

The pen may be mightier than the keyboard

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(PhysOrg.com) -- When it comes to writing the pen apparently is mightier than the computer keyboard. Second, fourth and sixth grade children with and without handwriting disabilities were able to write more and faster when using a pen 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." said 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 ability to write complete sentences was not affected by the children's spelling skills.

The research also showed that many children don't have a reliable idea of what a sentence is until the third or fourth grade.

"Children first have to understand what a sentence or a complete thought is before they can write one," Berninger said. "Talking is very different from writing. We don't talk in complete sentence. In conversation we

produce units smaller and larger than sentences."

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 said, 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," said 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 transcription 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.

"Federal accommodations for disabilities now mean that schools often allow children to use laptops to bypass handwriting or spelling problems. Just giving them a laptop may not be enough," Berninger said. "Children with this disability also need appropriate education in the form of explicit transcription and composition instruction.

"We need to learn more about the process of writing with a computer, and even though schools have computers they haven't integrated them in teaching at the early grades. We need to help children become bilingual writers so they can write by both the pen and the computer. So don't throw away your pen or your keyboard. We need them both.

"But 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. 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. Brain imaging studies with adults have shown an advantage for forming letters over selecting or viewing letters. A brain imaging study at the University of Washington with [children](#) showed that sequencing fingers may engage thinking. 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," she said.

Provided by University of Washington ([news](#) : [web](#))

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