

# Wider Letter Spacing Helps Dyslexic Children

ScienceDaily (June 7, 2012) — Increasing the spacing between characters and words in a text improves the speed and quality of dyslexic children's reading, without prior training. They read 20% faster on average and make half as many errors. This is the conclusion reached by a French-Italian research team, jointly headed by Johannes Ziegler of the Laboratoire de Psychologie Cognitive (CNRS/Aix-Marseille Université).

These results were published 4 June 2012 in the Proceedings of the National Academy of Science (PNAS). In parallel, the team has developed an iPad/iPhone application, available under the name "DYS." It allows both parents and children to modify the spacing between letters and thus test the benefits of these changes on reading. This will enable researchers to collect large-scale, real time data, which they will then analyze and study.

Dyslexia is a learning disability that impairs an individual's capacity to read and is linked to difficulty in identifying letters, syllables and words -- despite suitable schooling and in the absence of intellectual or sensorial deficiencies. Dyslexia, which often causes writing problems, affects on average one child in every class and 5% of the world's population.

In this study, the researchers tested the effects of letter spacing on the reading ability of 54 dyslexic Italian and 40 dyslexic French children aged between 8 and 14 years. The children had to read a text composed of 24 sentences, in which the spacing was either normal or wider than usual. The results showed that wider spacing enabled the children to improve their reading both in terms of speed and precision. On average, they read 20% faster and made half as many errors. This progress could stem from the fact that dyslexic children are particularly sensitive to "perceptual crowding," in other words the visual masking of each individual letter by those surrounding it. The results of this study show that this crowding effect may be reduced by spacing letters apart.

This finding opens interesting perspectives in the field of dyslexia treatment techniques. Reading better means reading more - yet it takes one year for a dyslexic child to read what a "normal reader" reads in two days. Reading can be "torture" for dyslexic children, whose decoding difficulties cause to stumble, putting them off reading on a regular basis. The researchers have found a simple and efficient "trick" that helps these children break the vicious circle and correctly read more words in less time.

An iPad/iPhone application known as "DYS" has been developed in parallel with these research results by Stéphane Dufau, CNRS research engineer at the Laboratoire de Psychologie Cognitive. Available initially in French and English and downloadable free from Apple Store, it enables both parents and children to adjust the spacing between letters and to test the benefits of such modifications on reading. The researchers for their part hope to be able to collect large-scale data that will allow them to quantify and analyze whether optimal spacing exists as a function of the subject's age and reading level.

Download available: <http://itunes.apple.com/us/app/dys-help-people-with-dyslexia/id529867852?mt=8>

## Journal Reference:

M. Zorzi, C. Barbiero, A. Facoetti, I. Lonciari, M. Carrozzi, M. Montico, L. Bravar, F. George, C. Pech-Georgel, J. C. Ziegler. Extra-large letter spacing improves reading in dyslexia. Proceedings of the National Academy of Sciences, 2012; DOI: 10.1073/pnas.1205566109

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