

# uncg research

Spring 2018

Research, Scholarship and Creative Activity

## TO BOLDLY GROW

pg. 14





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Over the last year, UNC Greensboro celebrated its 125th anniversary. The occasion has given us time to remember our past — but also to envision our future. I was recently reminded of what a gift such moments are during UNCG's 2018 Conference on African American and African Diasporic Cultures and Experience, where a presenter introduced me to the concept of Sankofa.

The term, from the Akan people of Ghana, means “to go back and fetch it.” It is typically heard as part of a proverb that translates to “it is not wrong to go back for what you have forgotten or lost.”

The symbol for Sankofa is a bird looking backward, with an egg in its mouth representing the future. The proverb has been particularly important to peoples of the African Diaspora, for whom the meaning has evolved to “remembering the past, to protect the future.”

As UNCG looks forward, I find myself thinking that Sankofa holds important lessons for us as scholars. The concept weaves through much of our work, as is evidenced in this latest issue of UNCG Research Magazine.



Brass weight from Ghana in the form of a Sankofa bird.

The rings of ancient alpine larch trace the rise of global warming. Our responses to a 1906 earthquake and 2005 hurricane offer insight into how we will face coming natural disasters. A previous generation's exposure to BPA dictates a medaka fish's reproductive health. A queer network of exchange in the early 1900s illustrates how women have lifted and continue to lift one another up in the face of overwhelming odds.

In each story, the same lesson: to build a better future, we must understand our past.

To make our next leap in space, we must go back and comprehend basic mechanisms of plant biology, evolved long before we took our first steps out of the primordial ooze. We have to play the long game, as we have in UNCG's quarter-century effort to teach kids life skills and build stronger communities through sport — refining our models as we go, in response to lessons learned.

Of course, no project better embodies Sankofa than the Digital Library of American Slavery, where researchers and students are working to bring some of the 4 million enslaved and forgotten back into the light. The library is for descendants of the oppressed and the oppressors. Because we cannot move forward together without facing our past.

As UNCG takes its next giant steps into the future, may we be like the Sankofa bird. Boldly winging forward, yet always conscious of our past and the hard-won wisdom it contains.

**TERRI L. SHELTON, PHD**  
Vice Chancellor for Research and Engagement

UNCG Research has launched a new website. Enjoy additional photography, shareable stories, and more at [researchmagazine.uncg.edu](https://researchmagazine.uncg.edu).

FEATURES



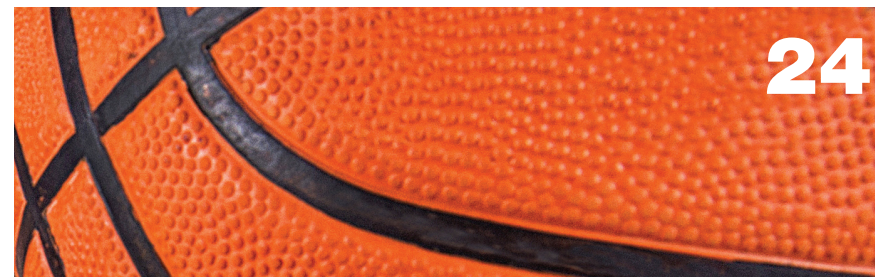
To Boldly Grow

Scientists direct plant growth experiments on the International Space Station, with the ultimate goal of helping humans travel farther in space.



Assembly Required

A home. A community center. A playground. How can designers make sure their creations truly meet people's needs? The Center for Community-Engaged Design places community partners at the core of the creative process.



The Long Game

Sports can teach children important skills and values. But for optimal impact, you need an intentional, educational approach. A 25-year effort at UNC Greensboro equips kids for success.

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*The collection was part of Colson Whitehead's research for his Pulitzer-winning novel "The Underground Railroad," which features a runaway slave ad from the database in its opening pages. Whitehead (left) has praised the project and came to UNCG in February to talk about his work and speak with students.*

# Stolen Names

One undeniable vestige of American slavery is that 4 million people remain nameless, lost to a brutal era that stole everything, including their identities.

Over the past 25 years, a team at UNC Greensboro has been chipping away at this forgotten history, working painstakingly to uncover and publish the names of those held in bondage. Thanks to this effort, UNCG now houses one of the largest databases of slave names on the internet.

With references to more than 170,000 people, the Digital Library of American Slavery still represents just the tip of the iceberg. But it's making a difference to 60,000 users each month, including African American genealogists, academic researchers, and best-selling authors.

## IT BEGAN WITH PAPER — LOTS OF PAPER

The seed for the project took root decades ago, with the groundbreaking work of Dr. Loren Schweningen, professor emeritus of history at UNCG. Schweningen, then a protégé of renowned historian Dr. John Hope Franklin, received a grant to study court documents related to slavery, such as petitions for freedom, wills, and bills of sale.

Between 1991 and 1994, Schweningen traveled to 160 county courthouses and 14 state archives in Southern states. On the road nearly every other day, he brought reams of photocopied documents back to his office in the McIver Building. "We had documents piled up to the windows, and my wife Patricia put them in order," Schweningen recalls.

He and two assistant editors spent the next 15 years summarizing the data, which was eventually transferred to 168 reels of microfilm. Over the years, Schweningen received \$1.47 million in grants and eventually shared a prestigious Lincoln Prize for his work. But as he neared retirement, he wondered what would become of the information — and how it could be preserved and used by future generations.

## FROM MICROFILM TO THE WORLD WIDE WEB

Schweningen approached UNCG Libraries, which took the project and ran with it.

Led by Richard Cox, digital technology consultant, the team built a searchable database of the material known as the Race and Petitions Project.

"For genealogists, for historians, for people interested in slavery and American history, it's a really terrific resource," Schweningen says.

People have used the database to uncover names of enslaved relatives. Others have made the harsh discovery that their own ancestors were slave owners. Historians and the public can search its wide index of more than 150 topics ranging from education, religion, and marriage to farming, disease, and economics.

"This database truly gives a snapshot of life at that time," Cox says. "It's the only single location where you can find that amount of data originating from public records. The only comparable web application is ancestry.com, and that's behind a paywall."

Today, Cox and the library staff continue to add information from other sources, including slave ship registries compiled by Emory

University and insurance company records that list slaves as property.

The digital library also has more than 2,300 runaway slave ads published in North Carolina newspapers from 1751 to 1840. UNCG has shared these ads with Cornell University, which is building a national registry of similar materials.

## CARRYING THE WORK FORWARD

UNCG history majors are now reviewing microfilm of newspapers from the 1850s and 1860s and entering images of additional ads into the digital library, says Dr. Lisa Tolbert, associate professor of history. Other students are using the database to learn research methods and to compile digital exhibits.

The brutality of the ads — some seeking slaves returned dead or alive and others juxtaposed alongside mundane reports such as livestock notices — have deepened students' understanding of what it means to treat people as property, Tolbert says. They have also inspired students to conduct further research, she says, "to recover the human stories of the runaways."

"This gives students real-world experience with history on the web," she explains. "The library at UNCG sees teaching as a vital part of its mission, and I feel lucky to be working here because of the support we receive."

For Cox, the quest for more names continues. He recently applied for a three-year grant to gather slave deeds from 30 North Carolina counties. For him — as it was for Schweningen — uncovering the past is a labor of love.

"Taking care of this — and expanding this database — is something I take very seriously," he says. "I feel I have an obligation to the people named in the documents."

*By Dawn Martin • Photography by Mike Dickens & Martin W. Kane  
Learn more at <https://library.uncg.edu/slavery>*

## WORK IN PROGRESS

Dr. Schweningen (center) and his two assistant editors Nicole Mazgaj and Marguerite Ross Howell — a UNCG history graduate — as well as several graduate students spent 15 years analyzing and summarizing the original data. The work was supported by agencies such as the National Historical Publications and Records Commission, the National Endowment for the Humanities, and the Charles Stewart Mott Foundation.

Now, Cox (left) is partnering with universities such as Cornell and Emory to further the library's reach, while UNCG history students working under Dr. Tolbert (right) continue to expand the runaway slave ad collection. Some students have been inspired to begin their own research, with topics ranging from an exploration of the experience of female runaways to a look at the constructs of African American masculinity.





# FIRE & ICE

Last year, more than 10 million acres burned in the United States, making 2017 the second-worst wildfire season in recorded history.

There were many contributing factors — unusually strong winds, high temperatures, and the century of fire suppression that has allowed biomass to build up on forest floors.

One surprising culprit? Arctic sea ice.

The newest findings from UNC Greensboro Professor of Geography Paul Knapp are what he likes to call “accidental science.”

In 2015, Dr. Knapp and his colleague Dr. Peter Soulé, a faculty member at Appalachian State University, were in Montana studying alpine larch — a conifer native to northwestern North America. While working on another project, they noticed that wide tree rings corresponded with years of increased wildfire activity in the Northern Rocky Mountains.

From there, they decided to take a look at the relationship between the tree rings and levels of sea ice. The two confirmed that wider rings corresponded with years of low sea ice, which led them to the next logical question: Is there a relationship between fire activity and Arctic sea ice?

According to their recently published study — which examined Arctic sea ice extent and wildfire activity for seven regions in the western U.S. from 1980 to 2015 — the answer is yes: The rapid decrease in Arctic sea ice in recent years has likely helped create the conditions for increased wildfire activity, specifically in the northwestern United States.

Knapp explains that when Arctic sea ice is lost, the jet stream becomes wavier, creating ridges with high pressure and troughs



**DENDROCHRONOLOGY** Knapp directs the Carolina Tree-Ring Science Laboratory at UNCG.

with low pressure. These ridges are forming over the Northwest, resulting in very warm, dry conditions that set the stage for increased wildfire activity.

“What’s going on at high latitudes is clearly impacting what’s going on at mid-latitudes,” he says. “It’s not compartmentalized.”

And it’s expected to get worse. The melting of Arctic sea ice is — no pun intended — a snowball effect. The more the ice melts, the faster it melts. In January 2018, the satellite-recorded sea ice levels were the lowest they’ve ever been during early winter.

However, the Arctic sea ice satellite record only dates back to 1979. The next step for Knapp and his team is to gain a broader understanding of these ice levels over a longer period of time.

Once again, alpine larch happens to be the perfect tool. First, it’s a highly responsive species — its rings reflect temperature very well. Additionally, the average tree lives to be 500 years old, with some trees living to be close to 1,000 years old.

Knapp and Soulé hope to dig deeper into the precise relationship between the ring patterns and Arctic sea ice over the known record. They can then use that formula with older alpine larch to develop a proxy sea ice record dating back to the 1500s or even earlier.

“Many scientists suspect this decrease in Arctic sea ice is highly unusual,” he says. “However, creating a proxy record would allow us to really put these conditions into context.”

By Alyssa Bedrosian • Portrait photography by Martin W. Kane  
Learn more at <https://go.uncg.edu/knapp>

## Plastics in the gene pool

For more than a decade, parents have worried about the dangers of disease due to first-person exposure to Bisphenol A, or BPA, an industrial chemical used in plastics and epoxy since the 1960s. But few know that the impacts of exposure can travel onward to future generations as well. And scientists don’t fully understand why or how it happens.

Those are the answers Dr. Ramji Bhandari, assistant professor of biology, is trying to unearth. By using a novel research model, the medaka fish, he’s investigating BPA’s transgenerational effect — how parental exposure alone can cause chemical changes to DNA in offspring and in third or fourth generations and how those changes lead to adult-onset reproductive problems.

According to studies in rats and mice, he says, those reproductive problems include prostate cancer, infertility, polycystic ovary syndrome, preeclampsia, endometrial cancer, and ovarian cancer.

Knowing the impact is paramount because plastic is everywhere. Recent studies, Bhandari says, show measurable concentrations of BPA in all human blood and urine samples. Understanding its effects can unlock how to treat future generations for diseases.

In a developing embryo, chemical signals on DNA tell a cell how to specialize, including the cells that produce sperm and eggs. BPA can alter these signals in developing cells, Bhandari says, and these modifications can be retained throughout our lives. It’s called an epigenetic change. “When sperm and egg pass parental information to offspring, these chemical modifications can go with them and cause health problems later in children’s lives.”

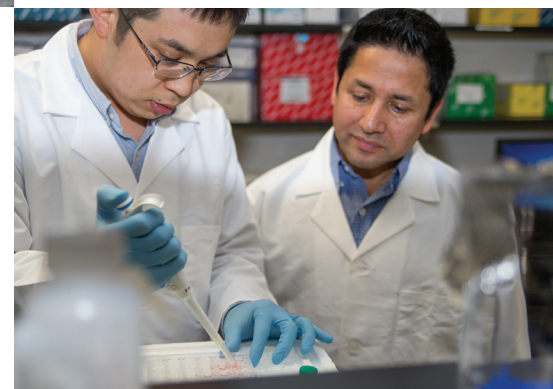
With National Institutes of Health funding, Bhandari’s team tracks the unique epigenetic changes BPA makes on sperm-and egg-producing cells and whether they are passed on to offspring. The researchers continue tracking these markers across three generations, looking at the epigenome at various stages of medaka life, from embryo to adulthood. By comparing the epigenomic history of third-generation fish that develop reproductive problems in adulthood to those that do not, they hope to identify which changes are contributing to reproductive disease.

A major goal, Bhandari says, is identifying biomarkers that point to whether third- or fourth-generation offspring will develop particular conditions in the future. “Not many human studies have focused on epigenetic biomarkers of past exposure and current disease, so we’re hoping to build a foundation to dive deep into this topic.”

The next steps will include looking for the same epigenetic markers in mice, and eventually humans. One day, he hopes the results may even provide insights into disease prognosis and personalized medicine.

“This work is going to be used as the basis for us going forward,” Bhandari says. “It’s a foundation to look at what things to consider when we analyze the effects of exposure to BPA and other chemicals.”

By Whitney J. Palmer • Photography and composite by Mike Dickens • Learn more at <https://go.uncg.edu/bhandari>



**MODEL ORGANISM** Viewing epigenetic changes in mouse and rat models isn’t possible without sacrificing them, which severely restricts multigenerational comparisons. Medaka fish (image right) are an unconventional model, but Bhandari has discovered that they are well-suited for his research. Their sperm and egg cells develop using genes similar to those in mammals, including humans, but they fertilize externally. Using medaka is also advantageous because their embryos are transparent, they spawn daily, and their genome has already been sequenced. Bhandari (image above, right) is conducting his NIH-funded study with postdoctoral fellow Dr. Xuegeng Wang.







## No woman is an island

Dr. Claudia Cabello Hutt often compares her current research project to a Netflix series.

It's full of drama, romance, and world travel. Eight countries, three languages, and six main characters.

The associate professor of Spanish is tracing transnational relationships among female artists, writers, and patrons of the arts who lived between the 1920s and late 1940s. She's focused on queer women — those who rebelled against norms of sexuality, reproduction, and economic dependence — from Latin America, Spain, and the United States, and the networks they built.

Many of these women were expelled from their families or social groups because of their choices. As a result, they built "queer networks of exchange" — groups that, until now, have never been studied. "These anti-institutional spaces have emotional, intellectual, sexual, and economic functions," Cabello Hutt says. "My goal is to theorize how these queer networks function and how they impact the cultural field."

In doing so, she's bringing to light the works and lives of women who have helped shape cultural history — putting them on the map figuratively and literally. Her work will ultimately culminate in a book, but she's also creating a public, digital map tracing people, places, and connections.

Cabello Hutt (image left) first discovered these queer networks while working on her book "Artesana de sí misma: Gabriela Mistral, una intelectual en cuerpo y palabra," or "Artisan of Herself: Gabriela Mistral, an Intellectual in Body and Word." The novel take on the Nobel laureate,

published in March by Purdue University Press, has been highly anticipated in the subject's home country of Chile.

"After Mistral died, the public intellectual side of her was buried and forgotten, and she became heavily idealized — portrayed as perfect, devoted, humble," Cabello Hutt explains. "I try to unpack the myths and misinterpretations. She was very ambitious. She didn't want to dress like most women. She was queer. Her complexity is key to understanding how difficult it is to be a woman in a public space of power."

As part of her research, Cabello Hutt read countless letters between Mistral and other women. She saw the ways in which Mistral was supported by her peers, and how Mistral supported others — from sending money to helping women find jobs and lodging. "I realized the power of networks in the equation of 'making it,'" she says. "You need to have allies around, especially if you're doing things differently."

So, two years ago, as she finished her book on Mistral, she revisited the letters she had flagged and began a transdisciplinary, travel-heavy, logistically complicated project involving hundreds of unpublished letters, press clippings, photos, ship records, and interviews with descendants.

The research will serve as a resource for scholars in the fields of cultural sociology, art history, literature, and gender studies. It will advance the study of networks, and it will unearth stories of women who shaped literature and art — especially those who worked "behind the scenes."

"Whenever we achieve something of importance, we never achieve it alone. We're always working with others," she says. "Often, the people who are not named are women and minorities. I'm especially interested in these individuals — those who enable the work. We need to talk more about them."

By Alyssa Bedrosian • Photography by Martin W. Kane • Learn more at <https://go.uncg.edu/cabellohutt>



## From Chile, with love

When Maria Gonzalez, board chair of FaithAction International House, attended the 2017 performance of "Nómadas" at UNC Greensboro, she witnessed a dramatic change in the audience from before the opening scene to after the final curtain.

"Some people were like, 'I don't speak Spanish. What if I don't understand what they're saying?'" she says. "After, everybody was like, 'This was amazing, and they didn't even speak!'"

That kind of reaction is why Rachel Briley went to extraordinary lengths to bring "Nómadas" to Greensboro. The associate professor of theatre first saw the play at the 2017 Santiago a Mil International Festival in Chile, which she attended as a delegate of the U.S. Theatre Communications Group.

"I fell madly in love with this play," says Briley, who is head of UNCG's MFA program in Theatre for Youth and artistic director of the North Carolina Theatre for Young People.

"Nómadas" is Spanish for "The Nomads," and the dialogue-free play shows people entering and leaving each others' lives. It is, by turns, heart-wrenching and funny, Briley says, combining physical movement with fanciful objects and large-scale puppets.

**CHILDLIKE VS. CHILDISH** For Briley, bringing international theater for young people to the U.S. is about more than entertainment. It's a way to advance the field. "The cultural construction of the child in North America is so vastly different from other parts of the world," Briley says. "In many places, childhood is respected in a different way — the art created for young people elevates the entire human condition because it honors the child. We can do this here too."

"It's about exile, loss, love, and relationships," Briley says. "It's about what we gain when we go places, what we lose when we leave."

Convincing the play's creative team — theater company La Llave Maestra — to bring it to North America for the first time was easy. Getting them here was more difficult.

The U.S. Embassy in Santiago awarded \$20,000 to fund the production, then reversed its decision after a new administration took over in Washington. The deficit was bridged via a UNCG Faculty First grant, a grant from the Children's Theatre Foundation of America, and contributions from UNCG departments and individuals. Local business owners and individuals also chipped in with free meals and lodging.

Everything came together in the end. Local nonprofits helped extend performance invitations and provide tickets to immigrants in the community, representing more than a dozen countries. Seating was arranged to bring together people from diverse cultures, many attending a theater performance for the first time.

The company followed the performance with a three-week residency at UNCG. The Chileans collaborated with professors and led workshops for students, sharing skills and methodology. "I still cannot believe how much I learned in such a short amount of time," one student wrote.

Briley has already begun work on bringing La Llave Maestra back to present a new play, possibly drawing inspiration from their Greensboro experiences. The response to "Nómadas" convinced her that the hard work was worth it, including a student email that moved her to tears.

"Last year I decided that I didn't want to do theatre anymore," the student wrote. "But after seeing 'Nómadas' and working with La Llave Maestra, I have never been more inspired."

By Eddie Huffman • "Nómadas" performance photo by Michael A. Gálvez  
Learn more at <https://go.uncg.edu/briley>





type of program makes it more mobile – you don't have to go to China to interact with a Chinese principal."

Dr. He (image right) hopes that UNCG's partnership with the Jack Ma Foundation will lead to long-term engagement. She and her colleagues are collecting data to assess the collaboration's success. Thus far, they have seen a large increase in participants' willingness to take risks. Participants said they felt comfortable sharing thoughts and ideas, despite any language barriers, and expressed interest in continuing professional development.

"We have found so far that generally the principals are very satisfied with our preparation and our program, and their experiences here," Dr. He says. "Overall there is an increase in all aspects of knowledge – in terms of language, history, cultural customs, and the education system of the U.S."

Tingting Huang, project manager for Jack Ma's Rural Headmasters Initiative, says the visit exceeded expectations.

"What we have learned here can be directly used to guide how we're going to work on school improvement plans. We hope that in the future there is more collaboration between the foundation and UNCG, and I believe that will happen."

*By Elizabeth L. Harrison • Photography By Mike Dickens • Learn more at <https://go.uncg.edu/TeacherEducation>*



## THE WORLD IS YOUR CLASSROOM

It was an uncommon scene in a small classroom in Randolph County: Four headmasters from rural China seated with a group of enrapt middle-school students, discussing education policy and Southern barbecue.

These Chinese educators, and 14 of their counterparts, spent eight days reflecting with school leaders in some of North Carolina's most rural counties.

Dr. Ye He, associate professor in UNC Greensboro's Department of Teacher Education and Higher Education, helmed the visit.

"To prepare global-ready students and lead global-ready schools, educators need to participate in intercultural exchanges," Dr. He says.

Her mission as a teacher educator is to engage teachers at the local and international level. She emphasizes strengths-based, diverse-language, and culture-centered teaching.

"It's not about who is learning from whom," she says. "We all have our various strengths and utilize them in different contexts."

He's headmasters project is funded by the Jack Ma Foundation, an organization created by the executive chairman of the world's largest retailer, Chinese e-commerce company Alibaba Group. One focus of the foundation is the promotion of leadership and management skills for headmasters in rural China.

The foundation chose UNCG as its international partner because of the university's successes in working with rural educators, including the recent Principal Preparation for Excellence and Equity in Rural Schools initiative led by the School of Education's Dr. Kimberly Kappler-Hewitt. With \$1.8 million from the NC Alliance for School Leadership Development, the initiative is helping 11 North Carolina school districts that are struggling to find and keep effective principals in high-needs schools.

Through the headmasters project, the Jack Ma Foundation aims to enhance management of schools and programming in rural China by broadening headmasters' scope of knowledge. At UNCG, the goal is to provide North Carolina rural principals and teachers with opportunities for global engagement.

"Depending on the resources you have, students may never have the opportunity to really go to China," Dr. He says. "But this

**Dr. He, in conjunction with Dr. Kristine Lundgren in the Department of Communication Sciences and Disorders, also recently completed a U.S. Department of Education-funded project that took 12 N.C. educators abroad for an intercultural program in China. The educators spent four weeks in China, observing K-16 classes, partnering with Chinese teachers, and more. Upon their return, participants designed curriculum activities based on their experiences for their students.**

### A GLOBAL, LOCAL EDUCATION

In the United States, the English Learner population constitutes 9.1 percent of the K-12 student population. Yet English as a Second Language (ESL) and bilingual education teachers make up just 2 percent of K-12 teachers, according to the National Center for Education.

Dr. He says some estimates predict we will need to increase the ESL and bilingual education teaching force by 34 percent.

"In North Carolina, we have a growing number of students with multilingual backgrounds," she says. Between 2004 and 2014, the state's English Learner population increased by 36 percent.

"It's important we provide opportunities to not only learn the English language but to develop bilingually."

With a recent \$2.5 million grant from the U.S. Department of Education, Dr. He is rising to that challenge.

Her Engaging and Advancing Community-Centered Teacher Development project, or EnACTeD, is a partnership among UNCG and Guilford and Forsyth county schools.

The project uses a community-centered approach and aims to engage teacher educators, teacher candidates, families, and community partners.

Over five years, He and her colleagues will provide professional development for educators working with English Learners, develop a new academic concentration for preservice teachers and a similar add-on program for in-service teachers, and implement ESL classes, workshops, and

activities for families.

The project is already making progress, with planning team meetings and strong participation by the N.C. Department of Public Instruction and school districts.

"It's 'glocal' engagement," says He. The participants and language may be international, but the activity and impact are local.

Dr. He sees bilingual education impact as far-reaching.

"Learning another language empowers you to communicate and expand your collaboration with others."

Students who are prepared to be more globally aware, she says, will understand how to influence the world.



# MUCH MORE THAN NUMBERS

*Dr. Sat Gupta is a professor of statistics. With more than 125 journal articles, the Senior Research Excellence Award winner is both an accomplished theoretical researcher and statistical consultant, applying his expertise broadly and collaborating with researchers in disciplines as diverse as biology, education, nutrition, anthropology, economics, public health, psychology, and medicine.*

*Gupta, who is the founding editor of the Journal of Statistical Theory and Practice, has received funding from agencies such as the National Science Foundation, National Institutes of Health, Mathematical Association of America, and Robert Wood Johnson Foundation. Last year, he was named a Fellow of the American Statistical Association, the highest professional recognition in his field.*

## BROAD IMPACT

"I'm a statistician. Although my core research at this point is in the branch of statistics called survey sampling, I do non-survey work also — teaching, consulting, and working with researchers in many other disciplines. In recent years, I've appeared in many court cases on behalf of the North Carolina Division of Medical Assistance. In these cases, I basically explain to judges why the sampling approach the State is using is reasonable and based on proper statistical techniques."

## ESTIMATING SENSITIVE HUMAN BEHAVIORS

"The biggest impact I've had would be the introduction of optional RRT models. That, I suppose, will be my legacy. The term RRT means 'randomized response technique.' In this technique, in a survey question, you have respondents give you a randomized response, or a scrambled response, rather than a straightforward response. Why would you do that? Well, the survey question could be so personal that if you ask the respondent to give you a correct, emphatic response face-to-face, they may refuse to answer — which is bad enough — or worse still, they may give you a socially acceptable lie. Think: 'Have you ever cheated on taxes?' My breakthrough work on this appeared in the Journal of Statistical Planning and Inference in 2002. It established optional RRT, where survey participants have an additional choice of providing an accurate, non-scrambled response if they don't find the research question embarrassing."

## A BREAKTHROUGH FOR GREATER ACCURACY

"With optional RRT, a researcher will not know if a particular participant provided an unscrambled response. However, the pool of survey answers now contains unscrambled responses as well as scrambled responses, which, with correct modeling, allows the researcher to estimate the average response to the research question with greater accuracy. There's better precision. I've written many papers related to it. All my PhD students, by and large, have worked on optional RRT models. It opened up a new area of research, not only for my students but for many other researchers. We have shown that these optional models can be used in the field and that they work very well. With any RRT model you can think of, there is going to be an advantage in using the optional version of that model."

## REAL-WORLD APPLICATIONS

"I enjoy collaborating. For example, I did a study with nurse researchers at Cone Health that won the Association of periOperative Registered Nurses Journal Writers Contest award in 2017. That study was about patients who develop bedsores after surgery. Another recent one was with the School of Nursing, looking at the negative impact of presentism on patient care and the economy. Now we all know what absenteeism is. You are absent from work. But presentism is: you are present at work, but you're not really working. Maybe you're in pain or experiencing depression. Nurses who are suffering with depression or pain often end up making mistakes. Baseline cost estimates indicate the increased falls and medication errors caused by presentism cost \$1,346 per North Carolina registered nurse and just under \$2 billion for the United States each year."

"That joy in collaborating extends to my work with graduate and undergraduate students. Undergraduates don't have to do research, so motivating them to do that work is particularly satisfying. My undergraduates have published RRT papers about stimulant use among college students, STD prevalence, and more. Many have gone on to graduate work, both here with me and at other outstanding programs across the country. One of the most rewarding things is seeing these students progress in life."

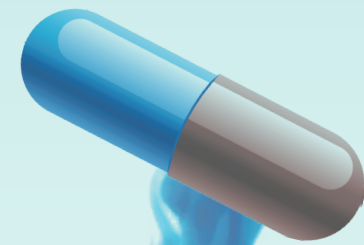
"I also enjoy consulting. In one case, I represented a biotech company whose product was rejected by the FDA. We convinced the FDA the approach they used to test compliance of certain diagnostics devices needed modification."

## HELPING PEOPLE IN A REAL WAY

"With each research project, I try to understand the underlying story as much as possible. For example, with the bed sore study, those nurse researchers are better educated now as to what can lead to a problem, and they can take better action. In another study, we tried to figure out how to reduce the use of narcotics after caesarean deliveries at Cone Health. We learned that mothers who breastfed their babies felt less need for narcotics compared to those who did not breastfeed. It's called skin-to-skin therapy. This was a very recent study, but the fact that it has concrete implications is very satisfying. One of my graduate students was part of that study. She won the best paper award at a conference in India for the work, and she presented it at a conference in Boston. From a research point of view, those are exciting things. But when you can understand the underlying story, you feel even more excited, because this research has a direct impact on people's lives."

Interview by Mike Harris • Photography by Mike Dickens • Learn more at <http://go.uncg.edu/gupta>





## Water, water everywhere

### Austin Gray, graduate researcher

Environmental Health Sciences PhD student Austin Gray hails from Charleston, South Carolina, a harbor city nestled among three rivers. Considering his hometown's relationship with water, it's no coincidence it became his academic focus.

Gray started as pre-med at The Citadel, but when a work-study position put him in an aquatic toxicology lab, he was hooked.

"I saw that environmental health and human health are intertwined," he says. "The importance of water quality amazed me."

In Charleston, where seafood is central to the culture and floods are often possible, it was easy for him to see the health consequences of contaminated water or a compromised aquatic environment.

While a master's student at The Citadel, Gray researched aquatic estuarine areas, green products, and microplastics — tiny plastic pieces that can threaten aquatic life. His lab's research, shared through town meetings, even led to the banning of plastic bags by several South Carolina towns and beaches.

Gray came to UNCG to work with Morton Distinguished Professor Anne Hershey, whose scholarship on urban streams caught his interest. He wanted to design a project that examined stream ecology and pharmaceuticals.

"It was aquatic research, but with a completely different focus. I knew working with her would add to my skill set and allow me to become a better scientist."

During his first year as a doctoral student, Gray received a UNCG O'Brien Award for Ecological Field Research to investigate antibiotics in urban streams of Greensboro. With a biology department grant, he also initiated work in North Buffalo Creek, near campus.

Subsequently, through Hershey's lab and a fellowship from NC Sea Grant and the Water Resources Research Institute of the UNC System, Gray has conducted research investigating antibiotic pollution in North Carolina rural streams and drinking wells in three counties.

Gray contacted residents of Guilford, Randolph, and Alamance counties to sample their drinking wells. He also sampled 17 streams in the Piedmont of North Carolina, looking at both human antibiotics, typically found in urban areas, and veterinary antibiotics, often found in rural areas and close to farmlands.

The project's findings could be crucial, not only for determining the health of water environments but also in demonstrating just how widespread antibiotic pollution is throughout the Piedmont.

As Gray explains, if humans are exposed to trace amounts of antibiotics through drinking water, that can have adverse effects. One is that those exposed may become resistant to the antibiotic, rendering it ineffective in treating diseases and infections.

"There is also concern that antibiotics in the water can change microbial functions, which play key roles in the nitrogen cycle, carbon cycle, and methane cycle," Gray says.

Improper disposal of these products is what leads to their appearance in our water, and Gray has observed that instructions about responsible antibiotic disposal are not widely available.

He has been seeking to remedy that problem by sharing information at local community meetings, public schools, universities, outreach groups, and conferences such as the Society for Freshwater Science and the Society of Environmental Toxicology and Chemistry. He hopes his research will influence both individual behavior and land use decisions.

"We do play a role in our environment's health," he says. "And there are steps we can take to protect it from antibiotic pollution."

By Susan Kirby-Smith • Photography by Mike Dickens • Learn more at <https://biology.uncg.edu>

## A common language

### Martha Reyes, undergraduate researcher

Martha Reyes can't help but feel a special connection to students whose first language isn't English.

Reyes, whose family is from El Salvador, spoke Spanish at home. Although she was U.S.-born, her English grammar wasn't perfect. So, her Charlotte elementary school teachers recommended her for English as a Second Language, or ESL.

The message was clear: English only. The thought was that English comprehension improves by discouraging the first language. When a student who only spoke Spanish joined Reyes' class, her teachers relied on her as interpreter. Only then was Spanish allowed.

Reyes, who came to UNCG for its School of Education, is anxious to return to her alma mater to teach second grade when she graduates in May. She's especially eager to help those in her classroom who are learning English. That's because she's observed that attitudes and approaches in teaching English language learners, or ELLs, have changed little since she was a child. Even as student populations become increasingly diverse, most teachers are still at a loss in helping ELLs.

Reyes' research with Dr. Jamie Schissel, assistant professor of teacher education, may help change that. As a former ESL teacher, Schissel has observed how traditional assessment practices can hinder learning and has focused much of her research on the integration of multilingual approaches into instruction and assessment, particularly for language classes. "Making use of learners' multilingual resources holistically," she has found, "is beneficial for language learning."

Reyes first worked with Schissel on a project about integrating multilingualism into teacher education. Her analytical skills impressed Schissel so much, she asked Reyes to co-author a manuscript, now under review. Since then, they've begun another paper and presented at three conferences.

Last fall they traveled to Mexico, to examine multilingual approaches to classroom language assessments at the Universidad Autónoma Benito Juárez de Oaxaca. Reyes took part in an ongoing collaborative project with Oaxaca English instructor Julio Morales and his students.

Reyes observed Morales' classes and interviewed students who spoke numerous Indigenous languages, in addition to Spanish and English. "Oaxaca is among the most linguistically diverse areas in Mexico, but speakers of Indigenous languages remain largely stigmatized," she explains. "I conducted the interviews in Spanish, and I felt as though because we shared a common language, the students were more comfortable speaking with me."

Students discussed their use of different languages in and out of the classroom and how that helped them learn English. Using Indigenous languages, they said, helped them with English pronunciation when there were phonetic similarities. It also helped when Morales used Spanish and English to clarify certain concepts.

"Mr. Morales' multilingual approaches — rooted in honoring local knowledge traditionally excluded from the classroom — impact teaching and assessment in his class every day," says Schissel.

Reyes believes U.S. teachers could better help ELL students by learning multilingual approaches through professional development.

"Sometimes I see that they don't know what to do, so they just kind of ignore that they have a bilingual student who needs help," she says. "Kids are pulled out for ESL instruction, but they spend the majority of time with the classroom teacher."

Now Reyes can use her research discoveries in her own classroom — and share them with her colleagues.

By Tina Firesheets • Photography by Mike Dickens • Learn more at <https://go.uncg.edu/TeacherEducation>







# TO BOLDLY GROW

Basic research conducted by UNCG scientists could help humans travel farther in space, live on the moon or Mars

WHEN JOHN Z. KISS WAS NINE YEARS OLD he stayed up late to watch Neil Armstrong take those first steps onto the surface of the moon and tell the world, “That’s one small step for man, one giant step for mankind.”

“My life is sort of the space era,” says Kiss, a professor of biology and dean of the UNC Greensboro College of Arts and Sciences.

But there’s no way he could have known in 1969 that he would one day do research that could help humans take longer space flights and live on the moon or Mars.

Kiss is not a rocket scientist. But he’s one of a small cadre of space biologists, scientists who study how living systems function beyond the Earth’s atmosphere.

Kiss has devoted more than 25 years to understanding what happens to plants in space. It’s critical work because, as NASA and other space agencies around the world plan for potential bases on the moon, interplanetary flights, and putting humans on Mars, plants will be essential.

In the sealed environment of a spacecraft, space station, or extraterrestrial base, plants could help turn carbon dioxide exhaled by astronauts back into oxygen they can breathe in again. They could also produce food — essential when the nearest grocery store is back on Earth, hundreds of thousands or millions of miles away.

“Everything I’ve done has really been basic research in plants,” Kiss explains. “We pursue basic discoveries, and some of them will have practical benefits in the long term.”

Kiss’ work could also have earthly benefits. By studying how plants respond to the stresses of space, for example, we could gain insights that help us understand how we might help plants adapt to stresses such as climate change here on Earth.





### AMBASSADOR FOR SPACE SCIENCE

Kiss has been an outspoken advocate for NASA and its research and exploration mission. In 2014, he was awarded NASA's Medal for Outstanding Public Service for both his research accomplishments and his outreach and advocacy on behalf of NASA's work. That advocacy includes speaking to the media and giving talks to civic clubs, school groups, and other organizations.

Kiss has also sat on advisory panels for NASA and the European Space Agency, reviewed proposals for the Italian Space Agency, and spoken at a symposium organized by the Japanese Space Agency. He is the former president of the American Society for Gravitational and Space Research.

In his spare time, he reviews popular books about space exploration and space history.

But as the speed of the centrifuge — and hence the G-force — increases, these responses switch off. At around 0.3 G, the plants behave like they do on Earth.

Why does that matter? Because the moon's gravity is about 0.17 G, so these unusual phototropic effects would apply to plants grown there. But Mars' gravity is stronger — about 0.38 G — above the level at which these phototropic effects switch off.

"The gravity on Mars is probably enough for these plants to grow like they would on Earth," Kiss says. "But on the moon, it wouldn't be enough."

That might suggest different designs for cultivation systems developed for the moon, for Mars, or for a long-range spacecraft, like that which would be needed for the months-long voyage to the red planet.

There's plenty more work to be done. There are other types of tropisms, such as hydrotropism — growth toward water. And different species can exhibit different tropistic behaviors. Sunflowers, which Vandenbrink studied earlier in his career, turn themselves overnight to face east in the morning when the sun rises.

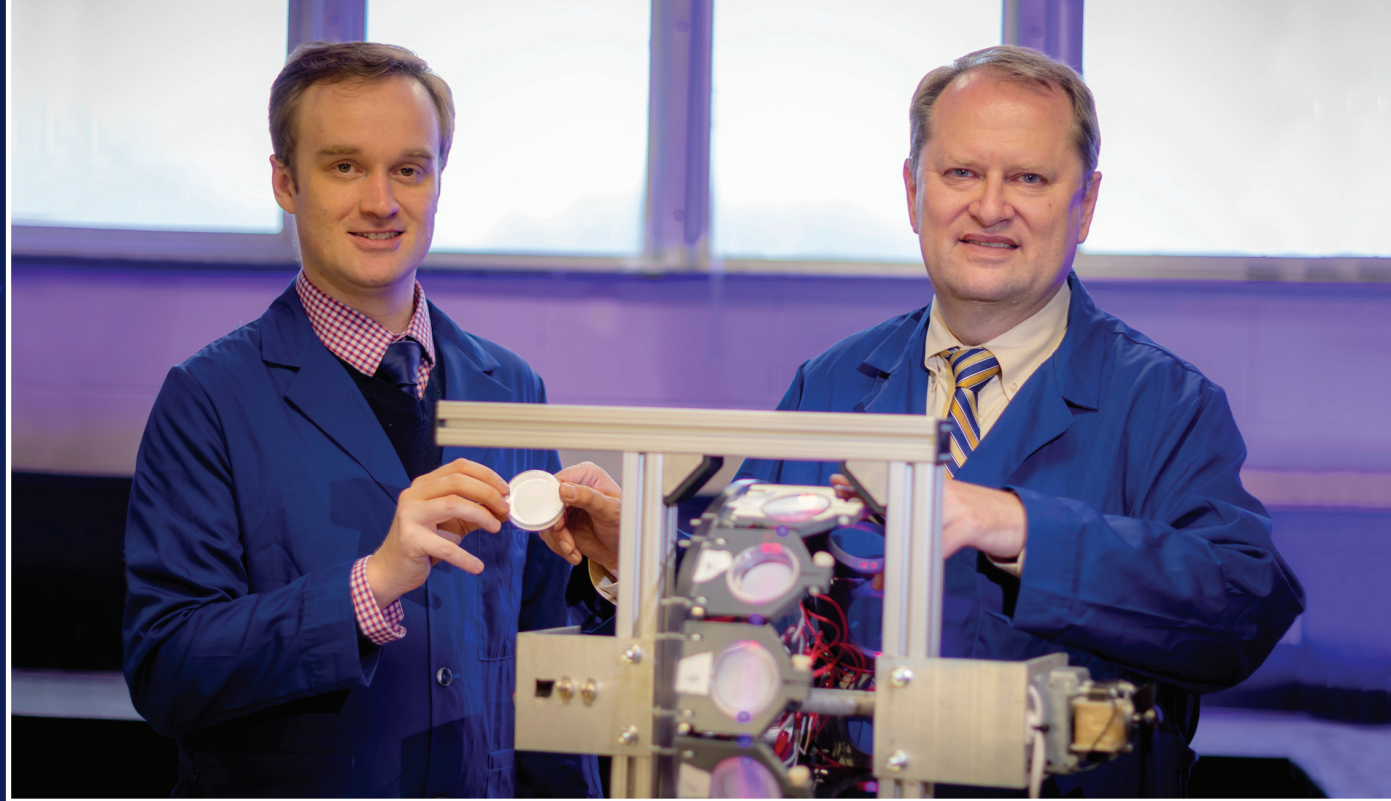
Understanding the genetic and physiological components underlying tropisms provides a rich vein for research.

"I think there are other potentially important discoveries we can make in microgravity," Kiss says. "There's this sense of discovery, that's part of why we do it."

And ultimately, he says, "I would argue that space will maybe help us solve some of the longer-term problems on Earth."

For that to happen, humans will have to continue to explore "the final frontier," going farther and staying longer. And we'll probably take plants with us.

By Mark Tosczak • Images courtesy of NASA, with portrait photography by Martin W. Kane • Learn more at <https://go.uncg.edu/kiss>



**HERE ON EARTH** Kiss and his colleagues have been involved in nine NASA space shuttle missions and five NASA-contracted SpaceX missions. Above, postdoctoral researcher Josh Vandenbrink and Kiss (l-r) load samples onto a clinostat, a device that simulates microgravity and helps them analyze results from spaceflight experiments.

The UNCG biologist has focused on plant physiology and how plants respond to environmental cues. This is an important question for space research, because important plant stimuli, such as gravity and light, can be different off-Earth. Knowing how plants will or won't grow in those environments is the first step to actually growing plants as part of life support systems in space.

Since 1997, Kiss has led or co-led experiments where plants ride into space on rockets and are then exposed to different environmental stimuli. His most recent extraterrestrial experiment was in the summer of 2017.

### LIGHT AND GRAVITY INTERACT

One of Kiss' most striking discoveries has implications for growing plants on other worlds. It also sheds light on how evolution has changed the way the plants respond to their environments.

Two of the most important environmental stimuli for plants are light and gravity.

Generally, plants grow toward light sources. Put a potted plant on a window sill and you may find it takes on a distinctive curved profile as it grows toward the light. This tendency is called phototropism.

Likewise, plants respond to the force of gravity. Generally, roots grow down toward the gravitational pull, shoots and stems away from it.

There are subtle interactions between these two tendencies that would be nearly impossible to detect on earth, but which have come into sharp focus in the microgravity environment of low Earth orbit.

Kiss and his collaborators send hundreds of tiny seeds into space, to the International Space Station. Once there, they're placed in a centrifuge and cultivated. As the seeds sprout and become

seedlings, they can be spun at different speeds in the centrifuge to simulate different levels of gravity — such as the levels on the moon and Mars — to assess how they respond. If the centrifuge is off, then the young plants are in a microgravity environment.

On Earth, when flowering plants grow toward light, they're responding to the higher frequency, blue wavelengths. Shine a red light on a flowering plant, and, although it can use that energy for photosynthesis, it won't grow toward the light source.

It turns out, this bias toward blue light is switched off in low gravity environments. In lower gravity, Kiss' plants would also grow toward red light.

"That was really an amazing discovery," Kiss says.

### DECODING GENETIC SECRETS

The switch is likely based on mechanisms deep in the plant's genetic code that could go back some 140 million years, when the earliest flowering plants evolved an affinity to blue light. That affinity may relate to the refraction of light through Earth's ancient atmosphere, which was quite different millions of years ago compared to today.

Understanding the genetic component of these tropisms is one of postdoctoral fellow Josh Vandenbrink's interests. He helps run Kiss' lab and is a geneticist by training. He's focused on "looking at the genes that are turned on and off in space."

In one of their International Space Station experiments, Vandenbrink and Kiss discovered that it's not just the phototropism of shoots that's altered by different levels of gravity, but also how plant roots respond to light.

On Earth, roots usually grow away from blue light. After all, if they're receiving high energy blue light, chances are they're not in the ground, where they're supposed to be. But Kiss' experiments in

the last few years have found that in very low levels of gravity, roots, too, will grow toward blue light.

"As you slowly turn up gravity, that reaction will turn off," Vandenbrink says. "[Plants are] looking at light and gravity ... integrating the signals, then deciding which way to grow."

When these plants were returned to Earth, Vandenbrink used a technique called RNA sequencing to identify which genes were being turned on and off. That, in turn, sheds light on how different components of a plant's DNA control phototropic and gravitropic activity, and perhaps other types of tropism, too.

It also presents an interesting genetic mystery. "It's very puzzling to me that you can see some different responses in these plants when there's never been a gradient of gravity for them to experience," Vandenbrink says.

### GROWING PLANTS IN SPACE

Unlocking these genetic and physiological components that control tropisms will help scientists better understand how and why plants grow the way they do — whether on Earth or on a space station.

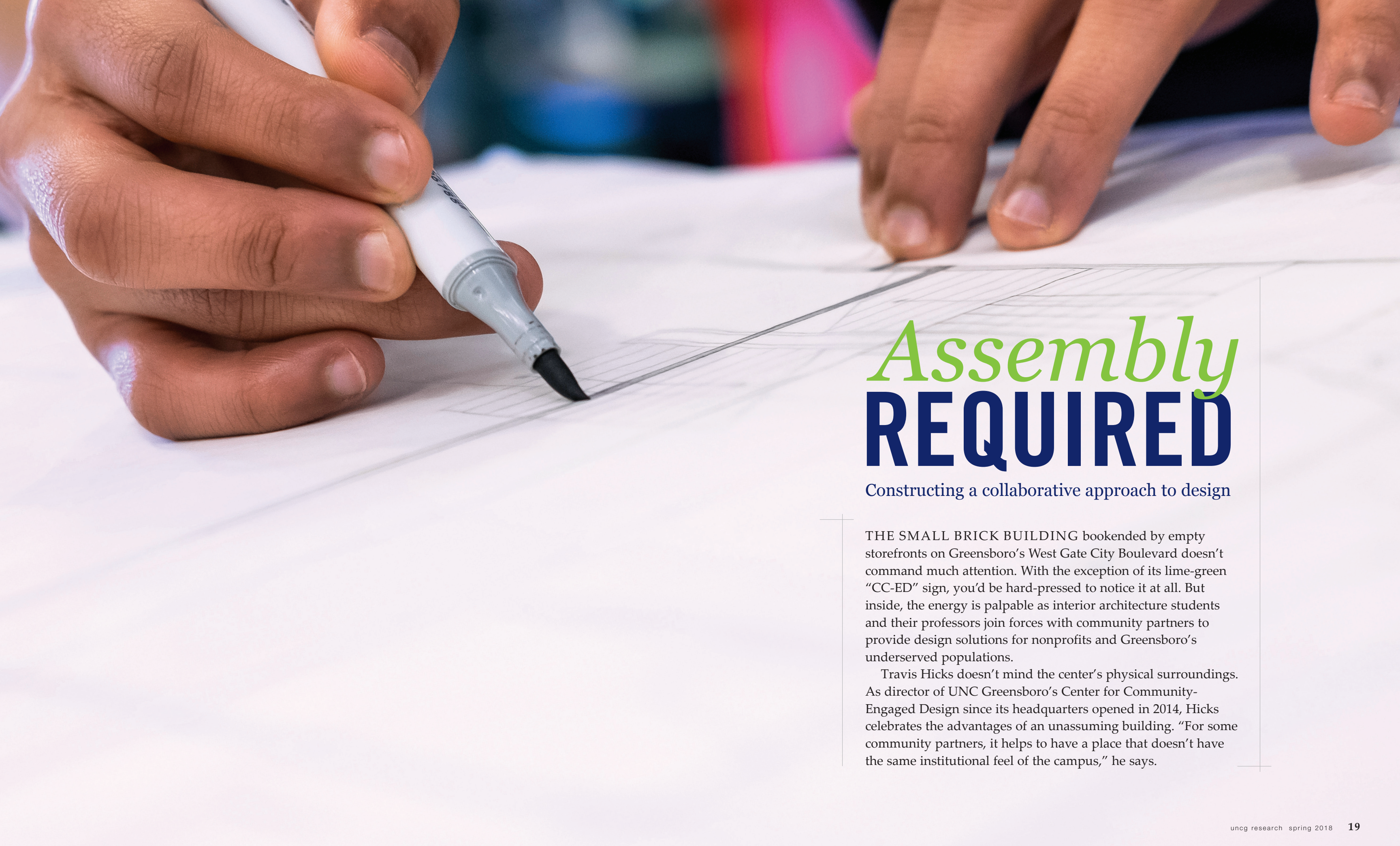
The research has implications for how we grow plants in different off-Earth environments.

The phototropic changes Kiss has identified are seen in low-gravity environments, like the near-zero gravity of the space station.



**GOING UP** In a NASA lab prior to launch, cassettes are filled with *Arabidopsis thaliana* seeds (lower left). With a rapid life cycle and fully sequenced genome, the flowering weed is a model organism for plant biology research. The seeds are allowed to germinate on the International Space Station (lower right). Above, NASA astronaut Tom Marshburn retrieves an experimental container of seedlings, to be frozen and returned to Earth for further study.





# *Assembly* **REQUIRED**

Constructing a collaborative approach to design

THE SMALL BRICK BUILDING bookended by empty storefronts on Greensboro's West Gate City Boulevard doesn't command much attention. With the exception of its lime-green "CC-ED" sign, you'd be hard-pressed to notice it at all. But inside, the energy is palpable as interior architecture students and their professors join forces with community partners to provide design solutions for nonprofits and Greensboro's underserved populations.

Travis Hicks doesn't mind the center's physical surroundings. As director of UNC Greensboro's Center for Community-Engaged Design since its headquarters opened in 2014, Hicks celebrates the advantages of an unassuming building. "For some community partners, it helps to have a place that doesn't have the same institutional feel of the campus," he says.



**UNIQUELY QUALIFIED** Hicks began his career working alongside world-renowned architects Michael Graves and Phil Freelon. The work was challenging, he says, involving teams of people from different disciplines collaborating on difficult, large-scale “puzzles” of building designs. But, he says, the CC-ED is just as complex. “The number of design professionals involved is fewer, but the number of community stakeholders is higher.”



**AT HOME IN THE COMMUNITY** As CC-ED director, Hicks facilitated more than 10,000 hours of public service in the past year alone. The CC-ED has provided fellowships for more than 40 students and has engaged in over 30 projects, ranging from the Glenwood Grove Mural to home renovations for Community Housing Solutions. Above, Hicks works with graduate student Jessica Ocasio.

Plus, the associate professor of interior architecture knows good design starts from within. The most basic element of a building isn't a brick; it's the person who uses the building. So when Hicks and his students partnered with Peacehaven, a working farm for adults with developmental disabilities, to design a new community center, they started by talking with the residents. And when they partnered with Tiny Houses Greensboro, an organization committed to reducing homelessness, they began with a Greensboro citizen who needed a home.

“The concept of community-engaged design is a new and rising force in interior architecture,” says Hicks, who is certified as both an architect and interior designer and practiced 13 years in the professional realm before coming to UNCG in 2009. In his previous career, Hicks worked as lead design architect on large-scale projects ranging from office buildings to courthouses and schools — with little to no collaboration with the end users.

“We would work with maybe a couple of specialists here and there. But we rarely consulted the people who would have worked in or occupied those public projects,” Hicks says. “That’s not what the CC-ED is about. We want to bring our students and practitioners together with the people who will occupy and live in these spaces.”



**COMMUNITY CENTERED** Buck Cochran (above center), the CC-ED team, and representatives from a local architecture firm tour Peacehaven and discuss the next steps in turning the community center vision into reality.

### A PARTNER IN PEACEHAVEN

There's more to interior architecture than picking out paint colors and accessorizing. Students in UNCG's Department of Interior Architecture are exposed to building structures and to electrical and plumbing systems. They learn about sustainable design for historic preservation and dive into public-interest design, where issues like low-income housing and energy efficiency are front and center. Through the CC-ED, they put these ideas into practice working with community partners needing real and immediate solutions.

One of these partners is Peacehaven, a working farm with rolling hills and lush woodland in Whitsett, North Carolina. As Peacehaven grew from a plot of land in 2007 to a home for four residents with developmental disabilities — plus a long wait list of people needing services — co-founder Buck Cochran realized a need for a community center where Peacehaven's residents, service providers, and volunteers could gather.

“We have so many trusted partners at UNCG, including social work interns who perform essential programming and training for our residents. They needed a place to perform that training,” says Cochran. “We went to Travis Hicks and said, ‘Hey, this is what we're thinking. Can you help us think about what type of structure would fit with this farm vernacular?’”

Cochran was blown away by the CC-ED's approach.

“They started by listening,” Cochran says. “Then they asked clarifying

questions, ones that may challenge you a little in your thinking. And they were able to combine a lot of different ideas in a way that was really meaningful.”

Not only did the students' brainstorming sessions include Cochran and other members of the Peacehaven leadership team, they pulled in residents and their caretakers to better understand how the space would be used. “I'm afraid when most people think about folks with disabilities, they discount the value they could bring to this process,” Cochran says. “But when you create the right setting, those ideas will come.”

When Peacehaven's new community center is constructed, its residents will recognize many of their ideas. “Folks on the autism spectrum can be overwhelmed by a large space,” Cochran says. “Because of the input from our residents, Hicks and his students carved out smaller spaces in the community center where residents could go to find respite from larger group activities, if they need a retreat.”

Cochran sees the CC-ED as an economic catalyst for the broader community. “They're an unbelievably important resource. We don't have the capacity to generate these things on our own, but they got us to a point where we could see their plans to fruition. We're now able to hire builders who will bring it to life,” Cochran says.

Not to mention the impact a project like this has on the students, he adds. “Soon, they will drive down the road, point to a new building and say, ‘I designed that, and it is having a positive impact on my community.’ That is incredible real-life experience.”



*“I originally chose UNCG because it’s one of the few programs that offer an MFA in interior architecture in the state,” says Ocasio. “When I looked into the program, I realized how holistic it was and how many opportunities it offered.”*



### TINY HOUSE, BIG IMPACT

Hicks and his students understand that sometimes big projects come in small packages. In her last semester as an MFA candidate in the interior architecture department, CC-ED student fellow Jessica Ocasio accepted a design internship that would allow her to use her skills to transform people’s lives. As the summer intern with Tiny Houses Greensboro, or THG, a young nonprofit committed to reducing homelessness by building affordable and permanent tiny houses, Ocasio received an extraordinary challenge: to design their first tiny house, which would serve as a blueprint for five homes in a new tiny house community.

“Working at the CC-ED, I’ve learned the importance of partnering with the community — not just designing something and imposing it on them,” Ocasio says. “As designers, we shouldn’t assume we know what’s best.”

Ocasio applied that principle as she set about designing a 288-square-foot home with a kitchen, bathroom, and bedroom. “One of the board members of Tiny Houses Greensboro is experiencing homelessness, and I got feedback from him,” Ocasio says. She also listened to advice from colleagues at THG, who worked directly with homeless people and understood the features required for a sustainable dwelling space.

“I’d first envisioned designing a loft for the bedroom in order to maximize the vertical space a tiny house would have,” she says. “But something I learned is that people who are living in these spaces want to feel like they have a home they can call their own. So, things like including a closed-off bedroom, even if it is a smaller space, gives them that feeling.”

THG broke ground on the community last summer. “Seeing it being built is surreal,” Ocasio says. “Just last week, I made some adjustments to that original design, and now the new version is being used to get permits for the last three houses in the community.”



**GROUP EFFORT** Volunteers, Ocasio (above), and other CC-ED fellows and alumni help with construction of a new Tiny Houses Greensboro community. CC-ED students were also at the table in the organization’s early days, participating in the development of THG’s vision and strategic planning.



### MILLENNIALS AND MICRODWELLINGS

When Ocasio accepted a summer internship with Tiny Houses Greensboro, she never expected she’d design the prototype for the organization’s first six-house community. The experience went hand-in-hand with her thesis, where she’s studying microdwellings — tiny houses, included — and how these spaces could be better designed to fit the lifestyle of millennials.

“Millennials are looking for a sense of community. They want their own space and privacy, but it’s also important to them to be a part of a bigger community where there’s walkability and connectivity,” she says. These spaces are often found downtown, where spacious — and expensive — loft apartments are the growing trend.

“Young adults should be our economy’s biggest group of first-time homeowners or renters, but since the recession, that financial activity has decreased because it’s no longer affordable,” says Ocasio, who believes microdwellings are a great solution to millennials’ housing needs. In addition to tiny houses, Ocasio explains, microdwellings encompass microunit apartments and accessory dwelling units — additional residences on existing properties, such as garage or basement apartments.

“People in their 20s tend to be more transient, so offering them a small space that they could rent for a while and then easily move out piqued my interest.”

Ocasio is working to identify a set of design elements that could be incorporated in microdwellings to make them more attractive to millennials — features like a table that folds out from the wall or transformable, modular furniture like couches that turn into sofa beds. “You also want to maximize the natural light and utilize all your vertical space,” she says. “It’s all about giving people a space that is comfortable — a place they can call home.”

*“The CC-ED is the first community design center to be housed in a department of interior design or interior architecture,” says Hicks.*

### FROM THE GROUND UP

As part of the design process, Hicks teaches his students how to talk to their end users to get their input. There’s not a single formula with a guaranteed outcome; some creativity is required.

As a student fellow at the CC-ED, UNCG senior Elizabeth Graves remembers a project with Greensboro’s Cottage Grove community. The neighborhood had a vacant outdoor space atop a former landfill, and Graves and her peers were tasked with recommending landscaping and design improvements.

The CC-ED already had a strong relationship with Cottage Grove residents. Under Hicks’ leadership, students had helped to design a new Mustard Seed health clinic in a former parsonage offered by New Hope Missionary Baptist Church. They’d also designed a master plan for a future community center, community garden spaces, and education spaces.



**ALL TOGETHER** As part of their work with Collaborative Cottage Grove, the team — including Ocasio and graduate student Emily-Kate Hannapel (l-r) — assessed the community’s Apache Park for potential improvements. Thanks to the efforts of residents, the collaborative, and the CC-ED, Greensboro selected Apache Park to receive city funds.

To get the Cottage Grove residents’ feedback on the new project, the students printed out images of different outdoor designs, such as lamp posts and playground equipment, and asked residents to circle the things they would most like to see in their space. Having a visual aid was especially important for a diverse group of end users that included non-English-speaking immigrants and refugees.

Graves says she and her team members expected the Cottage Grove residents to gravitate toward features such as a playground for their children. “But they circled things like trash cans and covered bus stops.” Soon, those worksheets will translate into visually appealing, functional spaces that enhance the lives of Cottage Grove residents.

Hicks adds that not only was the team able to use those circled images as a way of sparking conversation, they got more feedback than they would have with a standard survey. “With my experience teaching and observing other community-based designers over the years, I’ve been exposed to a lot of different techniques for working with community members to get their input,” he says. “Knowing which ones are most appropriate requires a lot of listening and trying to understand the people with whom we’re collaborating.”

This thought leadership and approach to fostering the next generation of designers caught the attention of the national Council for Interior Design Accreditation, who honored Hicks and the CC-ED with the 2015 CIDA Award of Excellence. That same year, the North Carolina Campus Compact recognized Hicks with the statewide Robert L. Sigmon Service-Learning Award.

“Students who study under me in UNCG’s interior architecture program are exposed to a different way of practicing design — one that includes participants from all walks of life, from the CEO to your average neighborhood Joe,” Hicks says. “I hope my students come out of UNCG with a bit more empathy toward different perspectives and different populations, and are able to work in meaningful ways that will impact their own communities wherever they go.”



**TEACHABLE MOMENTS** Hicks has received two UNCG teaching excellence awards. He brings that excellence to his work with the CC-ED. “I use plain language to communicate complex concepts in ways that meet students and community stakeholders where they are.” Above, Hicks and undergraduate fellow Elizabeth Graves visit a project site in the Cottage Grove community.

*By Robin Sutton Anders • Photography by Martin W. Kane • Learn more at <https://iarc.uncg.edu/cc-ed>*





# THE LONG GAME

## A winning effort to equip kids for success

AS A YOUNG EDUCATION PROFESSOR IN THE 1970S AND 1980S, Dr. Tom Martinek was interested in the impact of teacher expectations on students — the Pygmalion effect. He was preparing future PE teachers and working to understand how things like “learned helplessness” might affect students.

“That research was a stepping stone for me to begin to try things out, to take that research and try to apply it to programs in the community,” says Martinek, now a professor of kinesiology.

His early work helped at-risk kids through after-school programs that involved physical activity. They were mostly short-term efforts that ran for a year or two and provided Martinek with fodder for journal articles.

But Martinek wanted to do more. And he thought a framework called Teaching Personal and Social Responsibility through Physical Activity, or TPSR, was the key.

TPSR was developed by Don Hellison, a now-retired professor at the University of Illinois at Chicago. The framework sees sports and physical activity as a way to teach children important skills and values — self-control, respect for each other, trying your best, setting personal goals, and helping others.

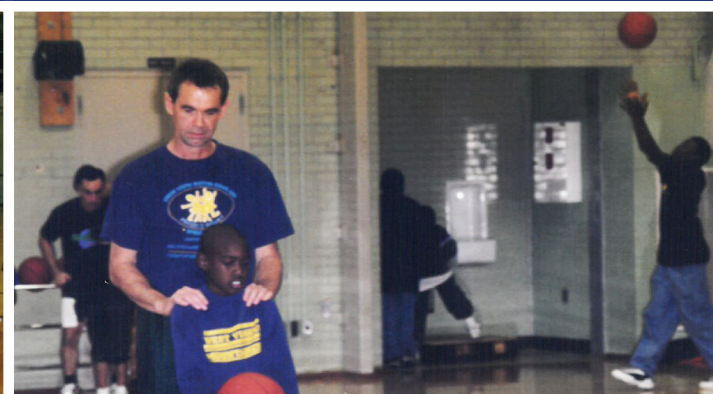
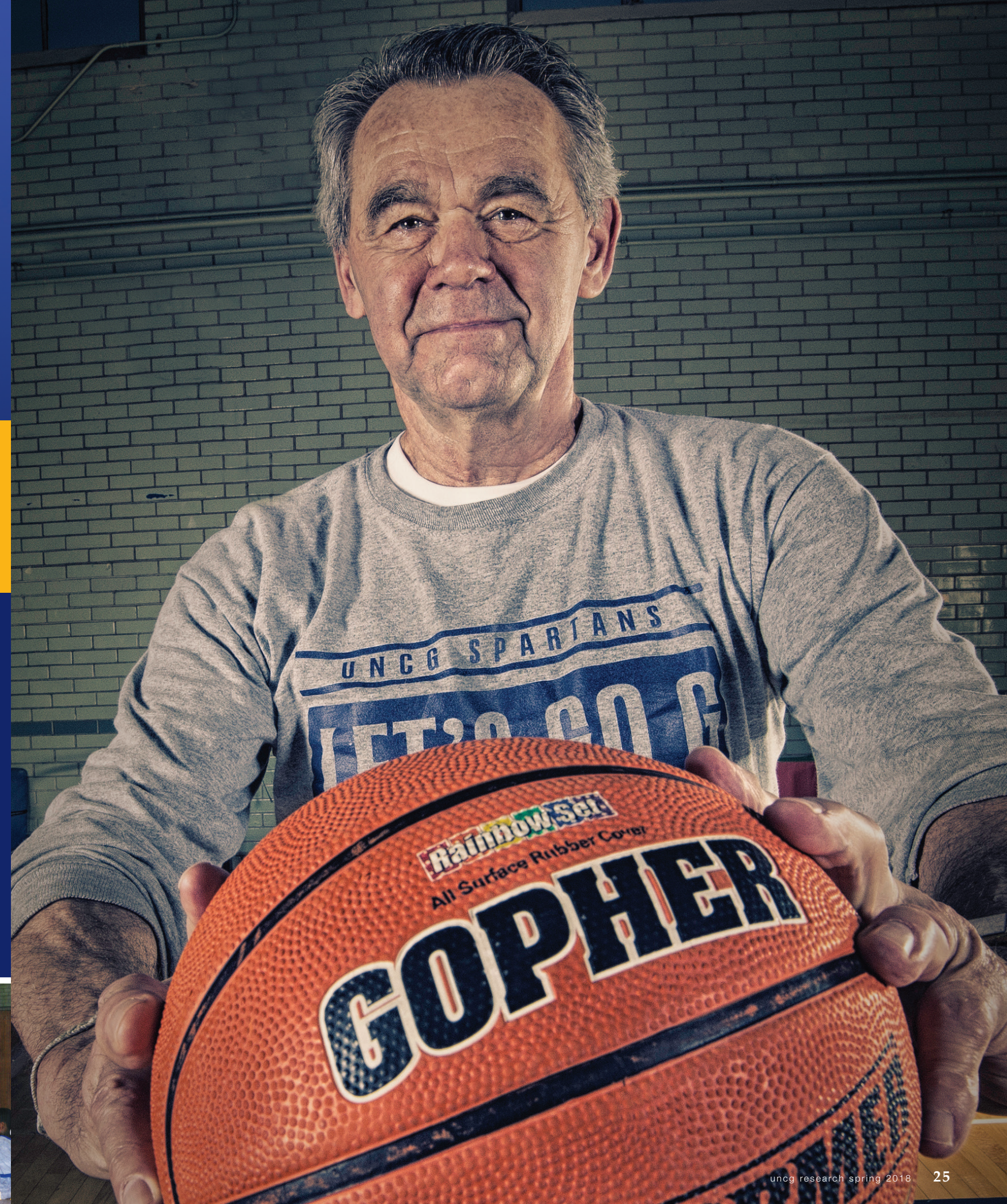
Martinek’s opportunity came when the principal of Greensboro’s Hampton Elementary School approached him in 1991 for help.

“She thought the students were really vulnerable to dropout and different kinds of risk behaviors later on,” Martinek says. “She also knew that a lot of these kids didn’t have much to do after school.”

Most of the kids who attended Hampton lived in the nearby Morningside Heights public housing community. With a little funding from an NC State University grant program, Martinek began bussing 24 third, fourth, and fifth graders to UNC Greensboro twice a week after school.

### WHO’S PYGMALION?

The Pygmalion effect, named for George Bernard Shaw’s 1913 play, describes how higher expectations of student success by a teacher can promote higher student performance.





It was the birth of Project Effort, a program that still operates more than 25 years later and has become a national model for using sports to help kids who are at risk develop critical life skills.

A typical after-school session includes reviewing goals, physical activities in small groups, and then discussion and reflection on their activities.

For the students in Project Effort, grades improved, but more important were the changes in in-school behavior. Martinek and two graduate students reviewed four years of data to measure changes in how often students were reprimanded by their teachers or were referred to the principal's office.

Over the course of a year, the average number of referrals to the principal's office dropped from 11 to 9 per student. More striking was the reduction in teacher reprimands over the same period — from an average of 41 during the first quarter to 28 during the last, a 31 percent decrease.

Students stayed in the program through elementary school and middle school. When they reached high school, they started directing some of the activities themselves, learning valuable leadership skills.

"I remember a bunch of teenage kids," says Rashard Jones, who first encountered the program in 2001, when he was an art teacher at Hampton and a youth baseball coach. "The program was intentional about empowering these teenagers."

Throughout the years, Martinek was there — patient, persistent, purposeful — mentoring UNCG students and the children who came to the program.

Jones remembers one middle school girl in particular. Her father and two brothers were incarcerated. "I know initially she was probably pretty tough to work with," Jones says. But Martinek persisted. By high school, the young girl was a Project Effort student leader, and she went on to earn bachelor's and master's degrees.

"Dr. Martinek has a high level of love, empathy, compassion and just selflessness," Jones says. "It draws other people in, makes them want to be a part of it."

### MISSED OPPORTUNITIES

Martinek is at the forefront of a growing movement of scholars and practitioners who see sports as an underused method to build stronger societies and help individuals be more resilient.

Santos Flores, a second-year PhD kinesiology student working with Martinek, says youth sports in America often focus narrowly on skill development, reducing the potential positive impact.

"Elite performance deprioritizes life skill development," he says. "We're missing a major opportunity to develop youth and sports."

Children often find themselves focused on a single sport, rather than learning a range of activities. Success means moving into ever more competitive venues — high school sports, college sports, and professional or elite-level amateur sports.

"If we're only coaching for elite professional athletic development, then we're only coaching for a very small percentage of the youth population," Flores says.

Instead, Flores says, young people should be encouraged to

### FIGHTING FOR COMMUNITY

As part of his UNCG master's degree in peace and conflict studies, Santos Flores studied capoeira in Brazil. The sport — martial arts that sometimes resembles dance more than fighting — is practiced by children and adults.

Capoeira, he says, incorporates many of the same developmental lessons that TPSR does.

"These life skills are being transmitted through the martial arts," he says. "Capoeira is very unique among sports because it incorporates such a strong sense of community participation across ages."

Flores hopes to travel to Puerto Rico this year to see how youth sports there might be helping children maintain resilience after a natural disaster. Hurricane Maria destroyed roads, the power grid, and other infrastructure on the U.S. island.

This aligns with his interest in how sports might be used to help children who have experienced large-scale trauma, such as the children of refugees, become more resilient.

In Greensboro, UNCG's Center for New North Carolinians collaborates with Martinek's group to bring Project Effort to immigrant and refugee youth.

Sports with a TPSR framework, Flores says, can offer refugee children a chance to build new social relationships and help integrate them into a new culture.



### A GAME CHANGER

Hemphill says restorative youth sports operate on three levels:

- 1 First, everything is done in a "restorative manner," with the aim of building and maintaining strong interpersonal relationships and a sense of community. For example, there's a focus on making sure children have their needs met, so they can develop positive relationships with each other and adults.
- 2 On the second level are awareness circles, helping youth have constructive conversations and solve problems. Sports provide opportunities for kids to have these conversations and practice self-awareness. Players might ask "Why did I shoot so poorly? Why did I not include my teammates?" Hemphill says. "All kinds of opportunities are there for a student to be engaged."
- 3 The third level comes into play when conflicts or wrongdoing must be resolved. "A facilitator would frame the conversation around what happened and why, what needs to be done to repair that situation, and what can be done for the future."

participate in multiple sports, which can improve their physical performance and assist in preventing injury.

And most youth sports programs do a poor job of connecting lessons learned in sports to other areas of a child's life, a key value of TPSR.

### LESSONS ABROAD

Others at UNCG are looking at how TPSR can be expanded and how lessons learned from Martinek's Project Effort might apply outside the United States.

Assistant Professor of Kinesiology Michael Hemphill met Martinek in 2008 through a workshop at Purdue University, where Hemphill was attending graduate school.

"That was a clarifying moment," Hemphill says. He realized there had been a lot of work done on how to implement TPSR programs, but not much on how to train professionals to use it.

In Hemphill's first job after graduation, he helped train undergraduates who would go on to work with youth. He also traveled to New Zealand and began to develop a relationship with a TPSR researcher there.

In 2016, Hemphill came to UNCG. There, he met Dr. Emily Janke, associate professor of peace and conflict studies and director of the university's Institute for Community and Economic Engagement, who was interested in restorative justice.

As they talked, they discovered they both had contacts at the same New Zealand university. They also began to see parallels between TPSR and restorative justice.

Restorative justice is an approach to criminal justice that focuses on rehabilitating offenders by reconciling them with victims and the community. New Zealand is a global leader in restorative justice; it even has restorative justice schools.

*Restorative justice concepts are very common in New Zealanders' lives — with one notable exception. "There was this culture of sports that kind of prioritized winning and kids just having fun," Hemphill says. "It's like the last frontier of restorative justice is sports. They just haven't connected."*





**STRONGER COMMUNITIES** The Teaching Personal and Social Responsibility model uses sports and physical activity to teach children important skills and values, such as self control, respect for each other, trying your best, setting personal goals, and helping others.

“The hope is to pivot and integrate this work locally here in Greensboro.”

Greensboro and UNCG is a good place for that kind of work, Hemphill says, in part because of the foundation Martinek has built over 40 years.

“This university has really made a contribution in this disciplinary area,” Hemphill says. “I couldn’t overstate the contributions that Tom has made.”

### GROWING WITH THE PROGRAM

Project Effort is not Martinek’s only legacy. Another is the development of the Middle College at UNCG, a Guilford County public high school Martinek was a key partner in starting.

As they entered high school, some of the students Martinek worked with on Project Effort struggled.

“They would either not show up to school,” Martinek says. “Or they would show up and not do anything. Sometimes they’d show up and cause problems.”

Research done by one of his graduate students indicated a major reason for this was cultural differences between Project Effort and the high school environment.

Martinek dreamed of a school based on Project Effort principles, where those high school students could take leadership roles, make more decisions themselves, and thrive.

He learned that the Guilford County Schools superintendent was interested in a middle college — a public school located on a college campus. It took a few years, but in 2011 the Middle College at UNCG opened.

These days, Middle College high school students help run the Project Effort program. “We’ve got a great group of high school kids who do a great job,” says Martinek. “It’s been a nice marriage.”

Not unlike the marriage that Martinek has forged over the last few decades between UNCG and the community.

Some 800 Guilford County children have been touched by Project Effort.

Project Effort’s influence is also felt in other programs that serve at-risk youth, such as the Communities in Schools African American Male Initiative, run by Jones, the former Hampton art teacher.

“Since we started this program, Martinek has brought Project Effort over every Tuesday,” Jones says. Project Effort leaders mentor the youth in Jones’ program. “Our kids get the benefit from it, because of those kids who are coming from the Middle College.”

No matter how many youngsters these programs touch, the focus remains the same. Martinek wants to give children the sense they can control and improve their own lives.

When Martinek and his students conducted a study following up with adult graduates of Project Effort, they discovered many of the program’s lessons are sticking.

“They all had different pathways, but regardless of the context, one thing that came out was the idea of relationship building,” Martinek says. “And of having had some sense of control over what they could do in their own situations. The idea of self-direction was an important quality they took with them.”

To succeed, you need to feel like you have a say in your destiny.

“Getting the sense that you can change things around, control things, that gives them that foothold,” Martinek says. “I think that’s probably the most important thing.”

*By Mark Tosczak • Portrait photography by Mike Dickens, Project Effort photography courtesy of Tom Martinek • Learn more at <https://go.uncg.edu/martinek> and <https://go.uncg.edu/hemphill>*

**MILESTONE** This summer, the Teaching Personal and Social Responsibility Alliance will hold its annual conference at UNCG. The location was selected, in part, to celebrate Project Effort’s 25 years of success.





# Attack of the Killer Ticks



Imagine a world in the not-too-distant future where the government assigns where you live. Your social media footprint impacts your financial stature, and an Asheville Cracker Barrel restaurant exists as a museum for 21st century ephemera.

Oh, and there's an infestation of killer ticks in the Appalachian Mountains.

Welcome to "The Salt Line," the latest novel by Holly Goddard Jones. The associate professor of creative writing at UNC Greensboro blends elements of horror, dystopia, and literary fiction in a book that has received positive reviews from Kirkus, Publishers Weekly, and the L.A. Times. While previous works — the 2009 short story collection "Girl Trouble" and her 2014 debut novel "The Next Time You See Me" — are realistic tales of blue collar life in rural Kentucky, Jones' second novel takes a futuristic bent.

"The Salt Line" imagines a dystopian America ensconced behind a tick-repellent scorched earth barrier. The nation holds tight moral and geographical control over its citizens and has been redistricted into livable zones. Jones, whose previous works have received acclaim in The New York Times, Chicago Tribune, People, O Magazine, and more, calls this work "symbolic speculation" rather than pure science fiction. "I'm not forecasting that ticks will destroy the world; I'm using that scenario to write a future that comments on the present," she says. "It was scarier if the future felt very much like our present, with some tweaks of degree."

Jones, who has received awards from The Fellowship of Southern Writers and the Rona

Jaffe Foundation, invokes literary influences ranging from Margaret Atwood to Stephen King to Jane Austen in "The Salt Line." As the novel takes its protagonists — an elite group of wealthy travelers — on a treacherous journey of extreme ecotourism through tick-infested woodlands once known as the Great Smoky Mountains, themes of environmentalism, class, and feminism emerge.



**TICKS OF DYSTOPIA** Jones sits outside a local Cracker Barrel. The author "tweaked" familiar settings like the ubiquitous restaurant to craft a disturbing alternate reality.

Female characters in the story, once relegated to traditional maternal roles, rise up to protect the future. Jones wrote the first hundred pages of the book before becoming pregnant with her first child; she says the story's trajectory changed when she became a mother. "When I started having kids, the future went from being abstract to deeply personal. That's when the themes of motherhood became so critical to the book — less because I was newly a mother and therefore interested in writing about the topic but because I suddenly realized that parenthood is sort of the central question in any meditation about the future."

Jones is committed to sustainability and responsible resource management in her own life. She devotes a section of her professional website to advice about sustainability practices, from cost-benefit analyses of solar panels and electric cars to reflections on socially conscious investment portfolios. "My guiding philosophy is that doing something is always better than doing nothing," she says. "And a lot of people doing something will matter."

As a writer, scholar, and environmentalist, Jones raises complex moral and political issues while keeping some perspective: "If a reader has a good time with the book, and has her thoughts provoked, that's enough for me."

By Heather C. Watson • Photography by Mike Dickens • Learn more at <https://go.uncg.edu/goddardjones>



## FIGHTING TO BE HEARD

A homemade pan of lasagna saved his documentary.

For nine years, Department of Media Studies Professor Matthew Barr spent weekends traveling to Tar Heel, North Carolina. There he filmed "Union Time – Fighting for Workers' Rights," about the 16-year struggle of workers to organize the world's largest pork processing plant.

Shortly after their victory, Barr's project unexpectedly ran into trouble. He had cultivated relationships with Smithfield Packing Co. slaughterhouse employees and United Food and Commercial Workers organizers, but one of his primary interview subjects and a leader in the fight suddenly didn't want to be filmed anymore.

It took Barr's culinary talents to win her over.



**THE REAL STORY** Barr spent nine years filming workers of the Smithfield Foods pork processing plant. "It is history told by the people who made it."

As Barr had gotten to know the workers, he learned that she liked a dish that happened to be one of his favorites. "I made a big pan of lasagna and drove it down to the union headquarters," he says. "I understood the personal pressure that these workers were under. I wanted to show that I cared about them, and that it wasn't 'just a story.'"

The personal approach paid off. She resumed her participation in the film and, thanks to her influence and Barr's persistence, others stepped forward too.

Barr trimmed 170 hours of footage into what he calls "86 minutes of oral history and documentary" for the film's premiere at UNCG in 2016. The final product, narrated by actor and activist Danny Glover, explores what Barr calls a "David versus Goliath" story.

"It depicts the atmosphere of injury and intimidation that prevailed at the Tar Heel plant," says Barr. Fear of losing their jobs deterred many workers from openly participating in union efforts.

"It shows the courage of the workers who fought for a union, and how working conditions improved when — after two failed attempts — they finally succeeded."

Barr has presented the film at the headquarters of the National Labor Relations Board in Washington, D.C., universities including Cornell University and UCLA, organized labor conferences, festivals, and churches. This summer he plans to produce hour-long and half-hour versions aimed at the

education market, union-training programs, and organizing drives.

"The film's message of solidarity resonates with many audiences," says Barr. "African American, Hispanic, Lumbee, and white workers came together, and that is very powerful."

"Union Time" is the latest product of Barr's nonprofit, the Unheard Voices Project, which produces documentaries about working people facing challenges of globalization and economic upheaval. Other films include "Wild Caught," about the troubles of a fishing community in Sneads Ferry, North Carolina, and "With These Hands," a look at the struggling U.S. furniture industry through the closing of the Hooker Furniture factory in Martinsville, Virginia.

Barr had always wanted to produce a documentary about a union and was excited when an acquaintance introduced him to the Smithfield campaign. Two UNCG grants totaling \$10,000 funded his early work on "Union Time," while \$85,000 from individuals, including relatives, enabled him to complete the project.

"To me, making this film was a huge act of faith," Barr says.

"I believe it tells an important story. It is history told by the people who made it."

By Chris Burritt • Photography by Mike Dickens, illustration from "Union Time" by Alexis Rodriguez. Learn more at <https://go.uncg.edu/barr>



## AFTERMATH

Two natural disasters, roughly a century apart, devastate a pair of American port cities.

One quickly regained its position as a center of global commerce. The other became a cautionary tale on how not to manage a disaster.

UNC Greensboro sociology professor Steve Kroll-Smith examines how market forces, class, and race combined to produce two different outcomes in "Recovering Inequality: Hurricane Katrina, the San Francisco Earthquake of 1906, and the Aftermath of Disaster."

The book, due in July, is his second on Hurricane Katrina, which struck New Orleans in 2005. The first, 2015's "Left to Chance: Hurricane Katrina and the Story of Two New Orleans Neighborhoods," was co-written with University of New Orleans sociology professors Vern Baxter and Pam Jenkins.

"Before we finished that first book, I had started to look at the San Francisco earthquake," he says. "These were two iconic cities, and I thought a comparison might be worth the effort."

San Francisco, Dr. Kroll-Smith says, "recovered miraculously" following the earthquake, which killed 3,000 people and resulted in fires that torched large swaths of the city.

"San Francisco at that time was the most powerful banking center in the West," he says. "It was also the main port of call for trade between the U.S. and Asia. So the Roosevelt administration made it a top priority to get the city back up and running."

New Orleans, while generating a good deal of tourism revenue, isn't a major financial center, Kroll-Smith says. "New Orleans is not the port city it used to be, and in some ways it was viewed as market expendable."

The city is predominantly African American, and Kroll-Smith believes that race and socioeconomic factors were factors in the slow response from federal authorities after Katrina.

An estimated 1,800 people died because of the storm, including more than 1,500 in Louisiana.

With funding from the Bill and Melinda Gates Foundation, he and his colleagues spent four years studying recovery in New Orleans. In "Left to Chance," they focused on two mostly African American neighborhoods, one working class, the other middle class.

More people in the middle-class neighborhood were able to evacuate prior to Katrina's arrival, and were able to apply for assistance more easily as a result, Kroll-Smith says. Still, relief wasn't made very accessible for anybody.

"It became a real feat of gymnastics to jump through the necessary hoops to get the money set aside for rebuilding your house, buying new furniture," he says. "The administration of relief itself became a significant stressor in people's lives."

Last year, Hurricanes Harvey and Maria devastated Houston and Puerto Rico, causing hundreds of billions in damage. The coming years, Kroll-Smith says, will likely bring similar catastrophes.

"Katrina was in a lot of ways a school marm, in that she had a lot to teach us about what we can anticipate in terms of severity of storms, and in terms of how unprepared we are for a relief effort," he says. "I don't think those lessons were learned, quite frankly. And we need to think of more than infrastructure recovery, as important as that is. There are psychological and social traumas. It's far harder to recover a self than to recover a structure."

By Robert Lopez • Photography courtesy of Steve Kroll-Smith & Wikimedia Commons • Learn more at <https://go.uncg.edu/krollsmith>

Kroll-Smith says disasters create "fissures" in society. "You see what actually makes people tick, what keeps things hanging together."

## FATS AND YOUR SYNAPSES

High saturated fat diets physically alter the way we think about food. They wreck the brain's pleasure center, requiring ever more saturated fat to elicit the same level of enjoyment. Assistant professor Steven Fordahl is determining how and why that wreckage occurs.

Dr. Fordahl explores the flow of neurotransmitters in the brain to identify the causes of — and potentially treatments for — obesity. Obesity is one of the fastest growing public health concerns in America. According to the Centers for Disease Control and Prevention, it affects over one-third of our population.

To better understand obesity's dominance over the brain, Fordahl measures real-time neurotransmission in response to food intake. The technique is typically used to map neural circuitry, but Fordahl, who joined UNC Greensboro's Department of Nutrition last year, uses it to illustrate the profound effect that dietary choices have on normal brain function.

Fordahl's work builds upon research conducted during his postdoc, which found that the brain responds differently to various types of dietary fat. He says an ideal diet limits saturated fat in favor of mono- and poly-unsaturated fats. The combination helps the brain control appetite, leading to less potential for overeating.

As we consume food, the brain releases the neurotransmitter dopamine as a messenger to the central nervous system. The dopamine activates specific neural circuits to tell us we are full and feel content. During his postdoc, Fordahl measured dopamine neurotransmission in response to diets high in saturated fat and found significant reductions in regular dopamine message delivery.

"Saturated fat hijacks the brain's reward system in a way that may

promote overeating, especially over time," he says. "A diet that is high in saturated fat may change the way we perceive the foods we are eating."

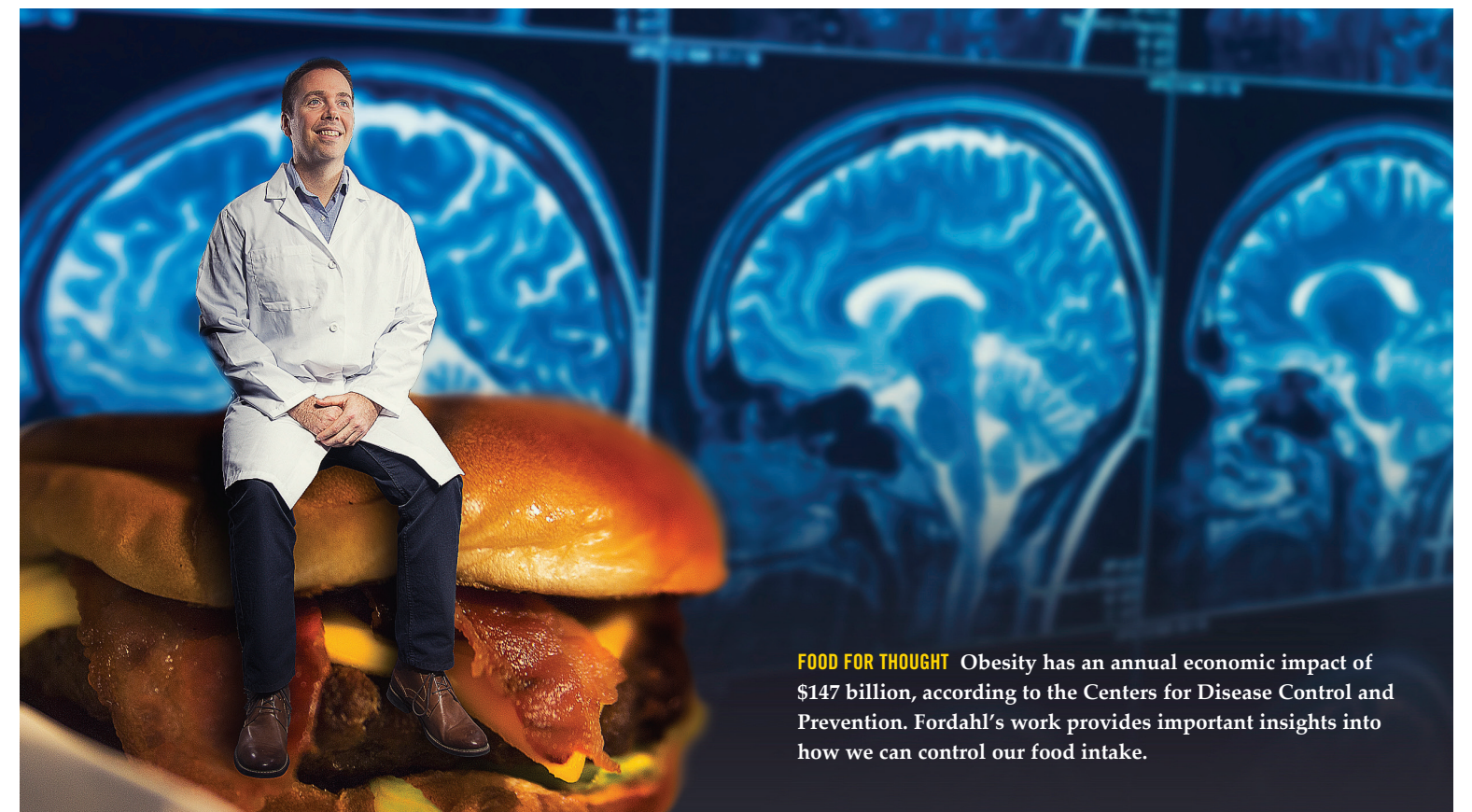
Over the past year Fordahl's research group at UNCG has sought to further understand how saturated fat takes control of these normal brain functions. He is examining whether immune system proteins, called cytokines, change dopamine signaling in the brain as a result of a poor diet.

When fat tissue expands, it triggers the release of cytokines, which contributes to the development of insulin resistance and — if activation of the immune system is prolonged — diseases like diabetes. Fordahl wants to know if the same inflammatory immune response alters dopamine's control over feelings of fullness, potentially accelerating obesity and other disease progression.

To get a clear picture of the relationship between food choice and immune response, Fordahl is measuring cytokine levels in dopamine-rich areas of the brain under different dietary conditions. "We ran a full suite of experiments to see how the neurons in the dopamine-rich regions of the brain are functioning in response to different diets," says Fordahl. "The next step is to correlate that with cytokine levels, to measure the impact of inflammation on dopamine signaling."

Fordahl's results already have important implications for obesity prevention. As he digs deeper into how saturated fats reprogram the brain, he ultimately hopes to discover how to reverse the whole process and restore the body back to health.

By Rebecca Guenard • Composite image by Mike Dickens • Learn more at <https://go.uncg.edu/fordahl>



**FOOD FOR THOUGHT** Obesity has an annual economic impact of \$147 billion, according to the Centers for Disease Control and Prevention. Fordahl's work provides important insights into how we can control our food intake.





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**GIANT STEPS** UNC Greensboro's impactful School of Nursing and science programs will soon have a new home. Thanks to a voter-supported Connect NC bond, the outdated McIver Building will come down this year, to make way for a new Nursing and Instructional Building. With 14 classrooms and 39 labs, the five-story, 180,000-square-foot building will provide much needed space for our growing programs — allowing our regional and national impact to expand for decades to come.  
<https://go.uncg.edu/BigBuild>

