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Standardized test scores decline with each passing hour of school

by Randy Dotinga, Healthday Reporter



(HealthDay)—While the debate over the value of standardized testing continues, new research suggests that educators should also consider the timing of these tests.

The study found that students aged 15 and under suffered from mental fatigue as the school day progressed, and that their test scores dipped later in the day. The effect appeared to be the greatest on those who scored the poorest—a hint that tests later in the day might hurt struggling students the most.

But there's good news, too: Students seemed to get a brain boost when they took tests after a brief break.

The researchers said their findings support the idea of giving kids some time off during the school day.

"If policymakers want to have longer days, then they should consider having more frequent breaks," said study co-author Francesca Gino, a professor of business administration at Harvard Business School in Boston.

The researchers also recommend that standardized tests be held at the same time of day, to avoid throwing off the results by making some kids take them when their brains are taxed.

The new study is unusual because it's so large and because it explores the role played by breaks during the day, Gino said.

However, the study was only designed to find an association between the time a test is taken and performance; it did not prove a cause-and-effect relationship.

The study appears in the Feb. 15 issue of the *Proceedings of the National Academy of Sciences*.

The researchers reviewed results from about 2 million national standardized tests taken by kids aged 8 to 15. The children attended public schools in Denmark from 2009-2010 and 2012-2013.

The findings revealed that test performance decreased as the day progressed. As each hour went by, scores declined. But they improved after breaks of 20 minutes to 30 minutes, the research showed.

Gino described the effect as "small, but significant."

"We found that taking the test one hour later affects the average child the same way as having 10 days less of schooling," she said.

Gino blames "cognitive fatigue"—essentially, tiredness that affects thinking. "But a break can counterbalance this negative effect. For example, during a break, children can have something to eat, relax, play with classmates or just have some fresh air. These activities recharge them."

While there's debate in the United States about whether teens are exhausted during school because it starts too early, Gino said the researchers don't think sleep—or the lack of it—has anything to do with the findings. And the study shouldn't encourage schools—or testing programs such as the SAT or ACT—to always give tests earlier in the day, she said. Instead, she said, they should be administered at the same time.

Christoph Randler, a professor of biology at the University of Tübingen in Germany, praised the study. While the effects on test scores may be small, he said, they could be meaningful if they affect a student's ability to get into college.

Pamela Thacher, an associate professor of psychology at St. Lawrence University in Canton, N.Y., also endorsed the study. She agreed with Randler that small differences in test scores could be important to a student's future.

As for the value of breaks, she said the findings make sense. "Rest restores the ability to perform," she said. "These results are consistent with virtually every study we have that has spoken to the brain's

requirements for best performance."

More information: Cognitive fatigue influences students' performance on standardized tests, *PNAS*, www.pnas.org/cgi/doi/10.1073/pnas.1516947113

For tips about preparing your kids for tests, try [PBS](#).

Journal information: [Proceedings of the National Academy of Sciences](#)

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