Working toward a New Understanding of Human Health

Exercise scientists develop unique insights into major diseases

Depression. Obesity. Chronic inflammation. These medical conditions draw researchers across the spectrum of health, social, and physical sciences.

But there’s a department in the School of Arts and Sciences that has staked out a unique approach to studying all of those afflictions.

Welcome to the Department of Exercise Science and Sport Studies. The fast-growing department serves more than 1,000 undergraduates, offering three science options and another in sport management.

“It has grown by leaps and bounds,” says acting department chair Neil Dougherty. “The pattern of medicine today, which looks at the whole body rather than just isolated aspects of one’s life, has had a tremendous impact on our field.”

Professors Brandon Alderman, Sara Campbell, and Greg Henderson are among the newest faculty members in the department’s science concentrations. The three bring a passion for teaching and research, and a commitment to addressing major public health issues through the lens of exercise.

In Alderman’s recent research, for example, students battling depression engaged in brisk aerobic workouts as well as meditation at campus recreation centers.

“I am particularly interested in the effect of exercise on mental health,” says Alderman, who is collaborating on the study with faculty from the psychology department and the Center of Alcohol Studies.

As an exercise scientist, Alderman’s research mission was to acquire data about changes in the students’ cardiovascular responses, and the electrical activity of their brains using EEG.

(continued inside)
A Once Reluctant Student Finds Purpose in Eclectic Pursuit of Knowledge

An undergraduate career stands as testament to liberal arts and sciences.

Mark Hansen had his doubts about going to college. He was a creative thinker with a flair for finding alternative paths. “My parents pushed me to go to college,” he says. “I wanted to start a record label.” So he compromised by studying sound recording and music business at a school in Connecticut.

But Hansen experienced a political awakening that caused him to re-think his future. He wanted to contribute to the public conversation about political and social issues, but in a way that would highlight overlooked perspectives and resonate with ordinary citizens. “You can’t expect every person to have the time or energy to develop a stance on every problem,” he says. “So I feel that the best way to get people involved is through art, music, and mass culture.”

Convinced he needed a more comprehensive education, he transferred to Rutgers and began a relentless pursuit of knowledge.

At the School of Arts and Sciences, where he is a senior in the Honors Program, he has taken off in multiple directions with his studies, drawing intriguing connections between humanities, social and behavioral sciences, and fine arts.

He’ll graduate with degrees in American studies and visual arts. But he has also focused on cultural anthropology, Middle Eastern studies, and political science.

Hansen describes his eclectic academic record as a response to a complex world facing complicated problems. It’s also a testament to the enduring appeal of the liberal arts and sciences.

“I felt it was better to have an understanding of many disciplines, rather than sticking with a single field,” Hansen says. “I felt that innovative thinking came from an interdisciplinary approach.”

Indeed, this semester he plans to work with students from the Department of Biomedical Engineering on a mobile game/application aimed at detecting autism and other developmental disabilities in children.

He is planning on a career in architecture, but in a capacity that goes beyond designing buildings. He wants to explore how architecture can help strengthen communities and contribute to civic life. Ultimately, he is seeking work that will benefit society.

“I feel lucky that through fate, or through chance, I am here at Rutgers, and I have resources at my disposal,” he says. “I have no excuse not to help those who did not have such luck.”

Keeper of Tradition

Larry Paragano has created a scholarship to preserve Italian language and culture in New Jersey.

It was 1938 when Nazario “Larry” Paragano’s family moved from a small village in southern Italy to Newark, New Jersey.

Paragano, 7 at the time, remembers having to fetch hot or hot water in the family’s second-floor walkup at Bergen Street and 14th Avenue.

Despite the economic challenges, Paragano says those early years in America were rich with family, faith, and friendships.

“I actually think our children are not as fortunate as we were,” he says. “I had uncles, aunts, and cousins all living close by. We saw them at least once a week and most of the time a lot more.”

Paragano, who went on to become a highly successful builder and developer, feels a responsibility to share his life experiences and heritage with younger generations. His autobiography, Life’s Dreams and Realities, provides an in-depth examination of his family’s roots in Italy and the move to America. He also was one of the founders of the New Jersey Italian and Italian-American Heritage Commission, which is located at Rutgers.

And most recently, Paragano has funded a scholarship for the Department of Italian in the School of Arts and Sciences.

The Paragano Family Foundation Endowed Scholarship for Italian Studies will provide tuition assistance to full-time graduate students, with a preference for those in the master’s in teaching program.

Laura S. White, a professor of Italian, said the scholarship will help preserve Italian language and culture in New Jersey.

“The interest in Italian is growing, and there is a need for good, well-trained teachers at the secondary school level,” White says. Paragano says that in an increasingly mobile society, children grow up without access to grandparents and others who can pass on traditions.

“They are younger generations that haven’t had the opportunity to learn about their heritage,” he says. “We want to reach them and provide them with that opportunity.”

Paragano was born in Camella, a village in the Salerno province. “It was beautiful,” he says. “And it had the best mozzarella anywhere in the world.”

After settling in America, his father, Vincent, started a construction business, which Larry would expand into one of the largest in the state.

He has never forgotten his roots. He has been active in many philanthropic activities, including renovating the centuries-old church in Camella.
“It’s very exciting because nobody really has a full grasp of the precise mechanisms by which exercise works to cause a lessening of depression,” Alderman says. “Our approach gives us a better chance of understanding the finer neurophysiological details.”

The three professors were all biology majors in college who saw exercise science as the natural path for their interest in life science.

“One of the great things about exercise is that you can apply it to anything,” Campbell says. “The whole concept of using exercise to combat disease has always fascinated me.”

Campbell’s current work may shed light on inflammation, which is a common characteristic of some of the most intractable illnesses. She and her students are exploring how fat molecules can compromise the intestinal lining, leading to inflammation. She says exercise science is a particularly rewarding field because it involves complex science yet also has the potential to help patients take more control over their own health.

“Our primary question in this research is: how does exercise influence the intestinal integrity?” she says. “But we’re also asking: how can we use exercise to treat and prevent this?”

Henderson too is focused on fat, but his specialty is the metabolic system, and how exercise contributes to the breakdown of fat molecules. His recent research, in collaboration with professor Shawn Arent, focuses on obese adults, exploring the impact of a single bout of exercise prior to a meal.

“Accordingly, he employs sophisticated life science technology, such as isotopes and mass spectrometry, to gain a deep look at the metabolic process and to learn how exercise changes the relationships between different types of fats in the body.”

“I’d like to make discoveries that can be relevant to heart disease and type 2 diabetes, but I think it’s incomplete to study those diseases outside of the context of exercise,” he says. “Exercise directly affects those metabolic pathways that set the stage for the diseases.”

Students majoring in exercise science have their sights set high, with goals that include medical school, graduate research, and careers in physical therapy and fitness management.

“What I like about this major is that it gives you a whole body perspective,” says senior Stephen Shihbel, a member of Campbell’s research team. “It takes what I’ve learned from the traditional sciences and puts it back in relation to the whole body.”

Senior Ryan Lavall, a member of Alderman’s research team, plans on going to medical school. He hopes one day that exercise science will move to the forefront of modern medicine.

“A lot of doctors today can prescribe exercise but it may be very general,” he says. “But as exercise scientists practicing medicine, we can provide more accurate and more precise programs that might ultimately help to heal people.”

To learn how exercise scientists at Rutgers are teaming up with psychology faculty to treat depression watch the video at: sas.rutgers.edu/exercise.

CONFRONTING THE PRESERVATION CHALLENGES OF THE 21ST CENTURY

A global gathering reflects the vision of the cultural heritage program at SAS

It was Rutgers University in New Brunswick, New Jersey. The conference last fall was assembled by a relatively new but fast-growing program at the School of Arts and Sciences, Cultural Heritage and Preservation Studies, or CHAPS.

“It’s our challenge to work together for a conservation plan that respects the complexity and wealth of diverse values in this rapidly changing world,” CHAPS director Arthur St. Clair Harvey told the audience in opening remarks.

CHAPS is a graduate and certificate program in the Department of Art History that explores how communities understand, preserve, and protect their heritage. Scholars at CHAPS envision heritage in many ways—architecture, monuments, or something more intangible such as nature and cultural traditions.

CHAPS graduates go to work in museums, architectural firms, preservation advocacy groups, and government agencies. They may become planners, land use lawyers, or restoration contractors.

“You get a very broad perspective,” says student Aisla Weiner, who worked as an architect in Israel before joining CHAPS. “It gives me a new set of tools and system of understanding.”

“On the themes we discussed, on the issues that we are facing, we all have a role to play,” she says. “It’s great to be part of that discussion.”

Jolanda van Damme, an exchange student studying archaeology in the Netherlands, agrees. “At CHAPS, I am not just reading archaeology papers. I am reading the work of historians, public policy experts, and philosophers,” she says.

The conference, which drew everyone from U.S. Park Service officials to a master farmer/philosopher/activist from Tajikistan, demonstrated that CHAPS is becoming increasingly prominent.

“Our goal on global heritage distinguishes us from many other programs,” St. Clair Harvey says.

The conference marked the 40th anniversary of the landmark World Heritage Convention, which was adopted by the United Nations Educational, Scientific, and Cultural Organization (UNESCO). The theme of the conference was cultural landscapes—a holistic approach that goes beyond preserving property to take into account the surrounding landscape and communities.

Lauren J. Kone, a CHAPS graduate, says the conference provided an essential exchange of ideas on a seminal topic.

“The participants—war veterans, tribal elders, university professors, community leaders—all contributed to the conversation. We were all engaged!” she says.

It was a conference about how to protect the world’s most precious heritage sites and it was a conference about how we are all connected—through history, through place, through a shared responsibility to the past.”

One of the success stories of this conference was how everyone came away with handfuls of ideas that they can bring back to their communities and apply to their work,” Kone says.
Motivated by High Ideals, She Finds Fulfillment in Geography

A graduate student is working in Bangladesh to improve living conditions.

When Alison Horton began contemplating career paths, she was drawn to professions that valued social justice. She thought about becoming a social worker or an urban public school teacher. But the field that most appealed to her ideals was geography.

“In college I was flipping through the course book and circling classes I wanted to take,” Horton says. “There they all were: world hunger, poverty, migration issues, water resource management, population.

“As it turned out, they were all geography.”

Now working on her Ph.D. in the geography department at the School of Arts and Sciences, Horton is not only studying those issues in depth, she’s witnessing them firsthand.

The upstate New York native is spending the year in Bangladesh after winning a prestigious new Fulbright award that allows recipients to serve in foreign countries as special assistants in government ministries.

The Fulbright Public Policy Fellowship, which is in its inaugural year, aims to help scholars gain public-sector experience in an international setting while carrying out a related research project.

Horton, one of only 17 fellows nationwide in the program, is living in Dhaka, the nation’s capital city, and working in the Ministry of Education.

She’s conducting her own research in off hours, focusing on ways to reduce poverty and improve living conditions for the country’s poorest citizens, with an eye toward alternative, community-based solutions. Though smaller in area than the state of Iowa, the country has a population of 150 million.

“I am immersing myself in the culture and humbly observing how the local people are working to improve their own country,” she says. “Bangladesh is extremely densely populated and incredibly impoverished, and the government is willing to take some alternative approaches toward improvement.

“I feel very fortunate to be placed within the ministry at such a fascinating time, and hope that I’ll be able to learn from, and contribute to, the new policies.”

Indeed, her fellowship comes at a time of rapid change for Bangladesh. The country is working toward its Millennium Development Goals, and has made strides in reducing poverty, increasing access to education, and improving the environment, according to the United Nations Development Programme.

Horton says one reason she chose geography is its ability to examine multiple and complex issues in the developing world.

“I really admire the approach of geographers,” she says. “Many scholars examine and understand poverty through a strictly economic lens, a geographer also takes into account, for example, culture, politics, religion, climate, postcolonialism, and gender.”

Professor Trevor Birkenholtz, Horton’s advisor, agrees.

“Geographers are very good at asking ‘why’ questions,” Birkenholtz says. “We want to understand why Bangladesh is the way it is, with respect to its historic colonial relationships, where it sits in global political and economic relationships.”

Birkenholtz says Horton’s assignment in the education ministry coupled with her own independent research makes for an extraordinary opportunity to understand Bangladesh.

“For many researchers, it’s really difficult to interact with the organizations that set the policy,” he says. “Alison has made the connections that most academics make only after years and years of work.”

The geography department at the School of Arts and Sciences is an interdisciplinary and academically rigorous program that encompasses a range of fields, from cartography to environmental protection to international studies.

“Geography develops students’ technical skills—map making and spatial data analysis—but also provides them with a well-rounded sense of their place in the world,” department chair Richard Schroeder says. “We produce global literacy.”
Rutgers is forging critical partnerships with New Jersey school districts—an act of community outreach that can have lasting benefits for the state’s educational system.

Sayreville, New Jersey, who recently completed the Rutgers PEMS program. “Now I spend a lot of time talking with my students about what it means, I draw pictures and use manipulatives so they understand what’s being done and not just memorizing.”

For Mike Smith ‘07, a teacher at the Carl Sandburg Middle School in Old Bridge, New Jersey, the program showed him how to effectively demystify math for students.

Smith’s eighth-grade math class is like a continuous conversation centered around algebraic problems on a smart board that gets students connected and talking about the material. He asks pointed questions, trying to draw students out so he can understand their thought process and pinpoint where they are faltering. He’s always ready to tailor his explanations so that students can better grasp the concepts.

“I’m trying to help students get a deeper understanding.” Smith says. “Through the questioning, I want to see how they’re coming up with the answer, and whether they understand the concept or are just following the instructions.”

About 50 teachers have completed the PEMS program and another 50 are current students. The teachers can take the courses as part of a master’s in education program or as stand-alone professional development through the GSE. A total of 15 districts from across New Jersey are participating.

The overall vision was evident last fall when students at the Long Branch Middle School were given a problem to solve that involved pizza. Specifically, they had to figure out how many different combinations customers could order given the available toppings.

As they enthusiastically worked out the problem, teachers in the PEMS program worked their way around the room, talking to students, monitoring their progress, but taking care not to give away the answer.

“Because when you lead them, it’s not their solution,” Judith Landis, a GSE instructor and veteran educator who led the exercise, told the teachers afterward.

Landis says the beauty of such “thoughtful mathematics” is watching students think for themselves and work their way toward a solution.

“And that’s where math should always be,” she says.

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Students Explore 21st Century Issues in Signature Courses

Signature Courses cover topics of enduring importance and establish communities of intellectual exchange. Designed and taught by scholars renowned for their research and teaching, Signature Courses combine lectures with small discussion sections. Read below about the Signature Courses that will be offered this fall and watch the video at iasc.rutgers.edu/sign.

Conservation
Richard Schoneder, Geography
What are the scientific, moral, political, and economic dimensions of balancing nature conservation and human needs?

Genetics, Evolution, and Human Health
Kent McGlynn, Genetics
Why do humans still get sick? What societal and medical changes would be required to improve human health?

Eating Right: The Ethics of Food Choices and Food Policy
Andy Egan, Philosophy
How can we reason ethically about individual choice and social action influencing how food is grown, processed, distributed, and consumed?

Energy and Climate Change
Alan Goldman, Chemistry
What is the energy problem? Learn what energy is, how we make it, how we use it, and how we will have to change the way we make it.

Extinction
Rob Scott, Anthropology
What role do natural and cultural processes play in the extinction of languages, cultures, religions, human groups, and other species?

War: Critical Perspectives
Ettel Brooks, Women’s and Gender Studies
What is the role of war? What are the experiences and historical/cultural contexts of war at home and for displaced populations?
HELPING UNDERGRADUATES DISCOVER THE RESEARCH UNIVERSITY

The annual Arex Undergraduate Research Symposium seems to get bigger every year. In 2012, the Rutgers Student Center was overflowing with people checking out the many research projects on display. This year, the symposium takes place April 19 at the student center on the College Avenue Campus. Chuck Kerton, faculty director for the Arex Research Center, and an astrophysics professor in the School of Arts and Sciences, discusses how the center is expanding its mission to help undergraduates get involved in research.

Q: How does Arex go about getting undergraduates doing research projects?
A: There are different stages in which a student might like to be involved in research. Several programs match students with faculty research projects and provide financial support as early as the summer before sophomore year. Other programs help experienced researchers with funding for expenses.

Q: Can you tell me about your new program for first-year students?
A: The Arex-Byrne Program is introducing students to inquiry-based learning in a seminar setting and then having them test their findings in a research environment. The goal is get students involved in research in their second semester at the university.

Q: What was the response when the seminars debuted this semester?
A: They filled up quickly. The student interest was exciting. We plan to offer more next year.

Q: Arex supports research in all areas. To what extent are non-science disciplines taking advantage of the Arex program?
A: At this point in the Research Assistant program, about half of the projects are not in the hard sciences. They’re in the social sciences or humanities. We’ve seen some fantastic projects. And we’re happy to talk with faculty about how to sculpt a project that would be appropriate for an undergraduate.

When we give presentations and explain to faculty and students what we do, they say, “Yes, I want to do that.” We are in a fortunate position to be able to support more projects next year if we get more faculty involved.

Q: The symposium drew nearly 400 presenters last year. How was the audience turnout?
A: It was equally impressive. What feels really good is faculty will spend hours there. The university president has always attended and so has the vice president for undergraduate education. The students see that they do matters and that it’s recognized at the highest levels of the university.

The Arex Research Center is named for the late James Arex, a Rutgers alumnus, and his wife, Loraine, who provided funding to establish and sustain the program. Learn more about the program at arex.rutgers.edu.

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SAS Benefits From New Endowed Chairs

The Murray and Charlotte Strongwater Endowed Chair in Neuroscience and Brain Health: Created in February 2012 by Rod Balf and Beyond CEO Steven Tenenbaum ’80CTE and his wife, Amy, the chair honors Amy’s parents and is designed to recruit and retain an eminent scholar in the field of neuroscience. The chair will serve as the director of the Brain Health Institute, which investigates new ways to treat, cure, and prevent neurological disorders such as autism, Alzheimer’s disease, and amyotrophic lateral sclerosis.

The Gregory G. Brown Endowed Chair in Cell Biology and Neurosciences: Created by the Motorola Solutions Board of Directors in May 2012, this chair honors the leadership and impact of company CEO Greg Brown LC82. The holder of this chair will direct research to find treatments—and, potentially, cures—for strokes, Alzheimer’s disease, brain and spinal cord injuries, dementia, and other debilitating conditions. The chair was selected as a tribute to Brown’s mother, Warliced Brown, who suffers from dementia.

Q&A

Rutgers University celebrates its 274th year as a land-grant institution and 1,643 current first years scored above 2100 on their SATs.

The School of Arts and Sciences is the school for liberal arts and sciences on the New Brunswick Campus of Rutgers, The State University of New Jersey. The School of Arts and Sciences carries on the tradition of excellence founded nearly 250 years ago by Rutgers College and expanded by the three other liberal arts colleges established in the 20th century: Douglass College, Livingston College, and University College. With more than 20,000 undergraduate and graduate students, 800 full-time faculty, and more than 70 majors and minors in biological and physical sciences, humanities, mathematics, and social and behavioral sciences, the School of Arts and Sciences is the largest unit at the university, combining excellence in teaching with world-class research and preparing students to meet 21st-century challenges.

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