

On Campus: Research 2002-03

Who Are You Calling Old?

More than 35 million Americans are over the age of 65, and by 2030, they will comprise one-eighth of the U.S. population. Thanks to medical advances, average life expectancy has increased from 47 in 1900 to 77.5 today. And the number of people over 85 is growing by three percent each year.

"When you look at the statistics, researchers have an imperative to address aging-related issues," says Kathleen Buckwalter, associate provost for health sciences and codirector, with Robert Wallace, of the University's Center on Aging.

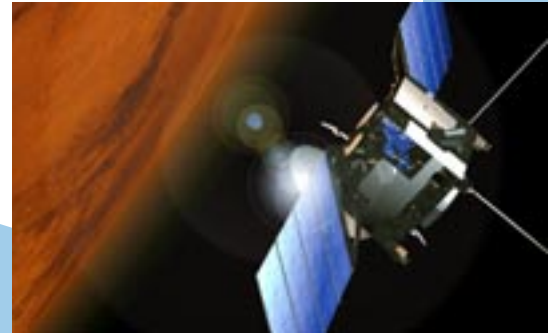
The Center on Aging is a statewide focal point for research, education, and service. Its approach is interdisciplinary, and it maintains an online searchable database of 285 UI faculty and staff members known to be working on the issues. The center's current research interests include fall prevention (Toni Tripp-Reimer, professor of nursing in the College of Nursing), elder abuse (Gerald Jogerst, professor of family medicine in the UI Carver College of Medicine), the needs of older workers (in collaboration with Iowa Workforce Development), and geriatric dentistry (through the College of Dentistry).

Soaking Up News from Mars

In June, a \$7 million radar system built at The University of Iowa was headed for Mars in a Russian rocket that successfully lifted off from a remote launch site in Kazakhstan.

Iowa space physicist Donald Gurnett oversaw five years of research and design on MARSIS (Mars Advanced Radar for Subsurface and Ionospheric Sounding). The Iowa instrument is one of eight aboard the European Space Agency's *Mars Express* spacecraft. NASA funded the Iowa experiment. *Mars Express* is due to arrive at the red planet in late December 2003. After deploying a robotic surface lander, the spacecraft will be maneuvered into orbit, and MARSIS will start its search sometime in March for underground caches of water using ground-penetrating radar over 687 days—one Martian year.

Gurnett and his research colleagues Rich Huff, Don Kirchner, and Jim Phillips in the Department of Physics and Astronomy in the College of Liberal Arts and Sciences developed the 130-foot-long antenna and related electronics that the Mars-orbiting spacecraft will use to probe beneath the planet's surface and to study the ionosphere in the Martian skies. According to Gurnett, the project offers a chance to learn what happened to the water most scientists believe carved the planet's canyons, some of which are longer and deeper than the Grand Canyon.



Scoliosis Diagnosis

A half-century of research by two generations of Iowa researchers shows that an untreated curvature of the spine does not negatively impact a person's health.

The findings challenge the common misconception that late-onset idiopathic scoliosis, the condition that causes an S-like curvature of the spine, inevitably leads to severe disability.

"There's been considerable misinformation that patients with late-onset scoliosis will be crippled and won't be able to have kids or get married, and this study shows that this is not the case," says Stuart Weinstein, the Ignacio V. Ponseti Professor of Orthopaedic Surgery in the Carver College of Medicine and principal author of the study.

The University of Iowa study tracked 117 patients who were diagnosed with scoliosis between 1932 and 1948 by world-famous doctor Arthur Steindler. Most of the patients are doing well and are living completely normal lives, according to Weinstein, who conducted follow-up studies of the patients in 1978 and 1992.

Late-onset idiopathic scoliosis, thought to be genetic, affects two to three percent of children in the United States between ages 8 and 16—about 60,000. Some curves increase in severity over time, but those that are less than 30 degrees usually remain under 30 degrees, Weinstein says.

More than half of all states mandate scoliosis screening by law. Weinstein worries that increased efforts to screen children, coupled with ignorance of the long-term outcomes of this type of scoliosis, could lead to unnecessary tests and anxiety for children and parents faced with the prognosis often associated with late-onset scoliosis. He and his colleagues hope that their findings will provide physicians with information about the disorder so they are better educated about the likely outcomes and process of the condition.

Weinstein inherited the study from 88-year-old Ignacio Ponseti, an orthopedic surgeon famous for research that debunked another myth—the need for surgery for patients who have clubfoot.



One Scholar's Journey

While the country was embroiled in controversy over the future of affirmative action in the workplace and on college campuses, Iowa professor Horace Porter was writing *The Making of a Black Scholar*. Recently published by the University of Iowa Press, Porter's book is the memoir of a young black man moving from rural Georgia to life as a student and teacher in the Ivy League. It is also a history of the changes in American education that developed in response to the civil rights movement, the war in Vietnam, and affirmative action.

Born in 1950, Horace Porter starts out in rural Georgia in a house that has neither electricity nor running water. From the first through twelfth grades, Porter attends Georgia's segregated black public schools, but in 1968, shortly after the assassination of Dr. Martin Luther King Jr., he leaves home in Columbus, Ga., for Amherst College, arriving at the prestigious, mostly white campus on an academic scholarship. Porter's story in *The Making of a Black Scholar* is both unique and representative of an era and a generation, as well as of possibility and achievement.

Porter is chair of African American world studies and professor of English in the College of Liberal Arts and Sciences. He is the author of *Jazz Country: Ralph Ellison in America* (UI Press, 2001) and *Stealing the Fire: The Art and Protest of James Baldwin*.



Freedom Fighters

Conventional history tells us that America's slaves met their fate by either suffering in silence or trying to escape. But an Iowa College of Law professor says there's more to this history than we've been told. Lea VanderVelde recently uncovered a treasure trove of Civil War-era papers that reveal that slaves also fought for their freedom in front of a judge.

The most famous suit for freedom was brought by Dred Scott. His legal battle led to the infamous 1858 Supreme Court decision that denied Scott and all blacks the rights of citizenship, prohibited the federal government from banning slavery, and set the stage for the Civil War. VanderVelde stumbled upon the papers while doing research on another project about Harriet Scott, Dred's wife and a partner in his freedom suit.

VanderVelde discovered boxes of the legal documents in the back rooms of an old St. Louis courthouse. She is writing a book about the suits.

Job Satisfaction

Do companies with satisfied employees have higher revenues? Do those companies have greater customer satisfaction? How can a work environment encourage employees to learn more? What workplace influences help inspire employees to take courses online? Several faculty members of the Henry B. Tippie College of Business answer those questions in award-winning research.

Professor Frank Schmidt explores the concept of employee satisfaction and its effect on business revenues and customer satisfaction in a paper entitled "Business Unit Level Relationships between Employee Satisfaction/Engagement and Business Outcomes." Schmidt and coauthors Jim Harter and Ted Hayes discovered that business units that have higher employee satisfaction also have higher revenues, customer satisfaction, and profitability. The paper was named cowinner of the Best Published Paper Award from the Organizational Behavior Division of the Academy of Management.

Assistant Professor Ken Brown studied the various influences that can affect employee learning in a paper entitled "Influence of Job Characteristics, Perceived Learning Support and Motivation to Learn on E-learning Activities and Outcomes." Brown explored the concept of embedding learning in the daily work lives of employees, emphasizing the active role that learners must play to gain new knowledge and skill. He specifically looked at the features of the work environment and the extent to which job characteristics and perceived learning support influence time spent on e-learning. In addition, he studied how motivation to learn influences the time an employee spends completing online learning activities. His paper won the Society for Human Resource Management's 2003 Research Award.

Brown and Schmidt are faculty members in the business college's Department of Management and Organizations.

Danger on the Farm

Experts in the College of Public Health have collaborated on a study that has the safety of farm families at heart. In results published in the *Journal of Agricultural Safety and Health*, the study, concentrating on 50 homes in Iowa's Keokuk County, measured exposure to pesticides.

Researchers found that the houses of farm families are more heavily contaminated than the houses of families who do not live on a farm. Researchers observed how farmers handle pesticides, and they collected air, dust, and surface samples in order to measure pesticide exposure. Only 59 percent of farmers in the study took simple safety precautions like using tractors with enclosed cabs or wearing gloves, goggles, or respirators. Most farmers brought their work clothes inside their homes and mixed the contaminated garments with regular laundry.

Children living on farms are at risk, according to Wayne Sanderson, associate professor of occupational and environmental health in the College of Public Health. Almost half of the study's 66 farm children did farm chores; six of those children had direct contact with pesticides. Only two of the 52 children from other homes had direct exposure to pesticides. Compared to adults, children take in more air and food relative to body weight, have more contact with the floor, and put their hands in their mouths more often, all of which can mean high exposure to environmental contaminants, according to Sanderson. Researchers focused on one of the most common pesticides in Iowa—atrazine.

