

Reading on electronic devices may interfere with science reading comprehension

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In a study, a group of adult readers who frequently used electronic devices were significantly less successful on a reading comprehension test after reading several scientific articles compared to those who used those devices less frequently. Credit: iStock Photo / bowie15

People who often read on electronic devices may have a difficult time understanding scientific concepts, according to a team of researchers. They suggest that this finding, among others in the study, could also offer insights on how reading a scientific text differs from casual reading.

In a study, a group of adult readers who frequently used [electronic devices](#) were significantly less successful on a reading comprehension test after reading several [scientific articles](#) compared to those who used those devices less frequently, said Ping Li, professor of psychology and associate director of the Institute for CyberScience, Penn State.

"The more time the participants reported on using e-devices per day—for instance, reading texts on their iPhone, watching TV, playing internet games, texting, or reading an eBook—the less well they did

when they tried to understand scientific texts," said Li. "There are a lot of positive uses for electronic devices and I'm an advocate of digital learning, but when it comes to understanding of [science](#) concepts through reading, our take is that it's not helpful."

Li said the way people read on electronic devices may encourage them to pick up only bits and pieces of information from the material, while the comprehension of scientific information requires a more holistic approach to reading where the reader incorporates the information in a relational and structured way.

"This is sort of speculation, because, so far, this is only a correlation—When you are writing a text on a smartphone, for example, you use very short sentences and you abbreviate a lot, so it's fragmented," said Li. "When you're reading such a text, you're getting bits of information here and there and not always trying to connect the material. And I think that might be the main difference, when you're reading expository scientific texts you need to be connecting and integrating the information."

Reading science articles is different from reading narratives, as well, according to the researchers, who released their findings in the journal *Reading and Writing*.

"In a lot of ways, reading a science text is different from reading a story," said Li. "In a story, let's say you're reading 'Harry Potter,' you have characters, there's a plot, there's an evolving story line. And that's why we're interested in this. You can easily get engrossed in a narrative, but in reading scientific texts, you are trying to understand new or unfamiliar concepts and how they are related—and that's a very different process."

The research could help both students who need to read science articles, as well as scientists who want to make their information more accessible and

readable, said Li, who worked with Jake Follmer, a former doctoral student in educational psychology; Shin-Yi Fang, postdoctoral scholar in psychology; Roy B. Clariana, professor of education; and Bonnie J. F. Meyer, professor of educational psychology, all of Penn State.

In future research, the researchers will use brain imaging tools to determine what areas of the brain are engaged while reading science texts and whether disengagement of these areas means a failure to understand, according to Li.

The researchers recruited 403 participants through Amazon Mechanical Turk to read eight different scientific articles, which were similar to articles found in a science [text](#) book that covered topics such as electrical circuits, permutation, GPS, Mars and supertankers. The participants read through the articles, which were about 300 words each, or 30 sentences in length, sentence by sentence, at their own pace.

In another study, 107 participants were recruited to read the whole paragraph at once.

After reading each article, they were asked to answer 10 multiple choice questions about the article. Participants were also asked to sort key terms from the [article](#) into groups.

"The sorting tasks are designed to elicit their knowledge structure developed after readers finished reading science texts," said Li. "And this method allows us to see if different people may get different mental relations of the [science concepts](#) or other concepts."

Provided by Pennsylvania State University

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