

## Meditate on This New Finding

Anybody who practices the ancient art of meditation will tell you it helps them feel more relaxed and attentive. But does it also enhance performance?

Bruce O'Hara, an associate professor of biology at the University of Kentucky, and graduate student Prashant Kaul wanted to find out, so they devised a study to see how meditation might affect the ability to do a boring task during the mid-afternoon, a time when attention often flags. O'Hara and Kaul used a "psychomotor vigilance task," which has long been used to quantify the effects of sleepiness on mental acuity. The test involves staring at a computer screen and pressing a button as soon as a lighted image pops up.

Typically, people take 200 to 300 milliseconds to respond, but sleep-deprived people take much longer, and sometimes miss the stimulus altogether. Ten UK students were tested before and after 40 minutes of either sleep, meditation, reading, or light conversation, with all subjects trying all conditions.

The results surprised O'Hara. "We found that meditation was the only intervention that immediately led to superior performance, even though none of the volunteers were experienced at

meditation. Every single student who meditated showed improvement," says O'Hara. But, he admits, "Why it improves performance, we don't know."

But what about the heralded power nap? Didn't it fare at least as well as meditation?

"No, everybody got worse with a nap," says O'Hara, "because we had the volunteers start the test immediately after they woke up. A 40-minute nap does tend to improve performance, but only after an hour or so to recover from grogginess."—*JW*

Bruce O'Hara, associate professor of biology, with graduate students Prashant Kaul and Ling Liu, found that to enhance mental acuity meditation is more effective than a power nap.



## Subbaswamy Is New UK Provost

Kumble Subbaswamy has returned to his old Kentucky home—the University of Kentucky. For nearly 20 years, “Swamy,” as his friends and colleagues call him, was a faculty member and department chairman in physics and astronomy, and an administrator in the College of Arts and Sciences at UK. As provost, Subbaswamy, who most recently was dean of the College of Arts and Sciences at Indiana University, is UK’s chief academic officer, overseeing 16 colleges, UK Libraries and the Graduate School.

“I feel truly honored and excited to be back at UK in an academic leadership position at this critical juncture in its history,” Subbaswamy says. “As a ‘complete’ university—a flagship land-grant university with an on-campus medical school—UK has the opportunity to be a national model for the expanded role a 21<sup>st</sup>-century public university should play in the state, nation and the world.”

“Dr. Subbaswamy comes to us with a deep understanding for—and love of—this institution, combined with a record of excellence at other leading universities,” says UK President Lee T. Todd Jr.

“Lexington is where I have spent the most time in my life, and both my children were born here,” Subbaswamy says. “My family and I are happy to be back in the Bluegrass.”—*Jay Blanton*



**Kumble Subbaswamy**

## Minimum Wage Study Turns Up Surprising Results

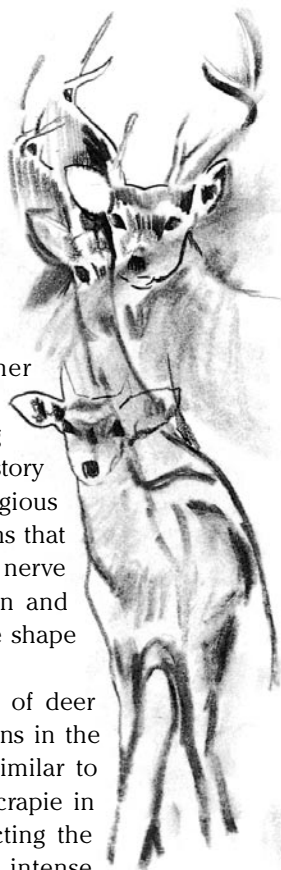
Is a higher minimum wage good for workers? You’d think so, but Aaron Yelowitz, a UK associate professor of economics who piloted a study of a recent minimum wage hike in Santa Fe, New Mexico, would answer the question by saying, “That all depends.”

“What we found is that the living wage hike to \$8.50 an hour the city enacted in 2004 that applied to all private businesses was a good thing for most workers who kept the jobs they had. But this change had an extremely large and negative effect on those with less than 12 years of education,” explains Yelowitz, whose findings have been cited in *The Wall Street Journal* and numerous other publications and broadcasts.

Using mathematical estimations that utilized other areas of New Mexico to control for a variety of economic factors, this study found that after the wage hike, the likelihood of unemployment for employees in Santa Fe went up by 3.3 percent. For less-educated employees, however, the results were much higher, with their likelihood of unemployment increasing 8.3 percent.

If low-wage employees retained employment following the increase, one would expect a significant increase in wages in Santa Fe, Yelowitz reasoned, but there was no statistically significant increase in wages. “This suggests the possibility that less-skilled employees were replaced with more-skilled employees—already earning more than \$8.50 an hour.” Also, he says, some lower-wage workers took home smaller paychecks because employers cut back on overtime in order to absorb the higher hourly rate they were required to pay.

“My research showed that Santa Fe’s labor market lost 540 jobs because of the wage hike, almost all of them among less-educated adults,” says Yelowitz. “Although minimum wages are intended to help poor workers, this was, unfortunately, not the case in Santa Fe.”—*JW*



## UK Researcher Pinpoints Chronic Wasting Disease Transmission

University of Kentucky researcher Glenn Telling's study of infectious prions in deer with chronic wasting disease (CWD) is the subject of a story in a recent edition of the prestigious journal *Science*. Prions are proteins that naturally exist on the surface of nerve cells in the brain of every human and animal, but that somehow change shape and cause damage.

CWD is a neurological disease of deer and elk that produces small lesions in the brains of infected animals. It is similar to mad cow disease in cattle and scrapie in sheep, usually fatal diseases affecting the nervous system and marked by intense itching and loss of muscular control.

The study found the disease is transmitted by animals' blood and saliva, raising concern about animal-to-animal contact with the infected fluids. CWD is known to be transmissible between animals; however, until this study, the exact mode of transmission wasn't known. Although the spread of CWD to humans has not been reported, scientists believe it is possible.

For more about Glenn Telling's research on prions, see "Beware the Shape Shifter" in the Spring 2003 *Odyssey* ([www.research.uky.edu/odyssey/issues.html](http://www.research.uky.edu/odyssey/issues.html)).—*JW*

## UK Gets \$1.8 Million for Math Outreach

Math enrichment in two Kentucky counties is the focus of a new University of Kentucky project funded by a \$1.8 million grant from the National Science Foundation. The grant, known as Algebra Cubed, is funding 10 UK science, math or engineering graduate fellows each year for three years as math specialists in Bath and Powell counties, and also funding 10 teachers who will serve as mentors to the fellows.

The goal of this project is to sharpen the math skills and improve the content knowledge of middle- and high-school students in the two counties. UK graduate students will work on-site with teachers and students 10 hours a week.

"We're introducing new ways of understanding mathematics," says Richard Millman, a UK mathematics professor, who is heading up this project. "And our students are learning teaching skills firsthand from the mentors." Bath and Powell counties were chosen for the grant be-

cause of their low percentage of high-school graduates that go on to earn bachelor's degrees and the desire of teachers and school administrators for improved mathematics instruction.

"To receive a grant of this amount in math is absolutely wonderful for our students, community and teachers," says Nancy Hutchinson, Bath County superintendent.

Rachelle Bouchat, a teaching assistant in math at UK, is one of the graduate students taking part in this program. "Algebra Cubed has allowed me to see firsthand the math preparation students are receiving and has given me the opportunity to help improve students' math skills so that they can be successful in both college and in life." Bouchat works at Powell County High School in Stanton, Kentucky, with Algebra 1, Algebra 2, and geometry classes. "The most rewarding part of this is to see the light bulb go off in a student's head when they suddenly see how to solve a problem."

"The university is a strong supporter of enhancing math skills in rural Eastern Kentucky, and this grant continues to build on two of our ongoing programs: UK's Appalachian Mathematics and Science Partnership and the Appalachian Rural Systemic Initiative," says UK President Lee T. Todd Jr.—*JW*

## UK Climbs in National Research Rankings, Hits Record \$290 Million in Funding

The University of Kentucky moved up two spots in the national rankings used to measure research. The National Science Foundation ranks UK 34th among all public universities and 50th among all private and public universities for R&D expenditures.

UK had another record-breaking year in the nationally competitive arena of grants and contracts, bringing in \$290,365,000 in new, externally funded sponsored projects. President Lee T. Todd Jr. says that this amount, a 6 percent increase over last year's total, demonstrates the university's increasingly high standing among research institutions, as well as a commitment by UK to be a catalyst for positive change in Kentucky. This is the fifth straight year UK has exceeded \$200 million in new grants and contracts.

"Because UK is one of the few universities in the country with colleges of agriculture, engineering, and pharmacy, and a complete medical center on one campus, our broad, collaborative research program directly benefits many people every day," says UK Provost Kumble Subbaswamy.—*DW*

## Good Dental News for Expectant Mothers

Two UK researchers were part of a team that recently studied the connection between periodontal disease and pre-term delivery. The clinical trial concluded that while treatment for periodontal disease is safe for pregnant women, it does not reduce the risk for pre-term delivery, low birthweight, smaller fetal growth, or serious levels of hypertension.

The study, the largest clinical trial ever to try to determine the connection between maternal periodontal disease and increased risk of pre-term birth and low birthweight, was published in November in the *New England Journal of Medicine*.

“Dental treatment is not usually recommended during the first trimester because this is such an important time in fetal development,” says John Novak, professor and associate director of UK’s College of Dentistry’s Center for Oral Health Research. “Periodontal surgery would normally be delayed until after the pregnancy.” James Ferguson, professor and chair in the College of Medicine Department of Obstetrics and Gynecology at UK, worked with Novak on this project, which was backed by a five-year grant from the National Institutes of Health.

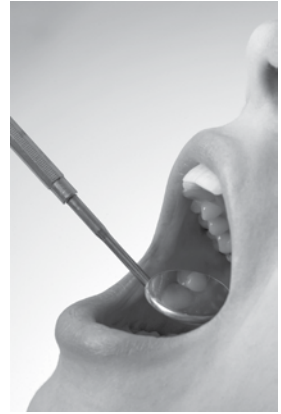
The study, which began in March 2003, enrolled 823 women from Hennepin County Medical Center in Minneapolis, the University of Kentucky in Lexington, University of Mississippi/Jackson Medical Mall in Jackson, Mississippi, and Harlem Hospital/Columbia University in New York.

All of the women had periodontal disease, which is caused by bacteria, plaque and other toxins that erode the gum line. The volunteers, between 13 and 17 weeks pregnant upon entering the study, were divided into two groups: Those who received periodontal treatment (root planing and scaling—scraping the root to clean off toxins below the gums) before the 21<sup>st</sup> week of pregnancy and a control group that received the same treatment after delivery.

“Dental care during pregnancy has long been an issue dominated by caution more than data,” says Larry Tabak, director of the National Institute of Dental and Craniofacial research. “The finding that periodontal treatment during

pregnancy did not increase adverse events is important news for women, especially for those who will need to have their periodontal disease treated during pregnancy.”

For more on John Novak’s research, see “A Mouthful of Evidence” in the Spring 2003 *Odyssey* ([www.research.uky.edu/odyssey/issues.html](http://www.research.uky.edu/odyssey/issues.html)). —JW



## UK Research Now Featured on the ResearchChannel

University of Kentucky research is now reaching more than 22 million U.S. households, thanks to the ResearchChannel, a nonprofit media and technology organization that connects UK investigators with a global audience through cable and satellite distribution. Viewers can also tap into UK research projects through live web streaming and a video-on-demand library that is available 24-hours a day, seven days a week at [www.researchchannel.org](http://www.researchchannel.org).

Several scientists in UK’s Center for Visualization and Virtual Environments have been featured recently, including Ruigang Yang, an assistant professor of computer science, and Samson Cheung, an assistant professor of electrical and computer engineering.

Yang’s project deals with a new approach to 3-D reconstruction in a visual display that he calls a “Light Portal.” In general, this portal will create a 3-D display that does not require the use of 3-D glasses. In order to create multiple angles, Yang uses an array of cameras to capture an object.

Video surveillance for security purposes is the focus of Cheung’s work. He has created programs that can manipulate video surveillance all the way down to the pixel level. For example, if such a video is being used in a court case, bystanders can be “erased.” But these images can be easily retrieved from the video if necessary because images are embedded into a secure watermark.

For more information on these and other UK faculty featured on the ResearchChannel, visit [www.research.uky.edu](http://www.research.uky.edu).—JW