

Ready, Set, Type! Touch Typists Are Faster, But Not By Much

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The first typewriter, invented by a newspaper printer and editor named Christopher Sholes in 1868, had a keyboard arranged like piano keys. Initially, the inventors thought that an alphabetical arrangement of 28 letters in a long row would be the most logical, easiest to use layout. However, after some experimentation, Sholes and his collaborators discovered that this arrangement wasn't so efficient after all. In 1878, Sholes filed a new patent for the keyboard arrangement that most of us now rely for the bulk of our communications: the QWERTY keyboard.

Exactly how Sholes arrived at this arrangement is still a bit of a mystery. Even after the QWERTY layout became the de facto standard, Sholes continued to experiment with alternative layouts that could increase typing efficiency.

New research led by APS Fellow Gordon D. Logan and a team of researchers from Vanderbilt University compared the speed and accuracy of a group of typists who use the standard QWERTY keyboard technique to a group of “nonstandard” typists who relied, to some degree, on a hunting-and-pecking approach. Specifically, Logan and colleagues were interested in finding out how variations in typing style interact with cognitive and motor processes to influence speed and accuracy.

As the researchers point out, we all start off using the hunt-and-peck technique, using our vision rather than our memories to find the right keys. But, after years of practice, our fingers just seem to know which keys to hit all by themselves; our speed and accuracy increase, and we can devote more of our attention to writing instead of the physical process of typing.

“Hunt-and-peck typing under top-down control creates associations between words, letters, keys, and movements in the motor system, which strengthen with practice. Eventually, the associations become strong enough that the motor system can retrieve the sequence of keystrokes on its own, given only the word to be typed,” Logan and colleagues write. “At some point, typists trust motor memory enough to abandon top-down control and let the motor system control typing. At this point, typing is hierarchical.”

Although hunt-and-peck typists may have years of practice, Logan and colleagues hypothesized that these nonstandard typists would still have to rely much more heavily on visual information compared to typists who use standard techniques. Not only might this visual search slow down their typing efficiency, but it's possible that it might sap cognitive resources away from error detection and composition.

Two groups of typists were recruited: One group of 24 typists self-identified as using the standard QWERTY keyboard finger map, while the group of 24 nonstandard typists said they used another, less conventional, technique. All of the participants said that they grew up with access to computers in their homes, all had formal training in typing, and all but one currently owned a computer.

The researchers tested typists' abilities under three different visibility conditions. In the visible condition, typists simply used a normal QWERTY keyboard with the keyboard letters and their hands visible. In the blank condition, stickers were placed over the keyboard letters, but participants could still see their hands. In the fully-covered condition, a box was placed over the keyboard, so that participants could not see either their hands or the keyboard letters.

Typists typed three paragraphs under the three different visual conditions (visible, blank, and covered) while a video camera recorded which fingers were used to hit which keys.

Overall, standard typists were faster (79.99 vs. 65.63 WPM), and more accurate (around 94% vs. 83% accuracy), compared to nonstandard typists. Nonstandard typists also got "progressively worse as keyboard visibility was reduced, consistent with the hypothesis that nonstandard typists rely on visual guidance more than standard typists."

However, when asked to name the letters on a standard QWERTY keyboard, both groups performed surprisingly poorly. Although nonstandard typists spent more time looking at the keys, their memory for letter locations was not any better than their counterparts'. This suggests that both groups "seem able to type without thinking about letters, keys, and movements, having handed that off to the motor system."

"According to basic psychological laws that govern fine motor skills, the typing style that uses the most fingers consistently should be the fastest and most effective," Logan said in a press release. "Our study confirmed the theory by determining that touch typists have a definite edge in speed but we also found that nonstandard typists can type almost as quickly and accurately as touch typists as long as they can see the keyboard."

"Earlier training on standard mapping may prevent the development of suboptimal habits, but suboptimal habits may be good enough," Logan and colleagues explain.

References

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