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Equipping probationers with the tools to make better choices

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Endeavors
Spring 2018

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Endeavors magazine is a joint publication of the Office of the Interim Dean of Research and Graduate Studies and TCU Marketing & Communication. The magazine’s editorial content highlights a cross section of academic research and scholastic inquiry.

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Advancing the Academic Enterprise Through Research

Conceptually, science encompasses knowledge development and application using systematic processes of inquiry to improve the human condition.

The systematic pursuit of empirical truths through research is invariably changing and evolving with the exponential increases in technology. These technological advances allow for greater synthesis and integration of information that promotes a better understanding of how things work in our world. As scientific discovery continues to accelerate, we must persist in questioning not just what we know but also what we don’t know.

Within our TCU learning community, we pride ourselves as teacher-scholars and involve students in research and creative activities that help promote lifelong learning. Faculty research and scholarship enlightens teaching, keeps academic disciplines up to date and cultivates state-of-the-art learning. Research-active faculty bring enthusiastic, systematic inquiry into their classrooms, engage and inspire students, and pique interest in discovery-based processes.

Moreover, inquisitive students invigorate faculty with their ideas and eagerness to learn. I once overheard a faculty member discussing research ideas suggested by students that could generate interesting directions for subsequent research. Indeed, opportunities for a student-faculty connection around research topics are endless.

Evidence is accumulating about the benefits of student learning from active participation in research processes. Engaging students in research is analogous to Bruner’s discovery learning or active participation in inquiry-based problem-solving. Additionally, in that active-learning methods have been shown to improve student performance and reduce failure, the National Academy of Sciences recommended active learning as the preferred teaching practice over traditional lecturing in STEM courses.

Undoubtedly, there is a compelling link between research, teaching and learning. Considering that about 25 percent of TCU students plan to attend graduate or professional school, our faculty are compelled to bring their research into classrooms. Early exposure to and involvement in research helps instill a desire for autonomous and continuous learning. Many TCU faculty members already actively involve students in research and provide inquiry-based active-learning opportunities, but as with most important things in life, we always have room for improvement in our pedagogical practices.

Researchers in TCU’s Institute of Behavioral Research are constantly looking for new, better and more state-of-the-art methods to improve rigor and reproducibility in research. The institute investigations primarily focus on improving the human condition by changing behaviors through the development of effective therapeutic interventions. We are targeting areas of significant public concern, and in recent years have concentrated our research on improving addiction treatments for criminal justice populations and adolescents, as well as reducing the spread of HIV and related infections by evaluating risk reduction and treatment-adherence interventions. Indeed, we can have the greatest advances in health care, but if behavioral adherence to treatment protocols cannot be optimized, these advances will have limited applications and fewer positive effects on illnesses and health.

Acknowledging TCU’s religious heritage and the value we place on research and intellectual inquiry, let me leave you with a captivating quote:

Science investigates; religion interprets. Science gives man knowledge which is power; religion gives man wisdom which is control. Science deals mainly with facts; religion deals mainly with values. The two are not rivals.

– The Rev. Martin Luther King Jr. (Sermon, Dexter Avenue Baptist Church, Montgomery, Alabama, Sunday, Aug. 30, 1959)

Patrick Flynn
Saul B. Sells Chair of Psychology
Professor of Psychology
Director of the Institute of Behavioral Research at TCU

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When Fort Worth pediatrician Justin Smith asked the parents of his patients what changes they would like to see at his clinic, the parents wanted a dedicated waiting room for newborns, a child-size potty chair in the restroom and a telemedicine link.

But ideas are one thing and execution is another — especially when large institutions such as Cook Children’s Health Care System are involved. “Some of the ideas … didn’t fit with the cookie-cutter plan for building a practice in our system,” said Smith, director of primary care innovations at the children’s hospital.

Some people at Cook Children’s were unsure the physical design changes were doable, Smith said, while others felt the changes wouldn’t fit templates meant to protect the hospital’s brand.

But Smith had studied, of all things, complexity theory — a field related to cybernetics, chaos theory and even studies of ants and bees — and it’s more germane to hospital work than most might think.

With complexity leadership skills learned in a Neeley School of Business physician leadership course taught by Mary Uhl-Bien, BNSF Railway Endowed Professor of Leadership, Smith found it easier to communicate with administrators, navigate hierarchies and get the families’ requests installed.

Uhl-Bien (yule-bean) is a leadership expert. The professor of management, having consulted for the likes of Walt Disney World and State Farm, has spent decades studying how large organizations react to unpredictable pressures. The most successful ones, she’s found, downplay hierarchy, which can make them more receptive to ideas from unexpected places — such as the parents of newborns or a physician who isn’t top brass.

“Our management system and our organizational structures were developed for the industrial age,” Uhl-Bien said. “They were developed based on bureaucracy, and bureaucracy is a hierarchical order-and-control system. It’s [built] on old Newtonian logic based on predictability and planning and control.”

But such systems work against adaptability to our fast-changing world. Take hospitals, for instance. In a health care environment that is in constant, drastic change — Uhl-Bien said it’s “in complexity” — employees’ and administrators’ ability to work within a less hierarchical environment is crucial to a constructive reaction.

The Affordable Care Act “is an issue, and the regulatory environment. Then you have the issue of telemedicine, you have wearable technologies, you have the changing doctor-patient relationship, you have issues of pay and pay for performance, transparency — and that’s just the tip of the iceberg,” Uhl-Bien said. “All of these things are swirling around, and as they’re swirling around, they mean we cannot operate in a very predictable way. We have to be adaptive.”

Uhl-Bien’s course, based on her research into dozens of successful and less successful companies, teaches doctors such as Smith to interact in ways that steer institutions away from rigid hierarchies and toward reacting productively to change and new ideas.

As health care organizations expand and consolidate to try to protect themselves from unstable insurance markets and legislation, Uhl-Bien said physician leadership is key. Otherwise, there is a danger that their bureaucracies will grow too rigid to allow a nimble response to change.

### Unexpected Change

Uhl-Bien began her career studying interpersonal relationships among leaders and employees and teaching executives about leadership. But by the late 1990s, the professor had grown restless with a line of research that she believed didn’t take context into account.

“I felt like we weren’t really telling [executives] what they needed to know, and we were oversimplifying,” Uhl-Bien said. Then she began to learn about how complex systems adapt to environmental pressures. In two words, she said, complexity equals rich interconnectivity. It denotes a system in which component parts interact and change each other in unexpected ways. Complexity and its implications for large organizations intrigued her.

In 2007, Uhl-Bien and her colleagues won a $300,000 grant from the management consulting firm Booz Allen Hamilton to study leadership and adaptability in health care. Over the next two years, the team studied six U.S. health care systems in depth, then moved to financial institutions, an aerospace company and a medical equipment manufacturer. What they found was that the systems reacted all wrong to the challenges they faced.

“The major finding was this: that health care is in complexity,” Uhl-Bien said. “When you’re in complexity, you need to respond with a complex adaptive response.”

That is, the organizations doubled down on control, spending huge sums to, say, script health care workers’ language or conduct surveys. Too often, the desired results didn’t materialize.

Instead, health care executives need to focus on networking the organization, Uhl-Bien said. That includes making sure that people from different departments meet
“We need to start training new physicians in how to work in a team from the very first day, instead of training them [only] as individuals.”

Mary Waller, professor of management in the Neeley School of Business

and that they learn to trust one another. It also means teaching them to take an exploratory rather than a directive approach to problem-solving; getting them to anticipate and work with, rather than squash, co-workers and bosses who object to new ideas; and making people comfortable with ambiguity and with partial successes.

Learning not to present ideas as all-or-nothing proposals is a big one for doctors, pediatrician Smith said. “We might get away with that in clinical spaces, but if you’re talking about an organization, you kind of have to be happy with 60 percent or 70 percent of your plan,” he said. “You’re not likely to come out of it with the plan exactly intact as the way you first thought it up. Physicians have a hard time with that.”

So which businesses are doing complexity right? Uhl-Bien named Apple under Steve Jobs, General Electric under Jack Welch and Gore-Tex maker W.L. Gore & Associates. For at least part of their history, these companies succeeded largely because of their adaptability. Their cultures encouraged energetic new groupings of people, ideas and resources to solve a problem; after the challenge was solved, the groups disbanded.

“It takes complexity to beat complexity,” Uhl-Bien said. “Each situation that faces you when pressures come in, it’s something different, you haven’t faced it before. It’s going to require agents — which is people, and resources, technology, ideas, whatever — to come together, and they form around that challenge that’s being presented to them. But when that challenge is met, it disbands. Those are networks. When you need the adaptability, the network kicks in. The rest of the time, the operational system keeps it running the way it should.”

**ENGAGE THE TENSION**

Mary Waller, professor of management in the Neeley School of Business, studies how teams under high pressure — such as nuclear power control crews and aviation cockpit crews — respond to unexpected events.

“What I’ve found, and I think this maps onto what Mary [Uhl-Bien] has found too . . . is those teams that are able to tolerate that ambiguity and not try to force-fit the situation into a protocol or a solution that they’ve already learned,” Waller said, “better understand the complexity and can create a novel solution, [and] those teams outperform others.”

Uhl-Bien’s work “is really incredibly appropriate for 21st-century work,” Waller said. “For 20th-century work, we wanted checklists and we wanted standardization. We wanted things to be done as fast [and uniformly] as possible. But the types of tasks that people were performing were in an environment and an economy that was nowhere near as complex as it is now.”

Putting it another way, learning to resist the temptation to fit new problems into Procrustean beds is what organizations need now.

“We need to start training new physicians in how to work in a team from the very first day,” Waller said, “instead of training them [only] as individuals. And then they hit their internship or residency, and suddenly they’re a member of a team and they know [almost] nothing about team dynamics.”

This approach is not without risk, of course. In one health care organization that Uhl-Bien studied, the executive team managed to push quick adaptive change in response to changing conditions. But their actions backfired.

“They were engaging the kinds of conversations that were needed,” Uhl-Bien said. “But they weren’t communicating it well or effectively, and one of the problems when you drive this change is that it goes to people’s fears.”

When the executives mishandled those fears, they soon found themselves removed from power. Uhl-Bien’s team dubbed this snap-back to equilibrium “the rubber band effect,” and it suggests that adaptability requires empathy and finesse.

Indeed, networking is about more than friendly human connection, Uhl-Bien said. The many perspectives, desires and needs within an organization create situations that traditional managers are taught to label “conflict” and to get rid of them. That’s a mistake, she said, not the least because it invites pushback.

At the core of adaptive response is complexity of the tension, Uhl-Bien said. “You have to engage the tension.” For example, a nurse and a doctor have different needs. Instead of one plowing over the other or holding back, they engage and try to come up with a solution that’s adaptive and is generated by that tension.

So far, adaptive response is working for Smith. “A lot of what the class is about is teaching providers the skills they need to effect change better, which translates to happier physicians when they feel like they’re part of a bigger plan,” he said.

“There are some that really want to effect change on a bigger scale, and this class is giving providers that, which will lead to decreased burnout and a better organization as a whole.”
Biochemist studies how dendrimers can help detect biological threats, improve drugs.

BY REBECCA BOYLE

Onofrio Annunziata, professor of chemistry and biochemistry at TCU, studies how to strengthen proteins and alter their behavior. His work might lead to new intravenous drug-delivery methods or new sensors to detect biological threats.

Proteins are organic molecules often described as the building blocks of life. But this simple description, referring to their ability to form the scaffolding of tissues and organs, belies their range of abilities, including use as body-friendly carrying cases for drugs.

Annunziata specializes in dendrimers—synthetic, star-shaped molecules that can bind to and transport proteins. Dendrimers’ symmetrical nature can make the proteins to which they attach tougher and less susceptible to deterioration inside the body.

Dendrimers are engineered on the nanoscale—that’s one-billionth of a meter—and have internal cavities that can be packed with other molecules. They dissolve in water, so they are able to break down in the body and release their cargo. Dendrimers could someday be injected into the bloodstream, where they might release protein-based medicine.

Pharmaceutical companies and research labs are developing stronger proteins that can harbor smaller molecules, such as drugs, and deliver them to specific locations in the body. But to do that, drug designers first need to understand how synthetic proteins work inside the body. Annunziata’s study of dendrimer-enhanced proteins lays the foundation for those lines of inquiry.

Dendrimers come in a variety of sizes, but larger molecules are hard to make because they fall apart more easily, Annunziata said. “Ideally, you want to make a big dendrimer, because you can carry more drug molecules at the same time in the same host particle. … Can we actually assemble small dendrimers to [make] a bigger particle? So instead of having one, we have a small collection of dendrimers that would be attached to each other.”

In a research paper published in 2017 by the American Chemical Society’s journal Langmuir, Annunziata and Viviana Costa, a doctoral student in chemistry at TCU, showed how to create “nanoassemblies” by combining clusters of small dendrimers.

Annunziata’s biochemical research also improves molecular sensors, which can safeguard against poison or biological threats. A sensor contains proteins that react in the presence of a particular chemical. For instance, a sensor might change color if it detects cholera, a bacterium that causes violent illness.

By adding salt, Annunziata found that sensors could enhance the reaction. The additional salt can help push proteins toward the surface of the sensor, which makes dangerous compounds easier to detect. “We could definitely increase the sensitivity of the instrumentation, thereby detecting chemicals at significantly lower concentrations,” he said.

Annunziata is also learning other methods of changing the behaviors of synthetic proteins by applying heat and electricity. Doing so is a measure of molecular control, he said. “We make [particles] decide which environment they want.”

“Ideally, you want to make a big dendrimer, because you can carry more drug molecules at the same time in the same host particle.”

Onofrio Annunziata, professor of chemistry and biochemistry
Anthrax has an Achilles’ heel — one that could help researchers create a new antibiotic to defeat the deadly bacteria as well as more common infections.

Shauna McGillivray, associate professor of biology at TCU, figured out how to render the bacteria harmless in mammals by subverting one of the key enzymes anthrax uses to create disease.

That key is called ClpXP (clp-ex-P). It’s a protease, or an enzyme whose job is to take apart unwanted proteins. ClpXP is present in many bacteria, including anthrax and methicillin-resistant Staph aureus, or MRSA.

“The enzyme functions like a garbage disposal in the cell,” McGillivray said. “If you get rid of it, the cell doesn’t have a way to get rid of these proteins. … They can just kind of gunk up the cell.” A cell that can’t keep its own inner workings free of frayed, used-up protein machinery can stop functioning and die.

Several years ago, McGillivray found that by mutating one of the bacterial genes that encodes ClpXP, she could create a non-virulent version of anthrax, one easily cleared up by the immune system in mice. (Her work at TCU involves a strain of the bacterium that is not harmful. But collaborators at the U.S. Army Medical Research Institute of Infectious Diseases who work with deadly wild-type anthrax found that a mutated ClpXP kneecaps that strain, too.)

Knocking out ClpXP also seems to render bacteria highly vulnerable to cathelicidin, a front-line immune protein that mammals make in response to invasive infection. Another protease found in anthrax, one that under normal conditions would exit the cell and destroy cathelicidin, seems to depend on ClpXP.

After the discovery, McGillivray teamed up with Kenneth Keiler, a professor of biochemistry and molecular biology at Pennsylvania State University, who tested his library of small molecules, consisting of what he described as “chemicals with properties similar to good pharmaceuticals.”

He found one molecule, F2, that incapacitates ClpXP in both anthrax and MRSA, making the bacteria vulnerable to the host’s defenses, though exactly how is still unclear, he said.

McGillivray and Keiler co-authored a study showing how a combination of F2 and penicillin made the bacteria more vulnerable — an eye-opener, since MRSA carries a protective mutation that keeps antibiotics, such as penicillin, from binding to a cell wall. Inhibiting ClpXP seems to circumvent the mutation in McGillivray’s experiments, restoring penicillin’s effectiveness in destroying bacteria.

F2 isn’t suitable for human use, but if researchers can develop an antibiotic that targets ClpXP that is safe, it could help treat a host of troublesome infections. That’s no small thing since the Centers for Disease Control and Prevention announced in 2013 that the world has entered a post-antibiotic era for some microbes, causing widespread antibiotic resistance.

MRSA is one of the worst offenders. First reported as a curiosity in the 1960s — just a few years after the introduction of the antibiotic methicillin — MRSA has in recent decades become a global scourge. In 2011, it killed more than 11,000 people in the United States alone, the CDC reported.

“One of the things that’s really tough about MRSA is it becomes antibiotic-resistant very, very quickly. … So the more tools you have in the toolbox for treating the disease, the better.”

Shauna McGillivray, associate professor of biology

“Biologist Shauna McGillivray at work in her TCU lab. McGillivray studies the deadly bacterial infection anthrax and believes it has an Achilles’ heel — one that could help researchers create a new antibiotic to defeat it as well as more common infections.”
In late 2016, Lori Boornazian Diel cracked a passage of mystifying hieroglyphics in an old pictorial manuscript known as the Codex Mexicanus. The breakthrough proved a watershed moment for the art historian, who began studying codices in graduate school as part of an interdisciplinary curriculum focused on pre-Columbian culture and art.

Written in Nahuatl, a native language, the Codex Mexicanus offers rare insights into how the Aztecs struggled to assimilate following the Spanish conquest in 1521. Like other Aztec pictorial manuscripts created after conquistador Hernán Cortés’ decisive victory, the Codex Mexicanus was small enough to carry in a pocket and probably was intended for daily use.

Written at the end of the 16th century on paper made from the fibers of a ficus plant, the 100-page book measures only about 4 inches by 8 inches. “The Codex Mexicanus had actually been dismissed because it wasn’t that pretty,” said Diel, associate professor of art history at TCU. “There are other codices that are much more beautifully painted, more like the European illuminated manuscripts.”

In all likelihood, generations of scholars also ignored the
The Codex Mexicanus offers a window into this new reality, one that had undergone a seismic political, religious and cultural shift. The Codex Mexicanus because they didn’t understand much of the work’s meaning and implications. “No one had bothered with it since the early 1950s,” Diel said, “which was something that drew me to it.” She also thinks the fact the fragile book has long resided in the Bibliothèque Nationale de France, the national library based in Paris, contributed to its relative obscurity. “It’s in poor condition, with the paint flaking off when you turn pages,” said Diel, who arranged to see the document in person on two occasions. The first time was in 2012 with a grant from the TCU Research and Creative Activities Fund. With a second TCU grant, she returned in 2016 to conduct research for a book about the manuscript. Diel also has received support from the Robert and Mary Jane Sunkel Art History Endowment. The University of Texas Press will publish Diel’s book.

“The Codex Mexicanus has long been treated as a miscellany and has thus defied an explanation that accounts for the whole,” said Elizabeth Boone, chair of the History of Art, Design, and Visual Culture Department at Tulane in New Orleans and Diel’s longtime mentor. “What Lori has been able to do is reveal how important this document is to understanding the yearnings of the indigenous elites along with how they adopted and adjusted European literary genres. This opens a window, bringing the reader deeper into the world of the Nahua intellectuals in the late 16th century.”

CULTURES CLASH
In many ways, the Codex Mexicanus documents the cultural collision between the conquering Europeans and a native population that had dominated its region for centuries. “Egypt and Greece seem to get all the attention, but ancient Mesoamerican cultures, including the Maya, the Inca and their predecessors, are fascinating,” Diel said. Even as an undergraduate student at Emory University, she was drawn to the conquest era’s literature and artwork, particularly images depicting early contact between Aztecs and Spaniards. “When the Spaniards arrived, they burned the books they thought were pagan, so there are few pre-Conquest Aztec books that have survived.” Diel has largely identified the circuitous path the Codex Mexicanus took on its journey to France. “It’s ironic that the Aztec books that did survive mostly survived because they happened to be sent back to Europe as curiosities.”

Candace Carlisle Vilas, who assisted Diel with research for the book and currently works at the Kimbell Art Museum in Fort Worth, said, “Smaller texts like the Codex Mexicanus produce a history seen through the eyes of the people about their home and heritage before the Spanish invasion. We don’t have a lot of manuscripts before the conquest, which makes the Spanish Colonial ones that much more important.”

To that end, Diel’s study of the Codex Mexicanus illuminates how the Aztecs viewed themselves and their place in the world before and after their crushing defeat at the hand of Cortés. Written by that society’s educated elites living in what would become Mexico City, the codex traces more than four centuries of Aztec history starting in A.D. 1168.

“A lot of people think with the conquest, the Aztecs just die out,” Diel said. “Instead, they begin negotiating what their new status is. Here they had been leaders of this vast empire, when the Spaniards come in and impose a new empire on them. In some ways they hold onto their old traditions, but in other ways they embrace Spanish culture and Christianity.”

RECONCILING TRADITIONS
The Codex Mexicanus offers a window into this new reality, one that had undergone a seismic political, religious and cultural shift. Filled with a mixture of Aztec hieroglyphics and art, the manuscript can be seen as an almanac, delving into a range of topics that would have influenced and shaped everyday life for the upper social echelon of colonial-era Mexico.

Certain parts of the book translate words and pictures into Spanish. Other sections include depictions of the Christian and Aztec calendars with an emphasis on signs of the zodiac. The inclusion of medical astrology, which was widely popular in Europe at the time, alongside genealogies and local histories help make the Codex Mexicanus challenging to categorize. “You need to remember that at the end of the 16th century, 80 percent of the indigenous people have died, and they don’t really
understand that the Spaniards brought the diseases that decimated their population,” Boone said. “This is an age of great trauma, and the Codex Mexicanus takes a European encyclopedic form as a guide for living.”

For those contemporary readers seeking spiritual guidance, the codex also served as a resource for religious beliefs and practices.

“Things get messy in this living document where people were adding to it,” Diel said. “And honestly, it confused me for the longest time. In one section in particular, I could not figure out why they were putting Christian symbols including a crucifix up at the top of a certain page.”

SYMBOLIC SLEUTHING

Diel devoted part of a Harvard University-administered fellowship at Dumbarton Oaks, a research library in Washington, D.C., to solving the mystery. At one point during the fall of 2016, Boone, a past director of pre-Columbian studies at the venerable research library and collection, shared an advance copy of her book on pictorial catechisms with Diel.

“Then it clicked,” Diel said. “I realized I was looking at a translation into the Aztec language of the Articles of Faith. They used signs to spell out the words like a hieroglyphic text.”

Indeed, of the 14 small discs or circles drawn at the top of the page, Diel identified seven as pertaining to God and seven to Jesus Christ as man.

“It was a wonderful discovery,” Boone said. “Not only did it flesh out her project, but it gives us an example of a pictographic catechism that is very early. Lori is an extraordinary scholar who has good vision and great insights, but she’s also extremely careful with her work.”

Diel also sees the manuscript as an important tool for contrasting the artistic styles of the new and old worlds: “The moment the Codex Mexicanus was being created, Europe is going through the Renaissance and their style of art is so illusionistic, whereas the Aztec style is very flat and more simplified.”

Also interesting is a sense of spin Diel inferred from the work. In that, she focused on what was missing from the manuscript. “The Aztec are striving to suppress their violent reputation,” she said. “In the codex, you see them recording how they conquer this city and that city, but they rarely show the [human] sacrifices that go along with that. There is one image where they are victims of the sacrifice, but they never show themselves as sacrificing other people.”

Such a notable absence bolstered Diel’s conclusions that the authors used the manuscript, in effect, “to say they have an Aztec foundation but are becoming a Christian nation just like Spain. In a way they are equating themselves with Rome as the Christian capital of the old world. And they are definitely giving themselves a prestigious history that doesn’t include sacrifice.”

Concurrent with the writing of the Codex Mexicanus, many Spaniards arriving on Mexico’s shores became fascinated with the Aztecs and their history. “There were debates going on in Spain during the 16th century that if the Aztecs are not rational, then they can be enslaved,” Diel said. “But if they are rational, they can be taught Christianity and be free.”

Diel said most of the friars and other Europeans who interacted with the indigenous population in Mexico reported back how rational and civilized they were. “One way of thinking about these two civilizations coming together would be like if aliens were to land on our planet today,” she said. “But there’s also that basic humanity, and the Aztecs and the Spaniards manage to communicate and build this new world together.”

“At its core, the Codex Mexicanus gives us a glimpse into the coming together of these two very different traditions.”

“I realized I was looking at a translation into the Aztec language of the Articles of Faith. They used signs to spell out the words like a hieroglyphic text.”

Lori Boornazian Diel, associate professor of art history

12 TCU ENDEAVORS
Two education professors are investigating ways to enhance parent-teacher collaboration to support positive behavior in schoolchildren. Kathleen Kyzar and Kathleen Strickland-Cohen have been researching family-professional partnerships within Schoolwide Positive Behavior Interventions and Support, a proactive system of strategies to reduce discipline problems. Some schools using the system have reduced discipline referrals by as much as 60 percent, according to a 2010 study in the Journal of Positive Behavior Interventions.

Yet the system’s framework, Kyzar and Strickland-Cohen said, almost entirely focused on schools and lacked data about how the parent-teacher relationship supports positive student behavior.

A 2015 study from the Hammill Institute on Disabilities indicated that families of children with problem behavior are at a greater risk of experiencing stress. A 2007 study in the International Journal of Disability, Development and Education showed that parent-professional partnerships could provide much-needed support.

Education has long had procedures for bringing families and educators together when problem behavior is severe, said Kyzar, assistant professor of early childhood education. The two researchers wanted to cover the continuum by fostering partnerships when problem behavior is mild or moderate.

The student behavior the two professors are studying is persistent but not yet dangerous, said Strickland-Cohen, assistant professor of special education. “We’re looking at things like out-of-seat behavior, like talking out, refusing to engage in tasks when asked — like academic work, withdrawing socially sometimes, not interacting with peers.”

To address the research quandary, the professors designed a strengths-based meeting strategy they called Partnering for Positive Behavior, which uses scripted questions to help teachers and parents of elementary-age students begin a conversation.

“Our research is pointing to the need to get parents and teachers talking before problem behaviors become severe,” Kyzar said. “Parents and teachers are not going to agree on everything, but the approach Dr. Strickland-Cohen and I are testing guides parents and teachers through a process of focusing on areas of agreement rather than disagreement.”

The professors conducted a pilot study with a few parents and teachers from area school districts that already have schoolwide teacher supports in place.

Kyzar and Strickland-Cohen began with the “student’s strengths, what they excel at,” said Katya Medeiros, a fourth- and fifth-grade special education teacher who participated with a class parent.

“Let’s say I ask my students to clean up the blocks that they’re playing with,” Medeiros said. “My expectation is that they will do it themselves. But if Mom says it’s time to clean up the blocks at home, and Mom does it for them, then I know they won’t do it in the classroom. It’s finding what we agree on, and if Mom does everything for them at home, letting [the students] do more at home — finding a middle ground.”

“Their, I think, three parents I was struggling with last year,” Medeiros said. “And I thought, ‘Let’s try it with one,’ and it worked so well I decided to try it with the others.”

Feedback from the study has been overwhelmingly positive so far, Kyzar said. “It keeps us wanting to do this work.”

Strickland-Cohen has shared the results of the research with her students. As she explained, this “gets at why I do what I do. We really want to have an impact on teachers so that we can have an impact on kids.”
A COMMON MUSICAL GOAL

Germán Gutiérrez believes in the power of music to build bridges between TCU and the world.

BY BEATRIZ TERRAZAS

From Latin America to Asia to Europe, Germán Gutiérrez has traveled the globe to teach or conduct orchestral music. But when he was invited to direct the Lebanon Summer String and Orchestra Workshop in 2014, friends and family worried about his safety.

“All anyone hears about Beirut is how unsafe it is,” said Gutiérrez, director of orchestras at TCU, “but that is where we need to go. We need to go to the areas with problems and see how we can help elevate the spirit.”

Gutiérrez’s orchestras perform music from many cultures, and he believes the musical diversity will enrich the lives of students and audience members.

“We need to broaden our horizons,” Gutiérrez said. “The world is connected today. It’s not like 30 years ago that to go to Europe, you [needed] to take an airplane. … We need to know each other. And by getting to know each other, that eliminates the prejudice and the stereotypes.”

When Gutiérrez came to TCU in 1996, he was impressed with Fort Worth’s large Latino population. (The U.S. Census Bureau reported that in 2010 more than a third of the city’s population was Latino.)

“I suggested, ‘We are in a very large Latino community,’” Gutiérrez said of his early conversations with administrators at TCU. “I would like to propose to you to create a Latino-American music center. … But I don’t want this center to be for theory or musicology, but to make Latin American music.”

Rather than a brick-and-mortar building, the center is a virtual network, with the focus on the Latin American Music Festival, a biennial series of free concerts, which started in 1998.

Gutiérrez said he hoped the center and festival would attract “the best students from Latin American countries … and at the same time we give the opportunity to our faculty and our students to get in touch with the best from Latin America.”

Each iteration of the festival is valuable because it’s “great for our students and great for our community,” Gutiérrez said. “We have people living here for years and years, decades, and they might not get a chance to hear … symphonic music from Latin America.”

In addition to teaching at the university, Gutiérrez has been music director for the Youth Orchestra of Greater Fort Worth since 2000. “For me, working with the kids is number one,” he said. “I know that with them, I have to work harder. I don’t have the same result that I have with a professional orchestra.”

But the reward is more personal because what they learn will carry over into any career, he said. “A child in the orchestra learns to respect others. He learns to listen. He learns to speak when he has to speak, when he has the solo. … So when I am working with kids, I’m not just thinking I’m going to have a great concert. I am producing a better human being.”

Gutiérrez, on sabbatical for most of 2017, worked in Hong Kong, Ecuador, Colombia, Peru and Mexico. He frequently teaches at Mexico’s Vicente Fox Center of Studies, Library and Museum in San Francisco del Rincón, Guanajuato.

Eddie Airheart, a doctoral student in conducting at TCU, also traveled to the Fox Center to work with students and conductors. “I’ve had friends that have gone and have worked specifically in Mexico,” he said. “All of them have just come back changed. They’re invigorated with passion for music; their worldview is broadened.

“An orchestra, a band or a choir are the only organizations on earth where people come together to do one thing, and that is to agree,” Airheart said. “And what happens when we agree is called beauty. And that resonates so deeply within me.”

Gutiérrez “has a way of simplifying instruction to a level that can transcend any experience and any idea,” said Marla Ringel, a doctoral student in conducting at TCU. “It speaks to his ability to look at a student, at a musician, instead of looking at the background. … He has such a global sense of what teaching means in that capacity."

The cultural collisions are intentional, Gutiérrez said. He cited Israeli conductor Daniel Barenboim, who, with the late Palestinian writer Edward Said, formed the West-Eastern Divan Orchestra in 1999 as a way to address the Israeli-Palestinian conflict.

“They respect each other,” Gutiérrez said of Barenboim’s musicians. “They are talking with their souls and forget about political difference. … As human beings, there is more that we have in common than what we disagree with.”

Germán Gutiérrez conducts the TCU Symphony Orchestra in the world premiere of Cantata Para la Paz during the Latin American Music Festival in October 2017.
Susan Douglas Roberts once thought virtuosity was about “external achievement, what it looked like.” But the professor of dance spent a 2017 sabbatical exploring “liveliness and the ways in which virtuosity is defined during various eras of a performer’s career.”

Douglas Roberts presented a concert in August that featured dancers older than 40, including herself. “Measuring Time” was inspired by composer Gregory Biss’ tribute to Robert Schumann’s “Scenes From Childhood,” a collection of very short piano pieces.

In deciding to develop the concert, Douglas Roberts said she thought: “What a great challenge it would be to make a very, very short dance and be able to compose a whole idea in a minute, or just over a minute.”

In 2017, Douglas Roberts worked with Biss to compose nine dances about time, each about a minute long. Seven pieces were performed live, two were recorded on video, and all were performed or shown in Maine, where the professor has a home.

Mercy Sidbury, 62, hadn’t danced in 15 years, although she does tai chi and Authentic Movement, a practice in self-directed motion done with eyes closed.

Using slow movements, Sidbury and Douglas Roberts, 60, danced a duet in an expression of trust and weight-sharing.

With eyes closed, Sidbury leaned her entire weight on Douglas Roberts and moved from an upright position to lying on the floor. “She’s just holding me, carrying me until I’m on the ground. … She settled my arm down on my head at the very end,” Sidbury said.

Sidbury said audience members who were caring for aging parents were moved to tears seeing “this one person with eyes open carefully guiding the person with eyes closed who’s giving her weight over.”

Performing again was affirming, Sidbury said: “I didn’t feel I needed to be anything but me.”

Loretta Livingston’s performance was a whimsical dance with tea sets that ranged from demitasse to doll-sized. Douglas Roberts recorded and edited the video.

In some scenes Livingston looks tiny, framed by tree leaves; in others her hands fill the frame. It’s about “extreme variations in scale, because as a child things look very big from our point of view,” said Livingston, 67. “As we grow up, everything shrinks.”

Livingston, who still works as a dance maker and “movement actor,” adjusted her performance to accommodate for a hip injury. She echoed Sidbury’s sentiment, saying, “I did not wear stage makeup. I didn’t try to disguise the way I look. … It is important to be the human being I am.”

Before 2017, Douglas Roberts last took the stage to dance for family and friends when she turned 50. “When I was in my 20s, 30s, even 40s … I just wanted to go onstage with the patterns so ingrained that they were instinctual,” Douglas Roberts said. “But it was more about the movement patterns and not moving the patterns.”

“Measuring Time” showed the professor how capable she is of being present throughout the entire creative process, from rehearsal to performance. “For me, virtuosity now is being able to stay in the moment and move in my body, not move my body.”

Inhabiting the “imagination, the dreams and the expectations of so many in this past year” has inspired her “own sense of possibility and imagination,” Douglas Roberts said. “I feel really lively right now.”
One day in 2009, Nicholas Bontrager pulled a 1957 edition of *Department of the Army Field Manual 21-76* from a bookstore shelf. Its pages sparked an idea that merged two of his passions — the use of graphics and text as teaching tools, and the preservation of those tools with replicas or facsimiles.

The manual is one of many different guides printed by the U.S. Army for its soldiers and “covers everything from how to make a fish trap to what kind of plants you can eat, to wayfinding and navigating,” said Bontrager, assistant professor of art at TCU who specializes in new media. What really caught his eye were the “sharp, clean line drawings” and the “gorgeous illustrations.”

Since then, Bontrager has been using older film cameras — a Calumet 4x5 and a Mamiya C33 twin-lens reflex — to re-create some of the illustrations on film for his “Survival” project. He also uses period objects in his photos for the sake of authenticity. A re-creation of insulating socks required a trip to an Army surplus store where he “found the same type of sock that would have been issued during the Korean War.”

For an illustration of a raft made from gas cans, the professor repaired and repainted gas cans from the 1950s. In subsequent updates the text is similar, but “the Army replaced a lot of those drawings with photos,” said Bontrager. “You lose a lot of those beautiful, hand-drawn illustrations.”

An online search of survivalist websites yielded a PDF of a manual that looks much like Bontrager’s edition. Plant leaves are outlined in black with gentle shading that depicts veins and curves. Others show tents made from ponchos, hammocks made from parachutes and a soldier next to a campfire.


In Outdoor Life’s *The Ultimate Wilderness Survival Handbook, 172 Ultimate Tips and Tricks* (Weldon Owen, 2016), a high-resolution photo of a snarling bear illustrates Tip No. 75: How to survive a grizzly encounter. The 2017 *Army Field Manual 21-76* is there, too, its pages now accented with color.

But the 1957 field manual edition fascinates Bontrager for another reason. Historically, he said, military artwork glorified war, illustrating an army’s size, power and success. Film and print media’s evolution in the 20th century made it possible for artwork “to educate or inform through propaganda or manuals.” That technology changed “the way that we learn or the way that we teach,” he said.

Bontrager has narrowed “Survival” to some 25 illustrations from the 250-page manual, some of which he will re-create as sculptures or film clips. He hopes to receive a grant to finish and exhibit the collection in late 2018. He wants to show viewers the way large organizations “use artwork to teach or educate” and “the intertextual link between contemporary art and the history of graphic training aids.”

In photographs re-creating Figures 183 and 185 from a 1957 U.S. Army field manual, Bontrager stayed true to the objects in the illustrations.
HITTING RESET ON THE THOUGHT PROCESS

An app developed at the Institute of Behavioral Research, and with the help of students, aims to equip probationers with the tools to make better decisions.

BY CAROLINE COLLiER

The saying about big risks leading to big rewards often proves false. Sometimes, embracing risk can lead a person to prison, or to an incurable virus. Or both.

The rate of HIV infection for Americans involved in the criminal justice system is up to five times higher than that of the general U.S. population, reports the Centers for Disease Control and Prevention. The double danger is why scientists at TCU's Institute of Behavioral Research are working to curtail the virus's spread among offenders.

But how to address transmission of a minuscule virus in America's massive, cash-strapped criminal justice system? Could an app developed by TCU behavioral specialists serve as an effective health intervention for at-risk probationers, whose futures hinge on the decisions they will make?

Consider the possibilities:

"I went to this party the other night," an actress explains to her on-screen friend. Eyes downcast, she admits to waking up next to a known philanderer and not remembering what happened. She frets about being exposed to HIV but would rather not know if she is infected.

"The sooner you find out, the better off you'll be," suggests the sympathetic friend. The video ends, morphing into a touchscreen app asking the viewer to think about the scenario and evaluate possible courses of action. The viewer must choose between decisions. Should the actress with holes in her memory learn more about how untreated HIV might affect her body, or should she discuss her fears with a trusted adviser?

Spurring the app's user to consider the possibilities, side by side, is the intervention, a high-tech approach that aims to create new thought patterns. The goal is to teach risk-takers a deliberative method of making decisions.

A HISTORIC SPECIALTY

Psychologist Saul Sells founded the Institute of Behavioral Research at TCU in 1962. From the early days, the institute focused on improving substance-abuse treatment. The group was a key participant in the first national evaluation of public drug rehabilitation, said Wayne Lehman, a senior research scientist at the institute.

Drug treatment and the city of Fort Worth are also longtime associates.

In the 1930s, American heroin addicts receiving public treatment were assigned to one of two federal prison hospitals, known as narcotic farms because fieldwork was part of rehabilitation. One farm was in southeast Fort Worth. It closed in 1971, but several buildings remain across the street from a Tarrant County probation office where StaySafe, the app developed under Lehman's supervision at the institute, is being tested.

Today, as in the 1930s, effective treatment for people who are prone to risky behavior goes back to interrupting their decision-making by introducing more systematic ways of thinking — whether via contemplative gardening or a palm-size computer.

People in general have two ways to make decisions, Lehman said. The first is "experiential, where you make very quick decisions based on your past experience. … You just do what feels good in the moment."

The other, an analytical approach, is more time-consuming but also more effective, Lehman said. Many people don't approach problems by thinking all the way through the options and need to be taught the process.

WORKING THE SYSTEM

In 2008, the National Institute on Drug Abuse awarded a TCU research team a $2.7 million grant to help incarcerated drug abusers pave healthier futures via an analytical thinking process practiced in group therapy settings. The process was similar to a thought-modifying system known as WORK-IT.

A collaboration between the institute and TCU's psychology department, WORK-IT was created in 1994 to help teach better decision-making. People tackle a problem from several angles and then practice making new decisions to create fresh experiences for their memory banks.

Funded with an additional $2.8 million grant in 2015 from the same agency, researchers are in phase two of a project called Sustainable HIV Risk Reduction Strategies for Criminal Justice Systems. For the second phase, principal investigator Lehman and cohorts developed StaySafe, an Android app intended for probationers in drug treatment. Participants use WORK-IT in a virtual environment while sitting in...
“We’re giving [probationers] practice thinking through things.”

Wayne Lehman, senior research scientist at the Institute of Behavioral Research

probation offices.

Analytical thinking can be a transformative tool for people who have been convicted of crimes. Their rates of drug abuse eclipse those of the nonoffending public, said Jennifer Pankow, project director of the StaySafe grant. She joined the institute after spending the early part of her career working in prisons and probation offices.

Probationers are an at-risk group, said Pankow, an associate research scientist, especially if they are in a liminal state between prison and freedom from supervision. Criminal behavior, sexually transmitted diseases and drug use share a commonality: a predilection for embracing risk. “It isn’t just the health risk that they’re dealing with,” she said. “It’s the different challenges around their criminal thinking and their offending.”

Pankow helped train counselors for the first phase of the grant project, which targeted therapy groups in prisons from 2008 to 2014. Designed for inmates about to re-enter society, WaySafe took advantage of free time during incarceration to teach healthy behaviors through group discussion and visual mapping.

WaySafe was effective. After group therapy concluded, participants reported seeking HIV testing almost 1 1/2 times more often than the control group, or those involved in the traditional prison-based health-education programs. WaySafe participants also reported greater knowledge, confidence and motivation about making healthy decisions.

STAYING SAFE

After WaySafe, Lehman, Pankow and research associates wanted to extend their study to reach probationers in court-mandated substance-abuse treatment. The approach had to be quick and simple.

In Tarrant County, around 200 probation officers are responsible for about 20,000 offenders, said Kelli Martin, research unit supervisor for the county’s probation department. In 2017, “Our caseloads have gone up because we have received budget cuts through the state.”

Probation officers, who are called to serve as rehabilitators, have the same goal as the behavioral researchers, Martin said. “We teach people to recognize and pay attention to the way that they think.”

But when one officer is responsible for up to 100 people on probation, some will fall through the cracks. Because of a probation officer’s time limitations, Lehman said, “We wanted something that would be self-administered.”

The researchers designed the StaySafe app around three core design concepts: “Simple, engaging, sustainable.” The app, much like a group discussing new ways of considering consequences, aims to put a wrench in automated decisions, moving those choices from a repetition of prior experience into the realm of methodical analysis.

Researchers said the constraints inherent in tailoring the WORK-IT schema to one person using a tablet were challenging. The previous implementations involved bouncing ideas off of group moderators and members, where people received immediate feedback and drew decision maps to visualize outcomes.

The major obstacle to transitioning to app-based therapy, Pankow said, was “How do we stimulate the participant in a way so that they have to critique their own thinking?”

The solution was StaySafe. The app translates WORK-IT into thought-provoking lessons for someone working alone and receiving no input as to whether or why his hypothetical decisions are wise.

APP TIME

Pankow used her experience counseling offenders to create storyboards based on problems a probationer might face while traversing real-world pitfalls, including telling others about an HIV diagnosis or returning to the dangers of former stomping grounds.

Research assistant Roxanne Muiruri wrote scripts for one-minute videos to bring the potential problems to life. TCU’s Center for Instructional Services helped film theatre students who acted out Muiruri’s roles. The students portrayed risk-takers with lines such as, “I can handle hanging out with my friends without injecting. … I learned my lesson and I’m not going to let them get me in trouble again.”

To offset the approximate $50,000 cost to develop the app for Android devices, the institute’s research team members sought the help of TCU student programmers. As part of a two-semester senior design course in computer science, students take on programming challenges with real-world utility.

A four-person student programming team was assigned to the project and met with the institute scientists most weeks. Because institute researchers created a map of how the app would function, the students were able to focus on programming execution, said Donnell Payne, associate professor of computer science, who teaches the senior design courses. They “were lucky in that this project was very well-defined.”

The young computer scientists learned about working in teams, troubleshooting
and communicating with and presenting to clients, Payne said. Real-world application was a bonus. “Assuming they did a good job and it was working well, this project was going to be used.”

VIRTUAL REALITY

Soon after the app was finished, institute staffers fanned out across Texas with stacks of Android tablets loaded with StaySafe. When probationers entered participating community-supervision offices and one residential treatment facility, a poster advertising the StaySafe risk-reduction study greeted them and offered a stipend for participation.

Seeing a friendly face in the probation offices helped persuade people, said research associate Muiruri. “I practically know everybody by name now.”

In each StaySafe session, the app presents a list of problems related to risky behaviors and allows the person using the app to start making decisions. The user picks a problem and then watches a short video that shows actors faced with a person, place or thing that could trigger a risky decision.

Users then select among four options about how the person in the video might respond. The vicarious experience was an intentional instructive approach, Pankow said, because of the contrast necessitated by different decisions. The app then presents consequences — for several affected people — and mimics the process of mapping out a decision tree.

In a soothing female voice, StaySafe’s digital narrator encourages people, “using just your mind,” to evaluate which option is best for the person choosing it, the person most affected and a helpful person whose advice should be trusted. After thinking through the best decision from several vantage points, the user deliberates about how to prepare for success when a similar situation arises in real life.

Probationers who took an initial survey received $20 toward their monthly fees. The project was offered in select offices from October 2016 through fall 2017 in the three most populous counties in Texas: Dallas, Tarrant and Harris.

Probationers who completed the initial survey were assigned randomly to either a control group, whose members earned an additional $40 for completing two follow-up surveys, or to a group that used StaySafe for 12 sessions. Participants in the latter group could earn up to $220, funds made possible through the federal grant, by working through nine hypothetical problems at a pace no quicker than one each week.

The remaining three sessions focused on HIV facts and were often the probationers’ favorite parts of the experience, Muiruri said. The Centers for Disease Control and Prevention offers the disease data for free on its website, but most participating probationers weren’t visiting public-health websites and were surprised to learn about the statistical correlation between drug use and HIV or that post-exposure HIV prevention exists.

WRESTLING WITH RISK

HIV prevention is the main focus area of the research project, but the decision-making framework can help criminal offenders with a host of risky decisions, from drug use to sexual partners to activities that could land them back in jail, Pankow said. “HIV just happens to be the context that we’re in, but the decision-making framework works anywhere.”

The problems embedded in the app hide the deeper intention, which is a new way of wrestling with risk. App users “practice through this schema over and over again so it becomes much more accessible,” Lehman said. “We’re giving them practice thinking through things.”

The practice component is essential, which is why researchers suspect a participatory app is more effective than traditional educational material. They are now in the process of evaluating how well StaySafe worked in the study. The scientists said they hope the research outcome is the same as when the decision-making tools were given to prisoners in the WaySafe component of the project: more knowledge, confidence and motivation to make sensible decisions.

“Knowledge is not enough,” Lehman said. “Are you motivated to act on that knowledge? And do you have the confidence to be able to avoid risk?”

Pankow, at the request of the National Institute on Drug Abuse, also developed a supplement designed to encourage women to think through female-specific health risks. The app and its digital anonymity have proved useful, she said. “It enables us to provide to an individual sensitive information that in fact they may not be comfortable talking to counselors or probation officers about.”

Lehman is in the process of tailoring StaySafe to restaurant workers, another group of notorious risk-takers. (A 2015 study by the Substance Abuse and Mental Health Services Administration reported the food and hospitality industry as having the highest rates of illicit drug use by employees.)

But the app is ideal for probation offices, Pankow said. “The cost of interventions in these settings is huge. To pay counselors to run groups, this is very expensive,” she said. “To be able to have something that maybe has a small footprint but can be made available at a very low cost is absolutely critical.”

Lehman said the app fulfilled its plan of being simple, engaging and sustainable. And now it is scalable. Once the evaluation portion of the grant is over, the institute is planning to distribute StaySafe for free to any interested probation office in the country.

Although Lehman said he is optimistic about the StaySafe app, he is also realistic. “We don’t expect people to all of a sudden quit making bad decisions. We hope that some will, and some will start making better decisions.”
WOMEN AND WAR
Kara Dixon Vuic examines the evolution of military entertainers in the 20th century.

BY JAMES RUSSELL

For almost two decades, associate professor of history Kara Dixon Vuic has been studying the changing roles of American women on the war front.

One book, several articles and scores of presentations later, TCU’s Lance Cpl. Benjamin W. Schmidt Professor of War, Conflict and Society in the 20th Century said she is still discovering new insights into the intersection of women and war.


During World War I, the American public had a romanticized notion about faraway male soldiers, Vuic said, and no desire for women and war to mix.

The implementation of the Selective Service Act of 1917, commonly known as the draft, increased the likelihood someone would know a military cadet, Vuic said. “Americans began to fear that they were going to send their ‘boys’ to France, where they would get drunk and visit prostitutes.”

To alleviate the concerns of parents and boost morale during the gruesome World War II, organizations such as the Young Men’s Christian Association and Salvation Army formed the United Service Organizations and sent young American women to keep soldiers entertained and preoccupied.

“They try to say: At least I made someone’s day better. At least I can go and say, ‘These guys had a horrible experience … and I helped,’” Vuic said. “Everyone tries to figure out [their roles] through the essential human connection, the base of it all.”

By the end of the 20th century, women accounted for nearly 15 percent of active-duty forces, according to the Department of Veterans Affairs.

“Sexuality is written all over the face of it,” Vuic said. “We’ve always had sexuality as part of the program. These girls are supposed to represent home, good girls. They represent a sexuality that was acceptable. But now you’ve got women in the audience.”

Vuic’s research into how the female presence is changing the war front is necessitating new perspectives on the masculine stereotype of the U.S. military. Part of the reframing might require less sexualized forms of entertainment, Vuic said, because the status quo “offers these two contradictory views of women.”
In Aristophanes’ classic Greek comedy *Lysistrata*, the title character turns female bodies into political weapons by rallying women to withhold sex until warring nations sign a peace treaty to end the Peloponnesian War.

TCU English instructor Layne Craig said she sees parallels between Lysistrata’s tactic and her research on birth control rhetoric in early 20th-century England. Throughout history, “Politics is about women’s bodies,” she said.

Craig’s current project examines exhortations to halt reproduction, or “birth strikes,” for a chapter in the forthcoming book *Women, Periodicals, and Print Culture in Britain, 1890-1920* (Edinburgh University Press, anticipated late 2018). Her segment focuses on arguments from *The Malthusian*, a World War I periodical that encouraged the use of birth control, a controversial stance in an era when religion formed British customs.

The magazine’s publisher, the Malthusian League, was devoted to disseminating the theories of British economist Thomas Robert Malthus, who worried about diminishing resources due to overpopulation. To support its mission, the organization advocated for and provided access to contraceptives.

“This magazine is super important in the history of birth control,” Craig said. “I really was interested in what are the women who are subjects of this discourse thinking.”

Craig homed in on the arguments of female Malthusian contributors who were pro-birth control, including Bessie Drysdale, the wife of Malthusian League founder Charles Vickery Drysdale, and Stella Browne, a well-known radical feminist who advocated for not just contraception, but also abortion.

Drysdale was somewhat cautious, questioning the effect of constant reproduction on women’s bodies. Browne’s suggestion that women have autonomy over their bodies, including the ability to opt for abortions, would have put her in line with contemporary progressive feminists, Craig said.

While Drysdale and Browne helped change the conversation about reproductive culture in early 1900s Britain, their advice was vague, Craig said.

“I was interested in how a birth strike is to be accomplished. I feel like no one gave any instructions. … You can say, ‘Let’s not have any children,’ but what does that mean? Physically, someone has to prevent a child from being conceived. Someone has to abstain from sex. Someone has to get an abortion.”

Craig’s research has influenced the multidisciplinary field of sexuality studies. She penned the book *When Sex Changed: Birth Control Politics and Literature between the World Wars* (Rutgers University Press, 2013) to explain how reproduction became political in the early 20th century.

Aimee Wilson, an assistant professor of humanities at the University of Kansas who also studies literature and birth control, said the tome is “a thoughtful, detailed study of the ways in which literature reflects the changing norms of reproductive control.”

By examining published works about reproduction and contraception, Craig said she wants to further the conversation about how the natural processes of human bodies are described, or avoided, in literature. Authors “are writing about physical — not just historical — people. … That’s what interests me: the reality of bodily functions in stories.”

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“**I was interested in how a birth strike is to be accomplished. I feel like no one gave any instructions. … You can say, ‘Let’s not have any children,’ but what does that mean?”**

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*English instructor Layne Craig*
Each person’s body metabolizes medicines differently, depending in large part on genetic makeup. Pharmacogenomics, which focuses on the relationship between double helixes and drugs, “is basically the study of how genes predict things that are going to happen,” said nurse anesthetist J. Dru Riddle.

Genetic predictions revealed by pharmacogenomic testing are crucial in anesthesia, where responsiveness to strong soporific and analgesic medicines can alter surgical recovery time or even prevent opiate addiction.

The science explaining how drugs and genes interact is solid, said Riddle, assistant professor of professional practice in the Harris School of Nurse Anesthesia, “but there’s not a lot of uptake of that science on the clinical side of things.”

Do nurse anesthetists understand pharmacogenomics’ potential for delivering optimal doses of pre- and postsurgical drugs, tailored for an individual’s genetic signature? Since no one had done a comprehensive analysis of professional attitudes in the field, Riddle designed a survey to gauge knowledge and assumptions about pharmacogenomics.

To guide survey development, Riddle arranged interviews with nine nurse anesthetists and one anesthesiologist in North Texas. He said the respondents, on the whole, reported not using the testing. Some of the medical professionals didn’t have access to laboratories capable of analyzing personal genomes in a drug-based context. Others overestimated the cost of testing, which runs a few hundred dollars on average.

Riddle distilled their explanations for not embracing the technology into seven key themes, including ethical concerns and confusion over how to make use of the data. He then translated those themes into a 14-question Likert-type survey that he distributed to 6,000 certified registered nurse anesthetists in a national database.

The survey results, published in the journal Pharmacogenomics, reiterated much of what the original respondents said: Medical professionals need additional training on how to understand pharmacogenomic test results and how to apply them in clinical practice.

“People were very interested in trying to figure out how to actually use [pharmacogenomics],” said Riddle, who also directs the Center for Translational Research at TCU.

The School of Nurse Anesthesia is applying Riddle’s research findings in its curriculum so future practitioners will have pharmacogenomic knowledge when they acquire prescriptive power. “We’re starting in the classroom now because it’s much easier to introduce it into practice than to change practice,” Riddle said. “If it’s not scary, people will get it.”

TCU’s Harris College of Nursing & Health Sciences also covers the basics of pharmacogenomics in the undergraduate nursing curriculum, said Kathy Baker, associate professor of nursing, who advised Riddle on the study design.

“IT’s very foundational, but at least it’s not foreign to them,” she said. “Hopefully as they enter into their focused practice areas, they’ll begin to at least pay attention to the pharmacogenomics specific to their area of practice.”

By covering the new approach to pharmacology, Harris College is helping students get an early handle on tomorrow’s health care routines, where personalized medicine will be the norm, Riddle said. “I would say certainly within the foreseeable near future, so in five to 10 years perhaps, we will see pharmacogenomic testing used almost always in every patient.”

J. Dru Riddle of the Harris College of Nursing & Health Sciences measured opinions among certified registered nurse anesthetists about pharmacogenomic testing.
Nada Elias-Lambert wants to prevent another tragedy similar to what reportedly happened to Kitty Genovese more than 50 years ago.

The 28-year-old woman’s murder in New York City prompted social work researchers to ask why none of the almost 40 witnesses intervened. (The initial New York Times report has come under scrutiny, but the 1964 crime remains a seminal case in studies on bystander intervention.)

Elias-Lambert, assistant professor of social work and director of TCU’s Master of Social Work program, studies how best to train faculty to become effective bystanders who are prepared to intervene in violent situations. Her research focuses on methods of improving intervention training for faculty and understanding why her colleagues in academia want to learn these skills.

Faculty members can be key in preventing violence in university settings, Elias-Lambert said. The research is timely, as reports of campus sexual assaults are on the rise nationwide. In fall 2017, the U.S. Department of Education was investigating around 350 cases of sexual violence on college campuses.

As the faculty bystander intervention program coordinator at TCU’s Koehler Center for Instruction, Innovation, and Engagement, Elias-Lambert puts research into action by teaching her peers how to avert potentially dangerous situations. The center strategizes with professors to improve overall classroom experience.

The training sessions involve two workshops, each about two hours. The first one provides an overview of intervention strategies, known as the five bystander steps, as well as a review of reporting guidelines at the federal and state levels. The second session trains faculty members to lead workshops in their home departments by using language that colleagues within their disciplines will understand.

“I might present it in a way social workers get it,” Elias-Lambert said. “But would an engineer get it?”

The researcher also is conducting follow-up surveys to examine faculty motives for attending. “Faculty members are usually extremely busy. This doesn’t fit very cleanly anywhere for them, yet it’s a decent time commitment. And there is risk involved,” Elias-Lambert said. “You are presenting to colleagues about a topic it is not easy to talk about. If [we] are going to recruit faculty to participate, I want to see how we can continue to engage faculty.”

Specializing in intervention strategies also means tackling misperceptions on what it means to intervene in the first place. “We initially think, ‘I have to put myself in harm’s way in order to change the situation.’ That’s not true at all,” Elias-Lambert said. “We can talk about the direct and indirect ways to be a bystander. So, if I see someone having an altercation and say, ‘Hey, do I know you?’ or ‘Hey, where’s the library?’ I don’t have to insert myself, but it can change the course of the situation.”

Learning which aspects of faculty intervention training are most effective and measuring the impact on campus violence could have far-reaching effects, said Beverly Black, a fellow social work scholar. “This research is sorely needed and promises to offer important information. Colleges and universities around the country will undoubtedly be eager to examine her findings,” Black, the Jillian Michelle Smith Professor in Family Violence Research at the University of Texas at Arlington School of Social Work, wrote in an email.

As faculty members learn intervention strategies, they can apply the skills to confront a multitude of risky situations, Elias-Lambert said. “The nice thing is once you know the research skill set, it can apply to racism, heterosexism and academic misconduct. If you see a student in class cheating on an exam, might you want to say something? How might you want to handle it? The skills are the same across any of these risky situations or behaviors.”

Five steps for bystander intervention:

1. Recognize that risky behavior is occurring
2. Identify that a potential victim is at risk
3. Decide whether to intervene
4. Decide the best and safest way to intervene
5. Implement a decision to intervene safely

Source: Nada Elias-Lambert
As companies like Equifax, Target, The Home Depot, eBay and Sony can attest, a successful public apology after a data breach involves more than a hasty “sorry.”

In graduate school, Joshua Bentley began studying the effectiveness of corporate apologies. Now an assistant professor of strategic communication in the Bob Schieffer College of Communication, Bentley has identified four tactics companies can take to make their apologies resonate with consumers after large-scale hacking.

“What is particularly interesting about the data breach situation is that it’s more ambiguous about who is to blame,” Bentley said. “The highest responsibility resides with the hackers; these companies didn’t want the breach.”

Nonetheless, consumers find fault with corporations that failed to secure their sensitive information. Bentley’s research indicates that corporations can exercise considerable sway over consumer sentiment, depending on their apologies.

“The theory that dominates the work of public relations researchers and people who study crisis communication is that different types of situations call for different responses,” Bentley said. “You can’t type up a one-size-fits-all apology.”

Nonetheless, consumers find fault with corporations that failed to secure their sensitive information. Bentley’s research indicates that corporations can exercise considerable sway over consumer sentiment, depending on their apologies.

“At the annual conference of the Association for Education in Journalism and Mass Communication in August 2017, we have seen that companies can almost make the situation worse if they don’t do the apology right,” Ma said.

Bentley, who assessed responses from experimental design studies involving more than 1,600 participants, said, “If managed improperly, crises like data breaches can destroy the relationship between an organization and the stakeholders upon whom it depends for survival. But it is also remarkable how often apologies succeed.”

Bentley and Ma identified four elements critical to the success of an apology: expression of remorse, acknowledgment of responsibility, promises of forbearance (i.e., delineating steps a company can take such as hiring new security experts to make sure the problem doesn’t happen again) and offers of reparations.

“Reparations or some kind of compensation might not repair the damage, but it invests in the relationship,” Bentley said. “A company could go as far as offering free monitoring of credit for a year or sending a customer a gift card to shop at their store. Either way, it makes people feel a lot better about the company.”

What often backfires are apologies laced with jargon or too obviously vetted by a team of legal experts. “There’s a certain art to expressing genuine regret for what you did, and that can be even trickier in the murky waters of a data breach, where the company is only partially at fault,” Bentley said. “But an apology is uniquely powerful in showing that you care about other people, and when done right, the public is usually willing to let the matter drop.”

Strategic communication expert Josh Bentley researches public apologies. A recent project looked at organizational mea culpas after massive data breaches.
Hearing problems?

There’s an app for that

Computer scientist Liran Ma is developing a program so an iPhone can function as an inexpensive hearing aid.

BY CAROLINE COLLIER AND MIKE DEL VECCHIO

WIDESPREAD PROBLEM

When Liran Ma’s mother visited Texas from China, the associate professor of computer science said he noticed her hearing was deteriorating.

Mother Ma, whose name is Ziyun Wang, is not alone. The Hearing Loss Association of America reports that as many as 48 million residents in the United States alone suffer some degree of hearing loss. By 65, at least 1 of every 3 people is moving in the direction of deaf.

Current hearing aid options are expensive and complex, Ma said. Devices cost an average of more than $2,000 per ear, and most private insurance companies — as well as Medicare — do not pay for them. Only 1 out of every 5 Americans with hearing loss uses a hearing aid, Ma said, and “cost is a significant barrier.”

Liran Ma, computer science professor
A SOUND IDEA

Ma, whose primary research interest is in network security, decided to develop an iPhone app, using Apple’s built-in sound-processing tools and a pair of headphones, to work like a hearing aid at a fraction of the cost.

The professor needed to learn how hearing aids work and, by default, how humans hear. At first, he said he assumed, “You just have to amplify the sound to a level that’s sufficiently loud for them so that they can hear again.”

The task would not be so simple.

LOSING HIGH FREQUENCIES

Hearing loss discriminates among frequencies. The cochlea cells, which vibrate to transfer sound information to the brain, begin dying at the outside of the inner ear, and those outer cells are responsible for high-frequency sounds.

NECESSARY CONSONANTS

The loss of high-frequency hearing is a problem, as the sounds made by consonants register in the upper frequencies. People who cannot hear consonants have difficulty distinguishing between hard sounds, such as ‘S’ or ‘SH.’ Consonants often differentiate words, enabling listeners to tell the difference between cash and class, or pig and big, for example.
A FAST TRANSFORMATION

To amplify just the high frequencies, the app needed to break sounds apart.

For the mathematics behind manipulating portions of sound waves, Ma and his student research assistants sought the wisdom of Ken Richardson, professor of math at TCU. He taught them properties of the fast Fourier transform, an algorithm that can convert sound from time ranges to constituent frequencies, simplifying manipulation of specific frequencies.

A phone’s processor can only handle so much sound at once, leaving a small discontinuity between processed segments. The app also needed to reduce noise. Filtering out background chatter allows the listener to focus on the desired sounds.

The app incorporated a “partition of unity,” which Richardson said “allows one to piece together things that are not smooth and create something smooth out of it.”

The total processing has to happen in a flash. If the delay between sound emission and hearing is more than 50 milliseconds, confusion and disorientation can result due to visual experiences being out of sync with audio.
HAPPY TO HEAR

The professor is still waiting to do a formal trial, but his mother is now using the app in China. She promises it works great, Ma said.

Helping his mother and other people with age-related hearing loss is a good reason to spend so much time on his side project, Ma said. “If you cannot hear, it’s like living in the dark. … I want people to see the light again … so I will make the app easily available at a much lower cost.”

FUTURE TECH

Ma said he is planning future enhancements for the app, including situational awareness, which will rely on location-based data to estimate the average noise level around a person.

And instead of frequent trips to an audiologist to adjust a hearing device, the app will include “automatic fitting,” which instructs the user to say a sentence aloud and then makes changes.

“Based on [the listener’s] preference, the app can dynamically adjust the parameters,” Ma said.

“I want people to see the light again … so I will make the app easily available at a much lower cost.”
When you arrived at TCU in 2009, you established a research team of students who have an interest in the modeling aspect of physical chemistry. Why is TCU a good place to lead such a team?

TCU has, I believe, the second-oldest chemistry PhD program in the state of Texas. For a relatively small program, it is very strong and has done some good things. I think there is a real institutional commitment to recognizing that good education comes about when the educators are also doing good science.

TCU recognizes that a good undergraduate education is going to be strengthened by having good research being done in the department. They recognize that the best thing that they can do for undergraduates who are trying to go into chemistry is to bring them into an environment where there is real research being done.

We have been lucky to have some great undergraduate students. Some have been very chemistry-oriented and wanted to make pictures of molecules and see how they interact. Others have been more physics-oriented and have wanted to write computer code for parts of the projects.

What do you and your students in the Janesko Research Group in Theoretical and Computational Chemistry study?

We don’t do experiments in the group. We don’t have trays full of chemicals. We don’t have fume hoods. What we try to do is use models of the kind of reactions that our colleagues are doing to do accurate calculations on those models and ask if our ideas about that system make sense. Can we suggest something new to do for an experiment in the future?

The big idea is that we want to help experimentalists focus their resources on experiments that are most likely to succeed.

For example, if you want to design a new drug molecule that is going to bind to a protein and change how it acts, there are an enormous number of molecules that you could synthesize. This is part of the problem with modern drug design, that you might have to try tens of thousands of molecules before you find ones that work. One of the reasons the cost to bring a new drug from idea to market is so high is because they have to do a ton of experiments on things that end up not working.

Computer power is cheap, and calculations can be cheap. So we can use calculations to help guide us to the most useful experiments to do next. We do our best to make sure that the next experiment we do is the most likely to be successful.

What does the development of accurate approximations mean for science?

If we want to model a molecule that an organic chemist cares about, it would take a lifetime for a nearly exact calculation to finish. So we have to make approximations. But our approximations still have to be accurate.

One example comes from our collaboration with [Robert A. Welch Professor of Chemistry] Eric Simanek’s group. They are developing dendrimer scaffolds for delivering drugs into the body. The scaffolds protect these toxic drugs and release them at some controlled rate. We used these approximations to predict the rate of one step in the release. Our calcula-
tions predicted that the new scaffolds that the Simanek group was building have unusual behavior in acidic environments, possibly like the environment inside a tumor. Their experiments validated the calculations, and now we’re exploring how to use that behavior for real drug-delivery systems.

What other notable discoveries have come from the Janesko Research Group?

We came up with a tool for looking at the sizes of orbitals. If you take a freshman chemistry course, you will talk about how electrons go in orbitals, and if they are big and puffy they will overlap with other ones very promiscuously and do a lot of reactions. If they are small and compact they will do different kinds of reactions. We happened to find a tool that shows that kind of thing really well. My graduate student Arshad Mehmood and I just published a paper showing that those methods can be useful for modeling real chemistry.

Another of the discoveries we made involved metal clusters. There are a lot of experiments on metal clusters, particularly gold clusters. These can be used as prototypes for industrial catalysts. Understanding their chemistry has practical implications. You can do experiments on them by ionizing them. One of the things we found is that one of these clusters looks like a hexagon with an atom in the middle. We were able to explain that the atom in the middle is actually the least stable one. So that’s the one that pops up and gets replaced if you have anything else around. We are really trying to push using those tools in a number of different areas.

You are part of a million-dollar grant project funded by the Qatar National Research Fund. How did the partnership arise?

The state of Qatar has made a strong investment in education. One of the investments they have made is to try to set up branch campuses of U.S. universities. The project that I work on is a collaboration with lead author Ed Brothers at Texas A&M [University at] Qatar. We’ve had an ongoing collaboration to use our systems to look at chemistry on surfaces. These are really important because metal and metal oxide surfaces are used as catalysts for just about any kind of reaction you can think of. Understanding how chemical bonds form and break on surfaces has really practical applications for a lot of industrial chemistry.

In Qatar, they have very large natural gas reserves, and they have the largest plants in the world for converting natural gas into liquid transportation fuels. They have a lot of interest in refining that chemistry. These kinds of reactions have been around for a hundred years, but we still don’t know everything we need to know about them. Dr. Brothers and I are developing new electronic structure approximations and testing them to try to better understand the mechanism of the reaction. Ultimately, can we make suggestions to experimentalists on new ways to tune the catalyst to change the product distribution?

— Jacob Smith

Editor’s Note: The questions and answers have been edited for clarity and length.
Industrial Sexuality: Gender, Urbanization, and Social Transformation in Egypt
BY HANAN HAMMAD, ASSOCIATE PROFESSOR OF HISTORY AND DIRECTOR OF MIDDLE EAST STUDIES
UNIVERSITY OF TEXAS PRESS, 2016

Egypt's working poor became factory employees in the years between the two world wars. Hanan Hammad searched court records, archives of the royal palace and oral histories for the material in this never-before-told social history. Urbanization meant thousands of men, women and children were at work under the authority of unfamiliar men — intensifying sexual harassment, child molestation and prostitution. Hammad explains how the evolution of the workplace played a role in shaping Egyptian modernity. The book has received several accolades, including the Sara A. Whaley Prize, given annually for writing on women and labor.

Feverland: A Memoir in Shards
BY ALEX LEMON, ASSOCIATE PROFESSOR OF ENGLISH
MILKWEED EDITIONS, 2017

Seeking goodness while battling the demons of his past provided inspiration for poet Alex Lemon’s second work of nonfiction. Feverland is an experimental, fragmented memoir about what it means to be a man in 21st-century America. Lemon asks how a man can be a caring partner and parent when he has little tenderness for himself. Disjointed images of life flicker through the pages, including wildfires in Southern California, rats in Texas, childhood abuse, dreams of tigers, blackout nights and a son born in a shadowy hospital room.

These Are Our Demands
BY MATTHEW PITT, ASSISTANT PROFESSOR OF ENGLISH
ENGINE BOOKS, 2017

Described as whimsical and gutsy, Pitt’s 12 narratives depict characters hoping for new chances in life. Some realistic, others fabulist, the tales include an attempt to colonize the moon because of a tourist scheme gone awry and a town populated by blind bluesmen awaiting their lovers. The satire of the collection explores how life on the margins opens a door to a space beyond polite society.

Learning Legacies: Archive to Action Through Women’s Cross-Cultural Teaching
BY SARAH RUFFING ROBBINS, LORRAINE SHERLEY PROFESSOR OF LITERATURE
UNIVERSITY OF MICHIGAN PRESS, 2017

Robbins spotlights women writer-educators of the past whose stories can inspire today’s community-building efforts. One chapter highlights work by African-American teachers and students at Atlanta’s Spelman College. Another revisits settlement-house collaborative learning in urban Chicago. Robbins also honors the nurturing educational models of Native American women.

Diasporic Identities Within Afro-Hispanic and African Contexts
EDITED BY YAW AGAWU-KAKRABA AND KOMLA AGGOR, PROFESSOR OF SPANISH AND HISPANIC STUDIES
CAMBRIDGE SCHOLARS PUBLISHING, 2015

In an era of unprecedented human migration, Diasporic Identities ponders the complex identities formed by people of African ancestry in the Spanish-speaking world. Should diaspora be limited to migration that is voluntary, or should it include exile? What about generational differences? How does diaspora relate to creolization, hybridity and transculturation? The book’s essays look at people in Cuba, Nicaragua, Morocco, Angola and Spain.

They Came to Toil: Newspaper Representations of Mexicans and Immigrants in the Great Depression
BY MELITA GARZA, ASSISTANT PROFESSOR OF JOURNALISM
UNIVERSITY OF TEXAS PRESS, 2018

Garza’s book explains how three daily newspapers, the Hearst-owned San Antonio Light, the then-independent San Antonio Express and the Spanish-language La Prensa, covered the forced deportations and racial “othering” of Mexicans and Mexican-Americans during the Great Depression. Her study of these narratives adds a chapter to the history of the Long Civil Rights Movement and brings historical context to immigration issues.
EDITED BY DAXTON "CHIP" STEWART, ASSOCIATE DEAN AND ASSOCIATE PROFESSOR OF JOURNALISM
ROUTLEDGE, 2017

Social media platforms such as Facebook, Twitter, Instagram and Snapchat have transformed communication, presenting challenges for professionals in journalism, public relations and advertising. Stewart’s guide deals with privacy, libel, copyright, online harassment and organizational social media policies. The second edition contains 13 updated chapters by media law and ethics scholars and two new chapters — one on ownership of social media accounts and another anticipating future free-speech issues.

BY JANACE BUBONIA, CHAIR AND PROFESSOR OF THE DEPARTMENT OF INTERIOR DESIGN & FASHION MERCHANDISING
BLOOMSBURY PUBLISHING, 2017

In this updated edition, Bubonia defines the materials and terms related to the mass production of apparel. She covers design and product development, garment details and component parts, fit and patternmaking. In this edition, chapters have been reorganized to better follow the supply-chain flow. New content includes safety compliance, new technologies and an enhanced global focus.

Doctoral Research
A selection of TCU’s doctoral research projects
BY ELAINE GARRISON

MICHAEL ANTHONY GOMEZ, PhD candidate in history
“MANUFACTURING A COMMON CULTURE: THE RISE OF MEXICO CITY’S PULQUE INDUSTRY WITH THE LABOR OF THE RURAL LOWER CLASS”
Gomez explores the development of the pulque industry in colonial Mexico. His paper highlights one hacienda owner’s agave-farming operation that produced the alcoholic beverage by fermenting Agave Americana juice. Gomez looks at laborers who worked the land, produced the pulque and transported the finished product to Mexico City’s markets, and connects the urban and rural spheres of social drinking cultures.

HEIDI HAKIMI-HOOD, PhD candidate in English
“CULTIVATING THE APPLE AND EATING IT TOO: PRESERVING NATIONAL IDENTITY THROUGH SCIENTIFIC INTERVENTION”
Victorian scientists, anxious to preserve the apple for posterity, created new varieties with the help of knowledgeable gardeners. Hakimi-Hood’s paper, presented at the North American Victorian Studies Association in Banff, Alberta, argues that Victorian apple-farming conditions were deeply affected by the interplay of scientific intervention and emerging tastes for flavors.

DREW CIAMPA, PhD candidate in astrophysics
“SUPERNOVAE EXPLOSIONS IN THE LARGE MAGELLANIC CLOUD DRIVE MASSIVE WINDS TOWARD THE MILKY WAY”
Ciampa is conducting original research on explosions in the Large Magellanic Cloud, a satellite galaxy, that drive a massive wind toward the Milky Way. He presented his findings at the National Institute of Astrophysics, Optics and Electronics in Tonantzintla, Puebla, Mexico.

YING WANG, PhD student in curriculum studies, and MILA ZHU, PhD candidate in curriculum studies
“DEAR CLAUDE: A DUOETHNOGRAPHY OF IDENTITY AND DISPLACEMENT”
Wang and Zhu presented two sessions at the Bergamo Conference on Curriculum Theory and Classroom Practice in Dayton, Ohio. They co-authored “Dear Claude,” which discusses self-identification, cross-boundary education and learning English. Each also presented a second paper on teaching qualitative research methods.

JENNIFER MCCUTCHEON, PhD candidate in history
“GUNPOWDER DIPLOMACY: TRADE, ALLIANCE FORMATION, AND CREEK INDIAN POLICYMAKING IN THE ATLANTIC WORLD, 1670-1783”
McCuthen’s project explores how Europeans and Creek Indians used gunpowder, a valuable commodity, as a tool of cross-cultural diplomacy and political negotiation in the 18th-century Southeast. The paper was presented at the American Society for Ethnohistory conference in Winnipeg, Manitoba.