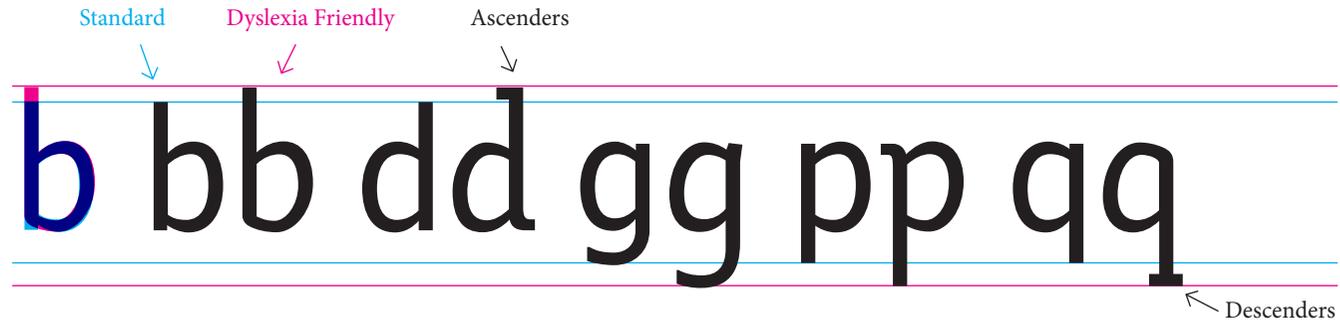


Comparison between
Standard font
and
Dyslexia Friendly (DF) font:
Dyslexia friendly features

Bernardis, P., Galliussi J.,
Gerbino, W.,
Università di Trieste,
Perondi, L., IUAV
Venezia,
Chia, G., ChiaLab
Bologna

Ascenders and descenders
DF font has longer ascenders
and descenders



Asymmetry in letter shapes
The bows of Stanard font are symmetrical,
while the ones of DF font are asymmetrical



Dedicated serifs
Standard font has not serif, while DF font has



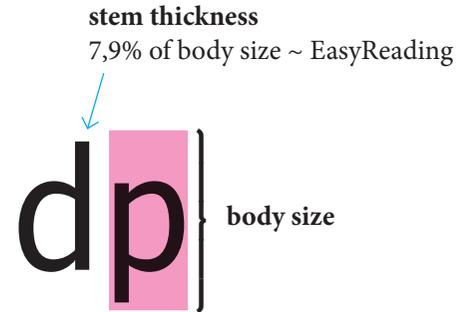
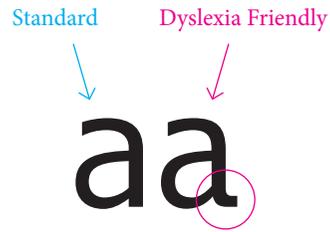
Comparison between
Standard font
and
Dyslexia Friendly (DF) font:
Spacing and stems

Bernardis, P., Galliussi J.,
Gerbino, W.,
Università di Trieste,

Perondi, L., IUAV
Venezia,

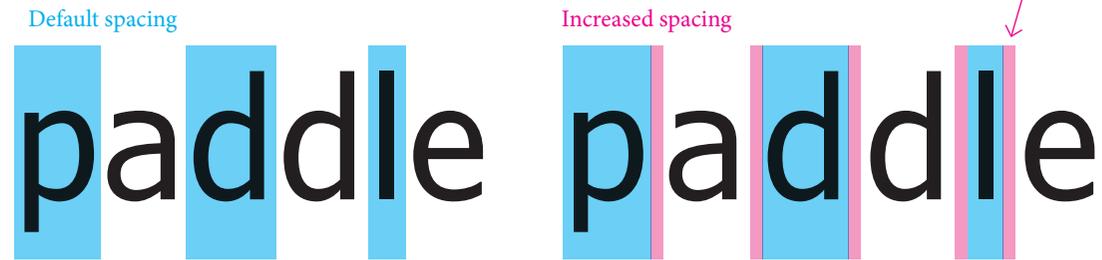
Chia, G., ChiaLab
Bologna

Stem thickness
DF font and Standard font
has the same stem thickness



Inter letter spacing

Increased by 26%, i.e. + 70 1/1000 em, i.e. 0,98 pt on 14 pt body size



Inter word spacing

The inter-word spacing is increased by 100%, i.e. + 270 1/1000 em, i.e. 3,78 pt on 14 pt body size



Comparison between
Standard font
Dyslexia Friendly (DF) font
Verdana Condensed
EasyReading®

Bernardis, P., Galliussi J.,
Germino, W.,
Università di Trieste,

Perondi, L., IUAV
Venezia,

Chia, G., ChiaLab
Bologna

Letter Shape

Standard font has approximately
the same letter shape of Verdana
Condensed

Ascenders and descenders

Standard font has the same ascenders
as Verdana Condensed
DF font has the same ascenders
as EasyReading®

Standard



dislessia

Verdana Condensed



dislessia

Dyslexia Friendly



dislessia

EasyReading®



dislessia

Stem thickness

DF font and Standard font
has approximately the same
stem thickness
as EasyReading®

Dyslexia friendly features

DF font has approximately
the same Dyslexia friendly features
as EasyReading®

Spacing

DF font and Standard font
has been spaced by Igino Marini
with iKern

Comparison between
Standard font
Dyslexia Friendly (DF) font
Verdana Condensed
EasyReading®

Bernardis, P., Galliussi J.,
Gerbino, W.,
Università di Trieste,

Perondi, L., IUAV
Venezia,

Chia, G., ChiaLab
Bologna

Characteristics of the Standard font and the Dyslexia Friendly (DF) font.

The Standard font was redesigned to be very similar in shapes and in mathematical proportions to the Verdana Pro Condensed font, a sans-serif typeface of the Verdana typeface family. The DF font was created ad hoc for the study by adding “dyslexia friendly” features to the Standard font, in particular the resulting font was very similar to EasyReading® a font, especially designed for dyslexics, used in the experiment by Bachmann (2013).

The features are: asymmetry in letter shape, proportion between x-height and ascenders/descenders, stem thickness.

In the Verdana Pro Condensed font, letters have a similar or identical shape after reflection relative to a vertical or horizontal axis, in particular the groups “1-I-L”, “b-d-p-q” (Fisher, Liberman, & Shankweiler, 1978), “o-e”, “u-n-m”. DF font used asymmetric shapes based on the font EasyReading®, including for example big dots in “i-j” group, mixed serif and sans serif letters in “u-n-m”, “1-I-L” and “b-d-p-q” groups (see appendix), vertical or horizontal asymmetry in “b-d-p-q” groups.

The length of the ascenders/descenders of DF font matches mathematically the proportion between ascenders/descenders and x-height of EasyReading®: ascenders are 66% of x-height and descenders are 65% x-height. In Verdana and Standard font ascenders are 48% of x-height and descenders are 38% x-height. The stem thickness in EasyReading® and DF font is ~8% of body size (~16% of x-height), the same with Standard font, which is thinner than Verdana (~9% of body size, ~18% of x-height), as stem thickness is never mentioned as a dyslexia friendly feature, DF font and Standard font had to be identical under this aspect. The resulting font was very similar to EasyReading®, the two fonts showing exactly the same “dyslexia friendly” features. The two fonts used in the experiments, Standard and DF, thus differed only in the absence (Standard font) vs presence (DF font) of the aforementioned dyslexia friendly features.

Appendix 1

Test texts were derived from 8 excerpts taken from children's books. The excerpts were then modified in order to make them comparable according to several psycholinguistic variables. Final texts included the same number of words (83) as well as comparable average number of words per sentence and average number of words per line. In each text, 44 or 45 out of the total 83 words were open-class words (i.e., nouns, verbs, adjectives, adverbs), and the remaining words were closed-class words (i.e., articles, pronouns, conjunctions, prepositions, etc.). Open-class words were never repeated within the same text and across texts. Moreover, texts were equivalent for variables like word and lemma frequency (evaluated using CoLFIS, the corpus and frequency lexicon of written Italian; Bertinetto et al. 2005), and average word length in both letters and syllables (see Table 1).

Table – Characteristics of the open-class words used in the test texts

	Text 1	Text 2	Text 3	Text 4	Text 5	Text 6	Text 7	Text 8	F	<i>p</i>
Word frequency	1605.49 (4240.64)	1490.98 (4209.11)	1172.20 (3949.03)	1283.45 (4032.14)	1578.53 (5372.67)	1102.95 (3925.39)	1441.84 (5360.77)	1549.11 (5445.98)	.078	.999
Lemma frequency	6209.80 (15574.68)	6395.91 (15640.73)	4212.07 (11556.44)	4480.23 (11604.66)	4602.36 (13798.09)	2792.95 (8550.13)	3385.84 (11531.10)	4243.36 (13883.71)	.409	.897
Length in letters	6.36 (2.47)	6.31 (2.38)	6.18 (2.33)	6.39 (2.47)	6.31 (2.40)	6.39 (2.40)	6.39 (2.37)	6.48 (2.46)	.058	1.00
Length in syllables	2.71 (0.94)	2.64 (0.93)	2.60 (0.91)	2.66 (0.96)	2.64 (0.93)	2.70 (0.95)	2.75 (0.94)	2.75 (0.97)	.147	.994

Means (and standard deviations) of four psycholinguistic word variables (word frequency, lemma frequency, length in letters and length in syllables) are reported for each one of the 8 test texts. In the second to last column, the F values, resulting from the Analysis of Variance on the psycholinguistic variables with Text as within-subjects factor, are reported, as well as, in the last column, the corresponding *p*-values. Test texts did not differ significantly in any psycholinguistic variable.

No open-class words with hiatus sequences or diphthongs were included in the texts, which were comparable also for the number of open-class words with double consonants ($n = 11-12$), the number of open-class words with grapheme-to-phoneme conversion rules ($n = 15 \pm 1$), the number of morphologically complex open-class words ($n = 5-6$), and open-class word's type of stress (paroxytone words: $n = 35 \pm 1$; proparoxytone words: $n = 5$; oxytone words: $n = 1$).