possibility for the tests to be influenced by cognitive or sensorial impairments was decreased. In addition, setting the cut-off of the Raven Matrix above the 25th percentile helped to rule out children with under-diagnosed cognitive deficits. Unfortunately, it was not possible to exclude the influence of emotional, social or cultural problems, which could have affected student performances. Regardless of the above considerations, it remains imperative to investigate why so many students failed the reading tests, as it is unlikely that they were dyslexics.

Finally, as reading fluency and accuracy improvements were appreciable across all groups (normal readers, readers with difficulties, dyslexics and students with cognitive difficulties), EasyReading™ merits being considered an important aid of all students. As highlighted by Allamandri and colleagues (Allamandri et al., 2007), further investigation into factors positively or negatively involved in the reading decoding, for example spatial attention (Facoetti et al. 2003; 2006) or a particular font's features such as letter spacing, is essential. For this reason the present research is continuing to further examine some of these aspects. A study is now underway to assess the effect of letter spacing by comparing reading performances of a text in EasyReading™ and in an expanded (with wider letter spacing) version of Times New Roman. This current study is focused on fourth and fifth grade primary school students and the data will be published shortly.

Based on the evidence collected and the consistent results, it can be concluded that the EasyReading™ font facilitates reading for both normal and dyslexic readers and can rightfully be considered a very effective compensating tool for dyslexia and a facilitating font for all readers.

## References

- ALLAMANDRI V., BRENBATI F., DONINI R., IOZZINO R., RICCARDI RIPAMONTI I., VIO C., MATTIUZZO T. E TRESSOLDI P. (2007), *Trattamento della dislessia evolutiva: un confronto multicentrico di efficacia ed efficienza*, «Dislessia», Vol. 4, n. 2, pp.143-162.
- BACHMANN C. (2011), Oltre la legge 170/2010: didattica personalizzata e compiti a casa di alunni con DSA, «Psicologia e Scuola», Novembre-Dicembre 2011.
- BACHMANN C., PELAGALLI P., GUGLIELMINI G., PISCITELLI C. E LASAGNI A. (2010). *Risultati di un'indagine sulle caratteristiche di leggibilità del carattere EasyReading™ in alunni dislessici della scuola primaria e secondaria di primo grado*. Poster presentato al X Convegno Internazionale «Imparare questo è il problema», San Marino, 17/18 Settembre 2010.
- BELACCHI C., SCALISI T.G., CANNONI E. E CORNOLDI C. (2008), *Manuale CPM. Coloured Progressive Matrices. Standardizzazione italiana*, Firenze, Giunti O.S. Organizzazioni Speciali.
- CORNOLDI C. E COLPO M. (1998), *Prove di Lettura MT per la Scuola Elementare – 2. Il rinnovamento di un classico set di prove di lettura*, Firenze, Giunti O.S.
- CORNOLDI C., TRESSOLDI P. E PERINI N. (2010), Valutare la rapidità e la correttezza della lettura di brani. Nuove norme e alcune chiarificazioni per l'uso delle prove MT, «Dislessia», Vol. 7, n. 1, pp. 89-100.
- FACOETTI A, LORUSSO M.L., PAGINONI P., UMILTÀ C. E MASCETTI G. (2003). *The role of visual spatial attention in developmental dyslexia: Evidence from a rehabilitation study*, «Cognitive Brain Research», 15, pp.154-164.
- FACOETTI A., ZORZI M., CESTNICK L., LORUSSO M., MOLteni M., PAGANONI P., UMILTÀ C. E MASCETTI G. (2006). *The relationship between visuo-spatial attention and nonword reading in developmental dyslexia*, «Cognitive Neuropsychology», 23, pp. 841-855.
- ISTITUTO SUPERIORE DI SANITÀ (ISS), Sistema Nazionale Linee Guida (2011), *Consensus Conference Disturbi Specifici di Apprendimento*, [http://snlg-iss.it/cc\\_disturbi\\_specifici\\_apprendimento](http://snlg-iss.it/cc_disturbi_specifici_apprendimento).
- RAVEN J. C. (1996). CPM, *Coloured Progressive Matrices, Serie A, AB, B, Manuale*, Firenze, O.S. Organizzazioni Speciali.
- SARTORI G., JOB R. E TRESSOLDI P.E. (2007), *DDE-2. Batteria per la valutazione della Dislessia e della Disortografia Evolutiva. 2° edizione*, Firenze, Giunti O.S. Organizzazioni Speciali.
- STELLA G., FAGGELLA M. E TRESSOLDI P. (2001), *La dislessia Evolutiva lungo l'arco della scolarità obbligatoria*, «Psichiatria dell'Infanzia e dell'Adolescenza», vol. 68, pp. 27-41.
- TRESSOLDI P.E., STELLA G. E FAGGELLA M. (2001). *The development of reading speed in Italians with dyslexia: A longitudinal study*, «Journal of Learning Disabilities», vol. 34, n. 5, pp. 67-78.