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For kids, pen's mightier than keyboard

"Children consistently did better writing with a pen when they wrote essays. They wrote more and they wrote faster," says Virginia Berninger.

U. WASHINGTON-SEATTLE—Children with and without handwriting disabilities were able to write more—and more quickly—when using a pen rather than a keyboard to compose essays, according to new research.

[The study](#), headed by Virginia Berninger, a [University of Washington](#) professor of educational psychology who studies normal writing development and writing disabilities, looked at children's ability to write the alphabet, sentences, and essays using a pen and a keyboard.

"Children consistently did better writing with a pen when they wrote essays. They wrote more and they wrote faster," says Berninger.

Only for writing the alphabet was the keyboard better than the pen. For sentences results were mixed. But when using a pen, the children in all three grade levels produced longer essays and composed them at a faster pace. In addition, fourth and sixth graders wrote more complete sentences when they used a pen.

The study was designed to compare methods of transcription, a basic cognitive process involved in writing that enables a writer to translate thoughts or ideas into written language. Both handwriting and spelling are transcription processes.

Previous research by Berninger's group showed that transcription predicts composition length and quality in developing writers. Transcription by both pen and keyboard involves the hands. Researchers, she says, are trying to understand why units of language are affected differently when hands write by pen and by keyboard.

"People think language is a single thing. But it's not," says Berninger. "It has multiple levels like a tall building with a different floor plan for each story. In written language there are letters, words, sentences, and paragraphs, which are different levels of language. It turns out that they are related, but not in a simple way. Spelling is at the word level, but sentences are at the syntax level. Words and syntax (patterns for organizing the order of words) are semi-independent. Organizing sentences to create text is yet another level. That's why some children need spelling help while others need help in constructing sentences and others in composing text with many sentences."

Berninger and her colleagues recruited more than 200 normally developing children for the study. When the children were in the second, fourth, and sixth grades they were given three tasks. For one task they were told to print all lower case letters in alphabetic order with a pen. They were also asked to select each letter of the alphabet in order on a keyboard. In both cases they were told to work as quickly and accurately as possible.

In the second task they were asked to write one sentence that began with the word "writing" while using a pen and to write one sentence that began with "reading" while using the keyboard. Finally, the children were asked to write essays on provided topics for 10 minutes both by pen and by keyboard.

Although most children in the study developed transcriptions skills in an age-appropriate way, a small number showed signs of a specific learning disability—transcription disability. Both the normally developing and those with the disability wrote extended text better by pen than keyboard.

"We don't want to lose sight of the fact that it is important for developing writers and children with transcription disability to be able to form letters by hand," Berninger says.

"A keyboard doesn't allow a child to have the same opportunity to engage the hand while forming letters—on a keyboard a letter is selected by pressing a key and is not formed," she adds. "Brain imaging studies with adults have shown an advantage for forming letters over selecting or viewing letters. We need more research to figure out how forming letters by a pen and selecting them by pressing a key may engage our thinking brains differently."

Findings were published in the journal [Learning Disability Quarterly](#). The Eunice Kennedy Shriver National Institute for Child Health and Human Development funded the research.

University of Washington news: <http://uwnews.org/uwnhome.asp>

Posted by [Joel Schwarz-UW](#) on October 20, 2009.

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One Response

 Very interesting finding! My colleague and I would like to make parents, teachers, and others involved in educational decision making for children with reading and learning disabilities aware of this research on our blog (reading2008.com/blog). Advocates for children with special needs should be aware of research based interventions to increase the likelihood that children will succeed in school and life.

by [Gary Brannigan](#) on [Oct 20, 2009 at 10:14 pm](#)

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