

# New research into letter-spacing could help improve children's reading

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Increased letter spacing helps individuals read faster, but not due to visual processing, according to new research from Binghamton University, State University of New York.

"Generally speaking, our lab is interested in learning about how kids learn to read. More specifically, we want to know how the brain activity of kids that have difficulty learning to read differs from those who are not." said Elizabeth Sacchi, a doctoral candidate at Binghamton University. "Through some of my studies, I came across this [effect](#) called the [letter](#)-spacing effect, which is this finding that both kids and adults with or without specific reading impairment read faster and more fluidly when you increase the spaces between letters in words."

Sacchi's research on letter spacing is part of the National Science Foundation-funded Reading Brain Project, directed by Sarah Laszlo, adjunct associate professor of psychology. The Reading Brain Project studies how children read, measuring their [brain activity](#) as they play a computerized reading game. The goal of the project is to help children become more successful readers. According to Sacchi, this is the first letter-spacing research to look at what is happening inside the [brain](#) when reading occurs.

"Everybody seemed pretty certain up until this point that it was about decluttering your visual scene, which may make identifying letters easier," said Sacchi. "What my results show is that it doesn't look like the effect is happening early enough to be related to [visual processing](#)."

Sacchi measured the electrical activity in subjects' brains when they were shown pictures of words, letters that spell out pronounceable pseudo-words, strings of consonants, and a font that is visually similar to real words but has no meaning. She said if the letter-spacing effect was due to visual processing, it would be easier to respond to all of these characters.

"We saw very late effects of spacing, and we saw it the most with real words," said Sacchi. "Increased spacing was very helpful for the words, and less helpful for the pseudo-words and the consonant strings. The fact

that more "word-like" stimuli benefited more than less "word-like" stimuli suggests that the benefit is occurring during a reading-specific process, rather than during a purely visual stage. We don't know exactly yet where it's coming into play, but if we can identify exactly where it is helping individuals during reading, then the idea is that we can employ it more effectively."

Sacchi said she plans to focus her future research on what part of the reading process letter-spacing affects.

"The idea is to go down the line," said Sacchi. "We looked at early visual processing and saw that it doesn't affect early visual processing, so now the next step is to see how spacing affects the processing of sound information during reading. It's this nice progression of going through the different stages of reading to try to find exactly where exactly spacing comes into play."

According to Sacchi, this could also have an impact on who benefits from letter-spacing.

"The general implication of my work is that the letter-spacing effect may not be equally as helpful for everyone. Since spacing letters apart does not help with the very first visual stages of reading, we would expect it to be a better aid to someone having trouble with other aspects of reading. This finding may facilitate the eventual development of more targeted interventions for struggling readers." said Sacchi.

The article, "An Event-Related Potential study of letter spacing during visual word recognition," was published in *Brain Research*.

**More information:** Elizabeth Sacchi et al, An Event-Related Potential study of letter spacing during visual word recognition, *Brain Research* (2018). [DOI: 10.1016/j.brainres.2018.01.028](https://doi.org/10.1016/j.brainres.2018.01.028)

Provided by Binghamton University

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