

Why It's Best To Take Tests Early In The Day



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By Carmen Nobel

Here's a tip for parents of school-aged children. If your kids must take a standardized test, it's best to do so either first thing in the morning or right after recess. 

On average, students perform best on tests at the start of the school day. And for every hour later in the day, their tests scores decrease. Why? Because they suffer from cognitive fatigue. In other words, their brains get tired. However, test scores do increase slightly when students get to take a short break immediately before taking a test.

These are among the key findings of a new study, "Cognitive fatigue influences students' performance on standardized tests." Published in the February 15 edition of *Proceedings of the National Academy of Sciences*, the study was authored by Hans Henrik Sievertsen, a postdoctoral researcher at the Danish National Centre for Social Research; Francesca Gino, the Tandon Family Professor of Business Administration at Harvard Business School; and Marco Piovesan, an associate economics professor at the University of Copenhagen and a former research fellow at HBS.

The research provides food for thought as policymakers debate the efficacy and fairness of education initiatives like *No Child Left Behind*, the 2001 United States

Act of Congress requiring federally funded public schools to administer statewide standardized tests annually, and *Race to the Top*, a more recent initiative that depends largely on student test scores to measure teacher efficacy.

“There are all sorts of debates in the United States and, more generally, across the globe about how to improve the quality of students’ life in school—and make sure schools offer the most supportive conditions possible for students to learn and perform well in their school activities and tests,” Gino says. “Often these debates do not carefully consider the influence of external factors that teachers or parents can’t control.”

An Enormous Set Of Student Data

The research team convened early in 2015 when Gino, a behavioral scientist, was working on a project about how time of day affects job interviews. (Note to job-hunters: Try to book a morning interview slot.) “As it turns out, the later one interviews in the day, the lower the score one gets on the interview, as the people conducting the interviews become tired and more cynical throughout the day,” Gino says.

Familiar with Gino’s time-of-day research, Sievertsen and Piovesan approached her with an enormous set of data from Denmark, which introduced a nationwide student testing program in 2010. Appropriately called the National Tests, the program requires all students in Danish public schools to take a series of standardized tests from second grade through eighth grade—roughly age eight through age 15. As it happens, students are randomly assigned to take their tests at different times of day, some in the morning and others in the afternoon. The researchers collected the results of all 2 million tests taken in the school years 2009-2010 and 2012-2013.

“This seemed like a great opportunity to test the effects of fatigue in a different context, with very important implications for parents, teachers, and policymakers,” Gino says.

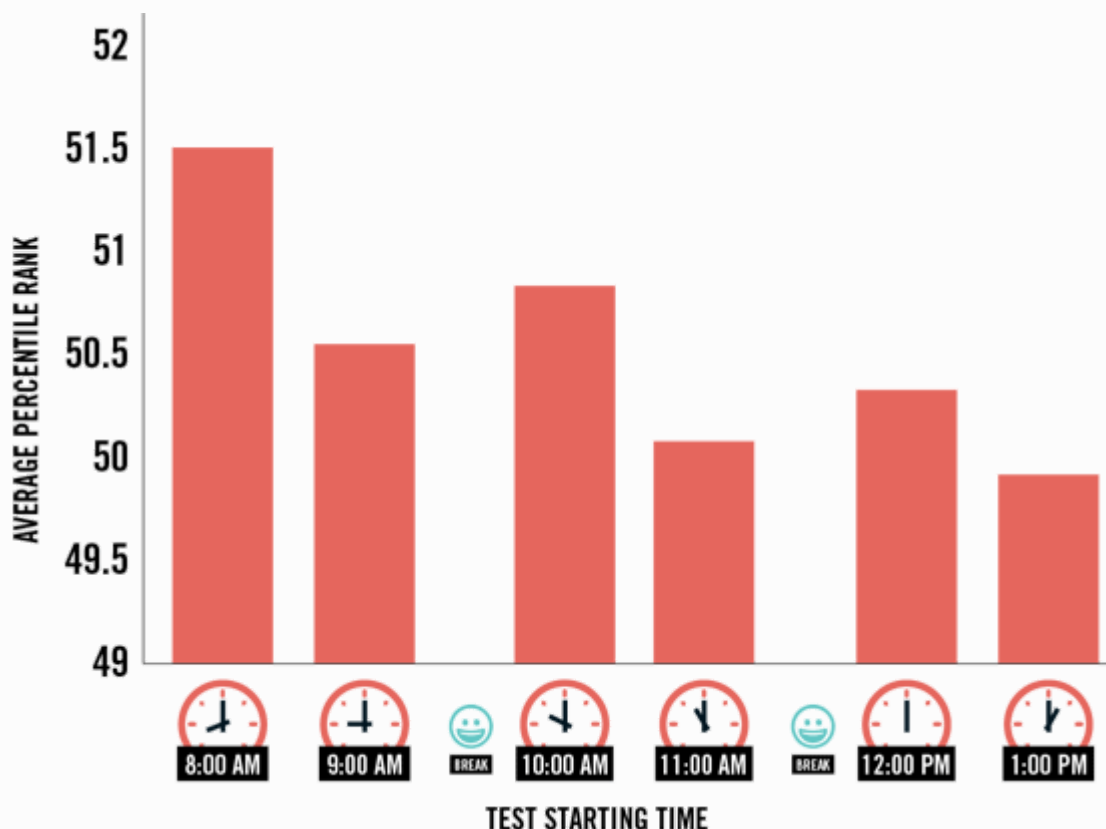
It also happens that most Danish students have scheduled breaks during the school day, typically just before 10 a.m. and noon, which last between 20 to 30 minutes. This gave the researchers a chance to gauge whether recess might thwart the effects of cognitive fatigue.

Like Gino, Piovesan wondered whether related research on adult employees would apply to young students. “I was interested in studying the effect of breaks and their recharging power,” Piovesan says. “In previous papers I have investigated the effect of temptations on productivity. What my colleagues and I found is that a break devoted to satisfy our needs—coffee, cigarettes, Facebook, etc.—can increase productivity.”

Results And Implications

The researchers crunched the data to show the difference in average tests scores for tests taken between 8 a.m. and 1 p.m. They controlled for several external factors, including parental education, birth weight, birthday, the test subject, the quality of the school, and the day of the week.

The results were stark. The average test scores were highest at 8 a.m., slowly decreasing, as the day progressed, to the lowest average scores at 1 p.m. However, there were two exceptions: slight bumps in the scores for the tests taken at 10 a.m. and noon—the times immediately following breaks.



The analysis also revealed that the breaks and time of day affected the lowest-performing students significantly more than the highest-performing students. “This finding has important implications, as it suggests that having breaks prior to testing is especially important in schools with students who are struggling 🐦,” Gino says.

The findings indicate school administrations would do well to standardize the time of day that students take standardized tests. But barring that, the research at least highlights the important role of time of day.

“I see two potential implications,” says Sievertsen. “One, as time of day has an effect, and for some more than others, we should consider whether the structure of the school day is ideal. Should we have more breaks to ensure that low-performing children can recover, for instance? Two, in accountability systems we often compare and evaluate based on test scores. We should be careful in case there are any systematic differences between schools and classes. Do some schools tend to have more tests in the morning than others?”

The research also holds lessons for adults in the corporate world. Bottom line: Managers need to encourage employees to take breaks—and take breaks themselves.

“For many management and knowledge-worker positions, as well as many other jobs across industries, there are no mandatory breaks. Individuals have to decide for themselves whether to pause, take a break and recharge,” Gino says. “Virtually everyone in such jobs recognizes the performance benefits of water-cooler conversations and agrees that people need to take breaks throughout the day, get enough sleep, and take vacations.”

Yet many of us don’t practice what we preach, she acknowledges. So managers can set an example by taking breaks and vacations and encouraging their employees to do the same. Research shows that the restorative benefits of a short break are even greater when people get out of the office for a bit.

“So don’t have lunch at your desk,” Gino says. “Take a short walk outside, especially in a park. It will put you in a better mood and recharge you, allowing you to get more done and help you perform better on the job.”

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