



# MIND'S EYE

Missouri  
State  
UNIVERSITY

OCTOBER 2019

## WHAT IS YOUR MIND'S EYE?


Your Mind's Eye is where you find inspiration. It is why you approach a problem differently. It allows you to see things in a new light.

At Missouri State University, our faculty conduct hundreds of research projects each year. They search, dig, dissect, analyze, innovate, design, seek and discover. They see things the way they could be. They propose solutions to global issues.

Dive deeper into a few of these research projects in this issue of Mind's Eye.



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Sitting at a piano, Lisa Brescia begins her warm up for her performance in Broadway's "Dear Evan Hansen"

# On Broadway



**Crowds line the street outside New York City’s Music Box Theatre, which houses “Dear Evan Hansen.”**

“I typically arrived at the theater 90 minutes before the curtain went up,” Lisa Brescia said. She then moved through her yoga warmup and vocal exercises.

This happened eight times a week at New York City’s Music Box Theatre as Brescia prepared to take the stage in the Broadway smash “Dear Evan Hansen.”

It was the seventh Broadway production for Brescia, assistant professor in the department of theatre and dance. Before joining Missouri State in 2016, she wowed audiences as Donna in “Mamma Mia!” and Elphaba in “Wicked.”

Brescia took an artistic leave from Missouri State, which allowed her to accept the contract with “Dear Evan Hansen.” She played Heidi, the title character’s mom.

Brescia described Heidi as “very flawed. She’s not killing it as a mom at all, but there are reasons for that. There’s a whole history that led her to the very moment the play begins.”

**HOW SHE FOUND HER CHARACTER**

Exploring and inhabiting such history is a cornerstone of Brescia’s acting technique, which she teaches to her advanced acting students.

She requires them to get very specific about the given circumstances of their characters’ lives. Brescia’s students create extensive autobiographies for their characters, thoroughly defining the world in which the characters

live. Such specificity, Brescia said, leads to the truthful behavior that’s central to good acting.

“So for instance, if I have a line about a childhood pet, say a dog named ‘Fox,’ I create a whole history for that,” she said. “Then when I’m on stage and I mention Fox, I’m actually experiencing a fully-realized memory, which enlivens the work.”

As Brescia prepared for “Dear Evan Hansen,” she dug deep into the world of Heidi, a single mom trying to provide for her 17-year-old son. In addition to working full time at a nursing home, Heidi is attending night school to become a

Each of these circumstances, Brescia said, contributed to her understanding of Heidi as “a very shame-based person.” The character seems hounded by the sense that she’s falling short; as Brescia put it, “she’s kind of embarrassed to be her. But she’s working so hard.”

And despite — or perhaps because of — this insight, Brescia developed deep affection for her character. “I see her as someone who’s constantly willing to show up for everything and do her best,” Brescia said. “As imperfectly as she does, she still shows up.”

**EMOTIONAL ACCESSIBILITY**

“Dear Evan Hansen” tackles complicated issues, such as mental illness and suicide. It approaches these hot buttons with openness and honesty, and audiences typically respond with enthusiasm.

Brescia knew this show called for emotional accessibility, but even amid highly charged moments, she kept her focus on telling the story.

“When actors are swimming in feelings, it can make us think the scene must be great,” she said. “But

our job is to be full of those feelings and then put our attention on our scene partner. We have to make it about fighting for something.” She often reminds her students to ask, “What am I doing?” rather than “What am I feeling?”

And for Brescia, the chance to tell high-stakes stories like “Dear Evan Hansen” is a benefit of her work.

“

**MY JOB IS TO TELL THIS STORY, WHICH IS VERY EMOTIONALLY LOADED, IN A WAY THAT REACHES THE AUDIENCE.**

”

paralegal. She hopes this effort will improve her career trajectory and by extension, her sense of self-worth.

“She’s trying to juggle it all, and she’s flailing,” Brescia said.

And even though Heidi is a devoted mother, Brescia saw her “sometimes needing her son more than he needs her — or at least asking more from him. In some ways, she’s dependent on him.”





Photo Credit: Matthew Murphy

**Andrew Barth Feldman and Lisa Brescia perform as Evan and Heidi Hansen in the production of “Dear Evan Hansen.”**

“I believe we all walk around with complexity and pain and grief inside,” she said. “I get to let it all out and leave it on the stage.”

**PHYSICAL STAMINA**

Performing in a Tony Award-winning show like “Dear Evan Hansen” required Brescia to deliver a consistently excellent experience — eight times each week.

This took physical stamina, particularly because she was performing on a raked stage, which means the stage platform itself was built on an angle with a downward slope toward the audience.

“It’s prettier from the audience’s point of the view,” Brescia said. “Because of the angle, they can see all the beautiful stage pictures.”

As an actor working onstage, however, she had to be cognizant of the effects.

She explained, “Cumulatively, for the skeletal structure, it’s as though you’re working in really high heels all the time. The leg muscles and the IT bands tighten, and the knees can get pulled to the side. For me, this causes knee, leg and back pain.”

To combat these issues, Brescia took advantage of physical therapy sessions provided for the “Dear Evan Hansen” cast by its producers. She took additional steps to maintain her strength and alignment by scheduling regular massage and chiropractic treatments and by properly warming up for each performance.

It helped that her character was costumed in “regular clothes,” including medical scrubs.

She laughed remembering how this contrasted with a previous experience. “When I played Elphaba in “Wicked,” I spent Act 2 performing in a 50-pound dress!”

**BACKSTAGE LIFE**

When asked what people might find surprising about her experience in “Dear Evan Hansen,” Brescia described the contrast between the “pretty, glossy pictures” onstage and the constant motion occurring backstage.

“There were so many people involved in making what happened on stage look good and run smoothly: the stage managers, the company managers, the stage crew, the wardrobe crew, the hair crew, automation technicians, the

spotlight operators, the house staff and box office personnel who serve patrons.”

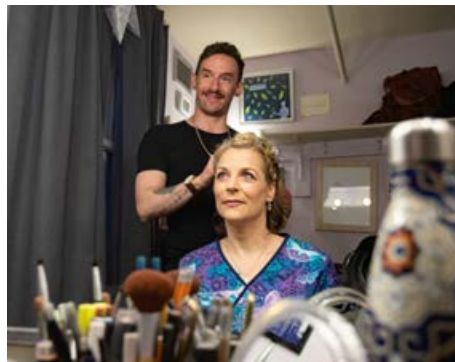
And with such a large group collaborating to make the show happen, the backstage choreography was just as intricate as what was happening out front.

She recalled, “I knew exactly where I needed to be so I would not be in someone else’s way. At the same time, it’s really fun back there. We’re all pros, which means we’re focused, but certainly not glum.”

And the relationships, she said, grew very close. For example, “Most days, I spent more time with my dresser and hair person than I did with my husband. My dresser was with me as I changed clothes. It’s an intimate profession, and dressers must have sensitivity and intuition. When I walked off stage drenched in tears from an emotional scene, my dresser was there.”

Now, Brescia is happy to be back in the classroom with her students. She looks forward to what the future will bring — certainly more acting work and possibly some new paths as well, such as directing.

“I believe in sort of universal forces, like a warm hand on my back, pushing me through my fears and saying, ‘You are supposed to do this. Keep walking; just keep walking.’”



**Daniel Mortensen, former hair supervisor for “Dear Evan Hansen,” secures Lisa Brescia’s wig backstage as she transforms into Heidi Hansen.**

BY LUCIE AMBERG  
PHOTOS BY KEVIN WHITE



“

**LISA SETS PROFESSIONAL EXPECTATIONS FOR HER STUDENTS, AND SHE DOES IT IN A CARING WAY. IT'S LEADERSHIP BY EXAMPLE, AND THEY RISE TO HER EXAMPLE.**

**- DR. KURT GERARD HEINLEIN  
COORDINATOR OF ACTING PROGRAM**

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Lisa Brescia looks out at the New York City skyline as she warms up for her performance of “Dear Evan Hansen.”





Dr. Robert Pavlowsky (front) with students Joshua Hess, Annie McClanahan, Madeline Behlke-Entwisle and Grace Roman in the Mark Twain National Forest.

# Securing natural resources for the Ozarks





The Ozarks region is known for its rich natural resources. Forests. Lakes. Rivers. Streams. And they're all interconnected.

Proper management of these natural resources ensures that they'll be available for people to enjoy for many years.

Dr. Robert Pavlowsky has worked on nearly 100 projects related to water quality in the Ozarks region of southern Missouri and northern Arkansas. He is the director of the Ozarks Environmental and Water Resources Institute (OEWR) and a distinguished professor of geography.

The institute supports efforts to protect and restore water quality and supply in the Ozarks. Since it was created in 2004, the institute has administered 86 grants worth almost \$5 million.

"Our research is focused on helping managers understand the effects of their management programs on the landscape, stream behavior and floods," said Pavlowsky. "We also give the managers third-party support so that their decisions have scientific backing."

**“ I’M A GEOGRAPHER, WHICH MEANS WE VIEW THE WORLD AT DIFFERENT LEVELS. WHEN WE FOCUS ON UNDERSTANDING A WATERSHED, WE ALSO WORK WITH THE UPLANDS, HILL SLOPES, FLOODPLAINS, STREAMS AND LOCAL COMMUNITIES. ”**

### PRESCRIBED BURNING

One current project Pavlowsky leads is assessing the impact of prescribed burning in the Mark Twain National Forest.

The U.S. Forest Service contracted with the institute to see whether prescribed fires are increasing soil erosion and harming water quality in the area.

Pavlowsky and about a dozen students have been monitoring rainfall, soil conditions, runoff channels and water flow within the Big Barren River watershed in Mark Twain National Forest.

"So the question is," said Pavlowsky, "does prescribed burning increase runoff from forest soils and cause more flooding and pollution downstream?"

Preliminary results indicate a small improvement in soil conditions one to two years after a burn, compared to unburned sites. This positive effect, in turn, leads to less runoff and soil erosion and ultimately decreases water pollution in the watershed.

### OPPORTUNITIES FOR STUDENTS

Interest has moved to other parts of the watershed. "We're also looking at stream channels because they connect the forest areas, and what washes off them, to larger creeks downstream with year-round water and aquatic life," said Pavlowsky.

Graduate student Grace Roman is evaluating the headwater channels for her thesis. The research is in a sub-specialty called fluvial geomorphology. It is the study of the form and function of streams and the interaction between streams and the landscape around them.

"One of his previous students studied how prescribed fires affect soils," said Roman. "So we've gone from upland soils to the water in the stream. And then I'm sure he'll have someone looking further downstream to see any effects from prescribed burning."



**Grace Roman performs a ground cover assessment in the Mark Twain National Forest.**

### PAYING IT FORWARD

Pavlowsky involves students in most of his research. Since coming to Missouri State in 1997, he's mentored well over 150 undergraduate and graduate students.

He sees student involvement as core to the university's, and his own, mission.

"MSU's mission is more to educate students in research rather than to produce faculty that dominate in their fields — although some do," he said.

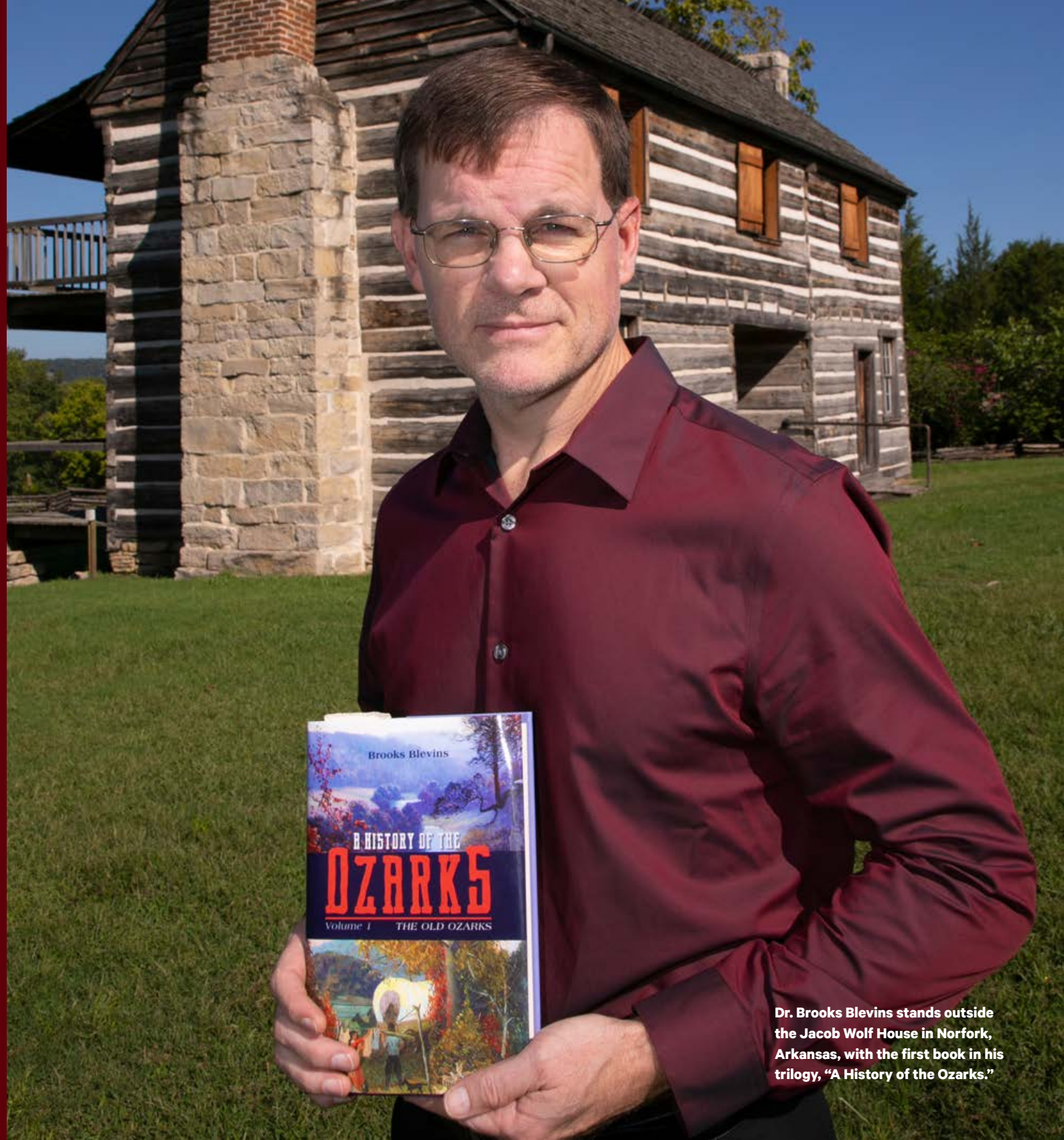
"I love working on research problems with students. When I was in graduate school, one of the aspects that really affected my future career was noticing that faculty — who were busy, good teachers and talented researchers — took time to work with me, and to mentor me along."

### LARGER IMPLICATIONS

While most of Pavlowsky's research is on a specific waterway or area, much of what's learned has broader implications.

"Our research findings get shared among other scientists and environmental managers, so it adds to our understanding of how watersheds and streams work so that we can better protect them," said Pavlowsky. "A lot of what we're finding out can be applied to other streams in the Ozarks."

BY ANDREA MOSTYN  
PHOTOS BY JESSE SCHEVE



Dr. Brooks Blevins stands outside the Jacob Wolf House in Norfolk, Arkansas, with the first book in his trilogy, "A History of the Ozarks."

# Ozarks history through a realistic lens





Frontiersmen, hillbillies, moonshiners and banjo players — these are a few stereotypes of Ozarkers.

But Dr. Brooks Blevins, the Noel Boyd professor of Ozarks studies, works to change these misconceptions through his research. He pores over countless materials about the Ozarks and conducts oral histories to provide a truer picture of the area and the people who live here.

A lifelong Ozarker, Blevins grew up on his family farm in rural Arkansas. He always loved history. When he got interested in the Ozarks as a college student, he chose to study both and devote himself to research.

“Since I lived here, this topic was much more personal to me,”

Blevins said. “I noticed there wasn’t much good history of this region. A lot of the writings were influenced by folklore and travel writers. They tended to be romantic and unrealistic.”

### WHAT IS THE OZARKS?

The physical Ozarks is roughly 40,000-45,000 square miles. It covers much of the southern half of Missouri and a large part of northern Arkansas. It also extends into northeast Oklahoma and southeast Kansas.



**In a packed auditorium, Dr. Brooks Blevins presents about Ozarks explorer Henry Schoolcraft in September 2018.**

While the physical Ozarks is well defined, its cultural boundaries are less so, Blevins notes. This is because people may live in the region but not identify as Ozarkers.

### THE FIRST IN A TRILOGY

Blevins has spent more than two decades discovering the Ozarks’ rich history. In that time, he has authored eight books, two of which are award winners.

“**THE OZARKS IS A MICROCOSM OF THE AMERICAN STORY. IT HAS ITS OWN UNIQUE FLAVORS.**”

His latest book — “A History of the Ozarks, Volume 1: The Old Ozarks” — came out in summer 2018. It’s the first volume in a trilogy that offers a comprehensive history of the region. No other book like this exists.

Volume one highlights the early days of the Ozarks before the Civil War. It chronicles the area’s formation and the lives of Native Americans. It also documents European colonialism and the mass migration of settlers.

Blevins writes about people as they hunted, fished, founded schools and churches, and developed communities. He tells colorful human stories within the context of what was going on in American history at the time.

Blevins says the most surprising discovery during his research was the central role “immigrant Indians” played in the old Ozarks. These displaced natives from east of the Mississippi River came from different tribes.

“For about two generations, thousands of them lived in the region. In the 1820s, they even

attempted to establish a sort of autonomous Indian nation in the Ozarks,” Blevins said.

Gary Kremer, executive director of The State Historical Society of Missouri, has read Blevins’ book. He says the breadth and depth of his research is outstanding.

“This book will enhance people’s understanding of the Ozarks because he brilliantly narrates the many ways in which the land and the people of the Ozarks interacted to shape each other,” Kremer added.

### A SNEAK PEEK

Blevins is working on volumes two and three of his trilogy. The target publication dates are fall 2019 and summer 2021, respectively.

Volume two will focus on the Civil War and Reconstruction era. Its main topics include slavery in the Ozarks, the secession crisis, the resulting war and the region’s reconstruction. It will also introduce the idea of the cultural Ozarks.

The third volume will pick up the story at the end of the 19th century and go into the 21st century. It will include a wide array of topics, from farming and industry to music and tourism.

“Underlying almost all the books’ subjects is an ongoing exploration of the perpetuation of cultural stereotypes and the role that the region’s image has played on its history and development,” Blevins said.

### RELATING TO THE MASSES

While Blevins is an academic, he tries to write history books that connect with common folks. He wants people in the Ozarks to know they have a valuable regional history of their own and take pride in it.

“It’s often a warts-and-all story like the American experience in general,” Blevins said. “But there are many interesting and iconic people and things that had their origins right here in the Ozarks.”

BY EMILY YEAP  
PHOTOS BY BOB LINDER

“

THE SETTLERS IN THE REGION  
CAME FROM BACK EAST AND HAD  
CONNECTIONS. THEY DIDN'T JUST CUT  
TIES AND DROP INTO THE WILDERNESS  
TO LIVE LIKE FRONTIER PEOPLE.

”





**Dr. Brooks Blevins enjoys the view from the Jacob Wolf House in Norfolk, Arkansas. The nearly 190-year-old structure served as the first permanent courthouse for IZARD County in Arkansas.**





Dr. Maciej Pszczolkowski develops natural insecticides and tests application strategies to deter agricultural pests.

# Traveling scientist: At home in the lab and field





It starts with a nibble. Then a leaf is tattered and lace-like. Soon your beautiful, bountiful garden looks like fire ravaged it.

Instead, it's the work of the Japanese beetle. But it's never just one. The beetles arrive in multitudes out of the earth. From white grubs chewing on the roots of your plants, they grow into a swarm that blankets your plants. They eat the tissue, damaging the plants beyond survival.

For farmers, the beetles' attack is an even greater concern. It's devastating to a crop, yet it's just one example of the pests that plague the agricultural industry.

#### TIPPING POINT

Dr. Maciej Pszczolkowski walks through the vineyard at the Mountain Grove campus. He points out leaf after leaf heavy with Japanese beetles. Staff spray the vines every five days, yet nothing is deterring them today.



**The Japanese beetle is one concern for Dr. Maciej Pszczolkowski. He is working to find the right amount of pesticide to use to deter pests with the least environmental impact.**

He also looks at improving pesticide formulations, application procedures and the careful timing of application.

#### THE PLANT AND THE PEST

Pszczolkowski approaches these issues in a variety of ways. He studies the pests — both their biology and their habits. As a brain physiologist, he tries to answer questions about why pests behave the way they do.

He also studies the pest-resistance of different plant varieties.

#### SUSTAINABLE FUTURE

Pszczolkowski has earned a reputation for understanding insects and manipulating their behavior. He serves as a reviewer for 18 journals in the field. He's also received more than a quarter of a million dollars in grant funding for projects since coming to Missouri State.

When he looks to the future, he hopes to influence the United States Department of Agriculture's recommendations on pest control.

A few years ago, he tempted codling moths, another common pest, to feed on the foliage of fruit instead of boring into it. Building off research he had conducted while working in Taiwan, at Washington State University and Kansas State University, he conducted many trials. Ultimately, he patented a chemical that drives away codling moth larvae from the fruit causing them to feed on foliage and die of natural reasons.

He also designs species specific traps and tests their effectiveness. For a farmer, Pszczolkowski points out, these traps or pesticides have to make economic sense.

"I want to give something to the grower: an insecticide, a method, something," he said. "Because there are times when one of these would benefit more than the others."

His work matters: For the overall economy to succeed and for the health of the population, he said, we depend upon farmers' success.

BY NICKI DONNELSON  
PHOTOS BY JESSE SCHEVE

**I TEND TO WORK WITH VERY SIMPLE MATERIALS, BUT I'M ASKING VERY IMPORTANT QUESTIONS.**

In the lab, his students look for alternatives to traditional synthetic pesticides. The team tests plant essential oils that could be used as natural insecticides to target specific insects.

Synthetic pesticides damage human health, water quality and wildlife. They also kill natural pollinators,

according to Pszczolkowski's graduate student, Michael Fenske.

"Synthetic pesticides, while effective, will eventually cause many serious problems that will not be reversible," Fenske said.

Pszczolkowski, who has published more than 60 peer-reviewed articles in his career, loves the balance in his work. He enjoys working in the lab with his students to identify natural solutions to these agricultural problems.

But nothing compares to the outdoors, he says.

It's a double-edged sword, according to Pszczolkowski, agriculture professor hailing from Poland. Pesticides are necessary, but they should be limited.

"The question is how to mitigate pesticides' detrimental impact on the environment and humans," he said.

Much of his research now focuses on determining that tipping point. What is the least amount of pesticide that allows for minimal damage to the environment but still provides the necessary amount of pest control?

A close-up photograph of a hand holding a small, light-colored insect, likely a pest, against a background of a lush green vineyard. The hand is positioned in the center-right of the frame, with the fingers curled around the insect. The vineyard rows stretch into the distance under a clear sky.

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**MACIEJ'S WORK CAN HELP PEOPLE  
USE PESTICIDES MORE EFFECTIVELY,  
REDUCE WASTE AND PROTECT THE  
ENVIRONMENT WHILE MEETING PEST  
MANAGEMENT NEEDS.**

**– DR. DEIRDRE PRISCHMANN-VOLDSETH  
NORTH DAKOTA STATE UNIVERSITY**

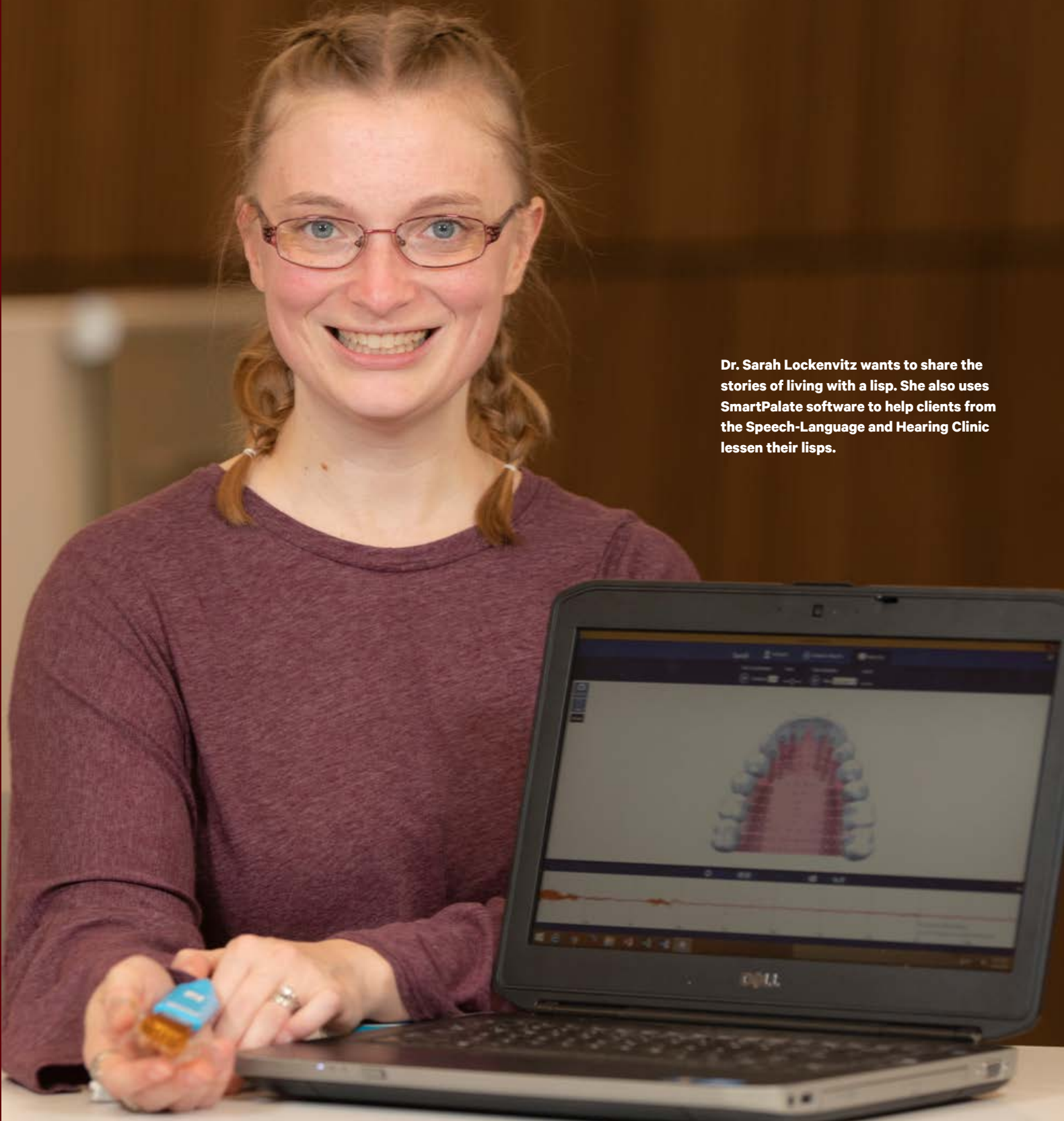
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**Dr. Maciej Pszczolkowski examines grapevines at Missouri State's Mountain Grove campus. He inspects the leaves for signs of Japanese beetles and other agricultural pests.**







Dr. Sarah Lockenvitz wants to share the stories of living with a lisp. She also uses SmartPalate software to help clients from the Speech-Language and Hearing Clinic lessen their lisps.

# Living with a lisp

DR. SARAH LOCKENVITZ





**Graduate student Lindsey Lower (left) tests the SmartPalate equipment with graduate student Allie Savich (right) as Dr. Sarah Lockenvitz evaluates the results.**



"No one says, 'I love having a lisp,'" Dr. Sarah Lockenvitz said.

A lisp is common in preschoolers and often recurs when a child loses teeth. In some cases, speech therapy can treat a lisp, but not always.

As an assistant professor of speech-language pathology, Lockenvitz studies the life experiences of those with a persistent lisp.

"Something as minor as a childhood scar, acne or body odor can affect your self-confidence. A lisp can, too," she said.

She began her career studying how to transcribe and articulate certain sounds. It was a very black and white, quantitative research project.

But reading a personal account of one author with a lisp led her to explore the softer side of research.

"I'm interested in storytelling," she said, "and the reflections of a life with a lisp."

Lockenvitz began recruiting subjects to interview. Quickly, she found that identifying subjects to participate was a major hurdle.

As she advertised online, many initially responded that "they knew someone who would be perfect for the study," she said. After more careful consideration, many bowed out. They reported that they couldn't broach the subject with their friend or family member. It was too sensitive of a subject.

**COPING MECHANISMS**

Eventually Lockenvitz gathered a large enough sample size to proceed. Once she began collecting surveys and interviewing subjects, several themes appeared.

Some were predictable: feeling different and lacking confidence in social encounters. But other themes that surfaced surprised her. Avoidance appeared as a common coping mechanism for those in her study.

A person with a lisp might avoid words with prominent "s" or "z" sounds. This avoidance interrupts the flow of conversation to reword a response. It not only slows conversation, but it adds to the feelings of isolation and being different.

"I had a participant who talked about only memorizing vocabulary words in his SAT preparation book that did not have s's in them," Lockenvitz said. "It blew me away."

Avoidance had become ingrained in his life. He automatically skipped over the difficult words — even in a scenario that wouldn't require him to say them.

**“ STUTTERING AND LISPING AFFECT SPEECH PATTERNS DIFFERENTLY, BUT THEY BOTH HAVE IMMENSE REPERCUSSIONS ON COMMUNICATION. ”**

**SOCIAL SENSITIVITY**

Lockenvitz also analyzed the responses and identified a lack of social sensitivity toward lispings. Previous studies on stuttering showed that people recognized it was socially unacceptable to tease someone for this speech disorder. Those with a lisp still felt victimized.

"Making fun of speech problems is apparently acceptable in our current state of society," Lockenvitz said. "It's sad."

One speech-language pathologist who participated in the study had a lisp herself.

In addition to difficulty with the sounds, she had a visual lisp. Her tongue thrust forward, protruding between her teeth.

She shared how her colleagues talked about her lisp behind her back. They put her on the spot, at times making her feel shame. But the worst critic was her daughter, the up-and-coming comedian.

"It was part of her bit," Lockenvitz said, "the speech pathologist with a lisp. It was really hurtful to her mother."

**TESTING TECHNOLOGY**

Lockenvitz is collaborating with Dr. Alana Kozlowski, associate professor of communication sciences and disorders, on a project to retrain lispings tongues using biofeedback.

Graduate students in the Speech-Language and Hearing Clinic take molds of the mouths of adults who have persistent lisps to design palates. A palate, with sensors inlaid throughout, can be placed in the roof of the mouth. Once connected with the software, it can show the contact points between the tongue and palate.

"The clients have a visual to show them where the tongue should be to make the sound correctly," Lockenvitz said.

While the technology has been used in the field for many years, Lockenvitz and Kozlowski are using it in an innovative way. They are applying the principles of motor learning along with this technology. This means clinicians adjust the type and amount of feedback they offer to clients as they produce sounds.

With this method, Lockenvitz is hopeful that clients will work toward independence and consistent accuracy while restoring confidence.

BY NICKI DONNELSON  
PHOTOS BY JESSE SCHEVE



Although Dr. Todd Payne dreams of performing at the Metropolitan Opera, he knows he is already fulfilling his purpose: touching the lives of others with his music.

# Singing between the lines





Dr. Todd Payne has the voicemail saved on his office phone. It illustrates his research focus: How can we help audiences identify with us through performance?

The message came from an 87-year-old woman in Missouri. Days earlier, Payne, a professor of music and professional opera singer, performed with the Springfield Symphony for a special Black History Month concert in February 2018.

Payne delivered soaring solos and narrated Dr. Martin Luther King Jr.'s iconic "I Have a Dream" speech.

"You gave me my soul back with your songs and your wonderful voice and the things you said today," she said. "You gave me my life back.

"I have to tell you that I'm losing my eyesight to degeneration, but I once was blind, but now I see. Thank you. Bless you."

Payne turns off the recording. He sits back in his chair as a state of contentment washes over his face.

"It made me realize that I am exactly where I am supposed to be, doing what I am supposed to be doing," he said, tapping his index finger on his desk with each beat.



**Dr. Todd Payne works with student Alex Smith.**

"If I never get to the Metropolitan Opera, it's OK, because I know I was put on this Earth to touch the lives of others through the power of music."

### A LIFETIME PERFORMER

Payne estimates that his career includes hundreds of performances. The list includes more than 30 recitals and major performances in the last five years.



**WHEN YOU FIND THE MEANING OF MUSIC, I BELIEVE YOU GIVE AN AUDIENCE MORE THAN JUST A BEAUTIFUL VOICE OR ENTERTAINMENT. YOU'RE BEING VULNERABLE TO SHARE PART OF WHO YOU ARE WITH THEM THROUGH YOUR SINGING.**



He teaches choir, guitar and music theory at Festus High School in Festus, Missouri. Payne inspired him to never give up on his students.

"He really helped me on my sense of drive with my voice and finding my true voice," Boemler said.

He also teaches voice at Missouri State, in courses that range from the 100 to 600 levels.

Payne shared that voicemail with his students to drive home a central point: He's here to teach them so much more than singing.

"My research is going underneath the surface," he said. "I look at music and ask, 'What is it saying? How does it apply to me, and how can I give that back to the audience?'"

When he walks out on stage, the audience sees or hears him as Dr. Todd Payne. But Payne himself said he experiences an out-of-body sensation.

"Every time when I walk on that stage, I leave Todd Payne in the wing outside and I walk on as whoever I am beginning to personify," he said.

He makes that happen through relentless preparation.

"I practice and perform as if I'm getting ready to make my debut at the Metropolitan Opera.

I teach my students as if they, tomorrow, are getting ready to change the world."

One of Payne's former students, Chris Boemler, echoed that statement. Boemler spent parts of nine semesters under Payne's wing, and graduated with a bachelor's degree in music education in 2012.

### TEACHING INCLUSION

About two years ago, Springfield Symphony music director Kyle Wiley Pickett approached Payne with an idea.

The director wanted to do something special for Black History Month in February 2018. Payne said he'd love to put together a group of selections.

"It was magical. That was the first time that, to my knowledge, the symphony had ever performed 'Precious Lord, Take My Hand' and 'We Shall Overcome' with narration of Dr. King's words," Payne said.

Payne said he's a storyteller, and that he tells his students that their job is to touch the lives of those who are in the audience.

"Music sees no color. It sees people for who we are. We're stronger together as one."

BY KEVIN AGEE  
PHOTOS BY BOB LINDER



Dr. Doug Gouzie calls Missouri, the Cave State, home. It provides ample opportunities for research. He studies sinkholes and is working to develop a better way to predict future sinkhole sites.

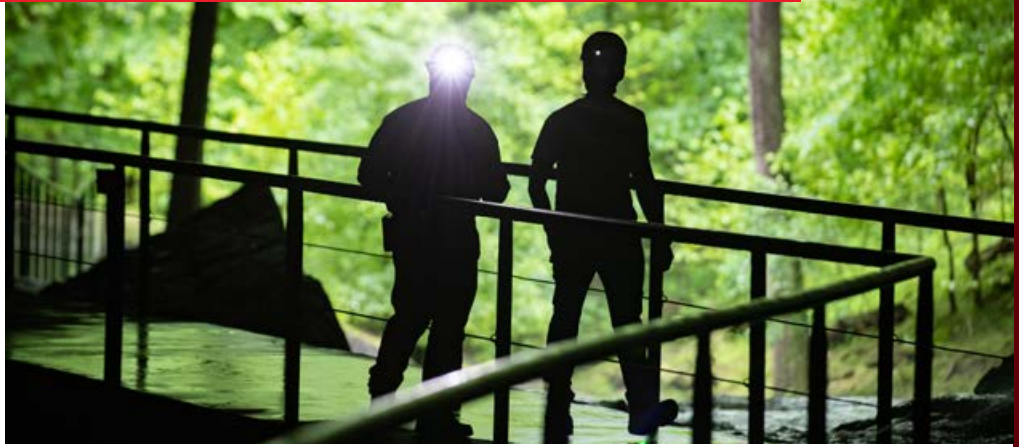
# Sinking suspicion: Predicting future disasters

DR. DOUG GOUZIE





**For sinkholes to form, foundation and soil washes away into deep caverns over time. Dr. Doug Gouzie and graduate student Jordan Vega stroll through Smallin Civil War Cave in Ozark, Missouri.**



If you lived on top of a sinkhole, would you want to know?

“When a house falls into a sinkhole, neighbors clamor for information. They ask if their house is next,” said Dr. Doug Gouzie. “It’s unimaginable and devastating, but I don’t think they really want the answer to that question.”

Gouzie, a geology professor, studies land formations, like sinkholes, and how water forms them.

“Your house being built on a plot of land doesn’t create a sinkhole. It’s not the weight of a structure,” he said. “The right conditions must already exist underneath the ground.”

He’s one of about 100 doctoral-level people in the country studying these structures.

His goal: predict the next sinkhole.

**COMMON THEMES**

By investigating sinkholes, Gouzie finds similarities. Each finding moves him toward that major end goal — one he’s not sure will be reached in his lifetime.

His studies have revealed a variety of contributing factors. In one residential neighborhood where a sinkhole swallowed a house, he found a correlation between sinkholes and mature trees.

“Mature trees are very, very good at finding water,” Gouzie said.

Roots often spread out to gather water. If roots fight their way through cracks in the underground rocks to find a reliable source, there might be a problem.

“If a crack leads to a cave passage with a stream, that makes trees happy,” he said.

In this particular case, the owner had cut down a tree, but the stump remained. Gouzie said it’s unclear whether grinding out the stump, yanking it out or leaving it would have lowered the risk of a sinkhole.

Because the tree was now dormant, the roots shriveled up, leaving significant cracks in the rock. Anything like this, which funnels water underground, can make the ground vulnerable to caving in.

**HOW IT WORKS**

About 20% of the United States is built upon limestone or other carbonate rocks, which are called karst lands. When rain falls, the acidity in the rain slowly dissolves that rock.

may be amiss. The lighter area may indicate the water has dissolved lime. Instead, the water is moving somewhere deeper.

“If I know where the landscape is draining into — where it’s going underground,” he said, “then I know where it’s washing the soil away. That’s where I’m going to find the next sinkhole.”

**DYE TRACING**

Along with his graduate students, Gouzie spends many hours in caves across Missouri and on stream banks collecting water and sediment.

“Nature gives us the results that will help us predict what sinkholes or drainage areas are connected with which cave or spring underground,” he said.

One way they determine this is by placing dye in the streams — detectable by black light but not the human eye. Using an instrument with a very sensitive electric eye, the team can trace the dye’s path, even when the spring meanders underground.

Director of the Missouri Geological Survey Joe Gillman appreciates how Gouzie’s work also seeps into other areas, such as water quality and public health.

“He’s addressing real geoscience challenges affecting people’s daily lives,” Gillman said. “His research routinely focuses on finding solutions for not only his community, but also the citizens of Missouri.”

**BY NICKI DONNELSON  
PHOTOS BY KEVIN WHITE**



**IF YOU HAVE A NEW SINKHOLE, PEOPLE ALWAYS WANT TO KNOW WHERE DID ALL THE DIRT UNDERNEATH GO?**



Gouzie likens it to a marshmallow in a glass of water. First the marshmallow gets goopier, then becomes marshmallow fluff and finally dissolves.

When rain water hits the soil, the small soil particles can wash out through the dissolved holes quickly, he noted.

The appearance of the soil in your yard can tell a story, too. If you see areas with lighter soil while other areas stay a richer brown, something

Dr. Doug Gouzie and his graduate students place dyes like these in local streams. Using an instrument with a very sensitive electric eye, they are able to trace the dye's path into caves.







“

**ONCE WATER FINDS A PATH, IT WILL KEEP SEEPING THROUGH. YOU'RE NOT GOING TO CREATE FANTASTIC CAVERNS IN 50 YEARS, BUT YOU CAN IN A COUPLE OF MILLION YEARS.**

”



Dr. Jake Simmons looks at the intersection of communication, environment and culture. He also is interested in communication perspectives in the posthumanities.

# Making space for everyone



**Dr. Jake Simmons listens to student discussion during his autoethnography class.**



It is easy to forget that everyone has a different life experience.

What happens when cultures collide on college campuses? How are different life experiences blended or rejected? How can universities accommodate and appreciate everyone?

These questions drive Dr. Jake Simmons' work. He researches the experiences of students of color on college campuses. His goal is to improve diversity and inclusion programs.

"It's important to create safe spaces to share experiences," Simmons said. "It's important to students and to the fabric of a university."

As the graduate studies director in the communication department, he uses his research to step into the shoes of others.

**IT BEGAN IN 2013**

Simmons studied Black students' experiences in predominantly white institutions (PWI). He researched through a relational dialectics lens.

Relational dialectics, to put it simply, is studying the competing tensions involved when we speak about an issue.

"We are always speaking twice," Simmons said. It's not just what you say, it's how you say it.

He and his collaborators conducted individual interviews and focus groups. In total, 67 African American students answered questions about their lives at PWI.

The students felt conflicted. They wanted to participate in their own culture. To gain acceptance, though, the students felt they had to take part in dominant traditions.

The study received national attention in prominent news outlets, like Inside Higher Education and The Huffington Post.

"It was surprising that it became national news," Simmons said. To him, it seemed obvious.

**WHAT'S WRONG?**

According to Simmons, institutions make one primary mistake when they develop diversity and inclusion programs. In too many cases, student experiences are not considered.

"Students of color need to be offered the opportunity to tell their institutions what they need. Administration needs to give them the space to do so," he said. "This might not sound novel, but it's very rare that it ever actually happens."

If these programs are woven into the fabric of universities, Simmons believes institutions will retain more students. This is especially true with international students.

"You constantly have to ask the people you are serving what they need and figure out better ways to give that to them," Simmons said.

**BRINGING INCLUSION HOME**

At Missouri State, Simmons advises more than 60 graduate students and brings new information into the classroom.

He collaborates with Dr. Shawn Wahl, dean of the College of Arts and Letters. Together, they wrote a new textbook for the intercultural communication curriculum. They aim to improve students' cultural competence at MSU and beyond.

"Our work together, on both journal articles as well as a book focused on intercultural communication, has made me a better person," Wahl said. "It is an ideal situation to work with highly competent people who also exemplify kindness, humility and professionalism. Jake does all of it."

**IT'S PERSONAL**

Simmons' four children are multicultural and multiethnic. This turns his work into a passion project out of love and protection for his kids.

"I want to create a better future for them," he said.

**“ DIVERSITY AND INCLUSION PROGRAMS CAN BE MOST EFFECTIVE WHEN THEY ARE CONSTRUCTED THROUGH A RELATIONAL PARTNERSHIP. ”**

For everyone else, Simmons sees a future where we are more understanding and more accepting of each other.

That world starts with you.

"Trust yourself, your voice and your cultural voice," Simmons said. "It matters to change institutions and the classroom. It matters in the world."

**BY LAUREN STOCKAM  
PHOTOS BY JESSE SCHEVE**

Dr. Anita Liu's research will improve how smartphones work even when wireless access is limited.



# Getting your message across when systems fail



When disaster strikes, smartphones show their power.

Although traditional communication systems may falter, data can still transfer from phone to phone until it reaches an area with service. This is called a wireless ad-hoc network — one of Dr. Hui “Anita” Liu’s research interests.

According to Liu, devices must cooperate to form this network. Each phone shoulders a slice of the burden. Together, they have the strength and functionality to relay and process data.

However, Liu’s latest research projects assume that some will act as altruistic punishers rather than rational humans.

“Humans have a predisposition to punish those who violate group-beneficial norms,” Liu said. “This is true even when it comes at a cost to the punisher.”

This is altruistic punishment.

Her research team designed an experiment based on this assumption. They wanted to see the effect on cooperation.

“

**I THINK MY WORK IS IMPORTANT TO YOU BECAUSE I CAN PROVIDE BETTER USER EXPERIENCE IN THE FUTURE USING YOUR SMARTPHONE.**

”

To do this, she simulated a group of devices. Ten percent would act cooperatively. The other 90% were programmed as noncooperative.

Some of the cooperative devices converted to altruistic punishers. Many of the noncooperative devices were

eliminated. This allowed the new network to perform.

### BETTER TOGETHER

While humans might elect to cooperate in this manner — to work for the greater good — does a wireless system?

“Every device needs to contribute by spending its energy,” said Liu, computer science professor.

She’s published and presented more than 20 times internationally on the topic of networks without central infrastructure.

To study this, she and her collaborators model networks and use computation to mimic the real peer to peer network. Then they monitor how the devices work and learn.

“As you improve cooperation level, you improve the performance of the whole system,” she said.

Peer to peer networking is a burgeoning field, changing all the time. In previous research of these systems, researchers assumed devices would act as rational humans.

“There’s this assumption that the devices would be selfish — maximizing individual benefits,” she said.

### PIONEER IN THE FIELD

All of her research projects come down to this: How can smartphone user experiences improve?

Deng Li, a colleague from Central South University in China, has collaborated with Liu on many projects. Li noted that Liu is intelligent and diligent. With these qualities combined, Li believes Liu’s work will continue to influence this field.

“In her research, she creatively applies theories and statistics to solve computer science problems,” said Li.

As technology capabilities change, Liu feels confident developers will focus on networking in a decentralized environment. And she is excited to be part of this evolving field.

Because if you’re on the battlefield or trapped inside a flooding house, the service could save your life.

BY NICKI DONNELSON  
PHOTO BY BOB LINDER



When traditional communication systems fail, data can still transfer from phone to phone until it reaches an area with service. This is called a wireless ad-hoc network.



Dr. David Gutzke (pictured at Lost Signal Brewing Company) says many of the changes in British public houses, or pubs, during the early 20th century can be related to the Progressive movement.

# Blending history, pubs and politics

DR. DAVID GUTZKE



**The proprietors of *The Man of the World* drew this large group of women to the pub in October 1928. Submitted by Dr. David Gutzke**

The smell hits you before you walk through the door. Drop by your favorite local bar and you expect the smell of deep-fried fare. That's the reality today.

But in the 19th and early 20th centuries, public houses (nicknamed pubs) didn't offer food.

You may think it changed in order to turn greater profits. Instead, Dr. David Gutzke argues that pubs evolved in Great Britain as a ripple from the Progressive movement.

He believes his greatest scholarly contribution is that he established the Progressive movement as a transcontinental movement. Previously, it was considered as American as apple pie.

Gutzke, a distinguished professor of history at Missouri State University, set the stage in his book, *"Pubs and Progressives."* He focused on the period between World War I and World War II. Historically, it is known as the interwar period.

As a professor of British history, an international scholar on the topic of alcohol use and a historian looking at social change, he has published more than 20 books and articles on these subjects. *"Pubs and Progressives"* nicely knits these interests together.

### **DRAWING THE CROWD**

"The brewers were trying to change the type of people you expected to see in pubs. They wanted middle-class people as customers. Brewers wanted respectability," he says, "both for themselves and public houses."

This aligned with the Progressive movement's values. Progressives wanted to right social ills. They desired efficiency, discipline and order. And they sought government intervention to improve society.

One brewer Gutzke studied, Sydney Neville, wrote in his memoir he felt personally responsible to the general public to discourage drunkenness.

"The slogan of the whole movement was, 'We do not want people to drink more beer. We want



**THE SUCCESSFUL OUTING ARRANGED BY THE PROPRIETORS OF "THE MAN OF THE WORLD."**

more people to drink beer.' I thought it was very clever," Gutzke said.

One way to attract a different clientele: Brewers spent tens of thousands of pounds beautifying spaces, adding courtyards, gardens, linen tablecloths and fresh flowers.

"Before the first World War, the pub was a masculine republic," Gutzke said. "Progressive brewers believed women could act as a restraint on drunkenness."

### **MONEY HUNGRY?**

Then brewers expanded into offering a full menu. Food made the pub seem like a respectable place to spend time and eat dinner as a family.

Large Progressive brewers, like Neville, recognized building new, expensive pubs would likely eliminate smaller, "less scrupulous competitors," who tolerated drunkenness to maximize profit.

Gutzke notes that this statement alone reveals a desire for social change.

"Neville writes in the preface of his book, 'I just hope that people come to understand what we were doing after I'm dead,'" Gutzke said.

### **FINDING THE EVIDENCE**

Digging into publications from political scientists, anthropologists and sociologists, Gutzke drew a more robust world picture. This

comparative history helped him identify the Progressive movement in Britain.

Gutzke also gathered photos, ledgers and legal documents to see the buildings before and after renovations, as well as changes in sales over time. For *"Pubs and Progressives,"* he gathered data from about 6,000 pubs.

"He is a master researcher who ferreted out all sorts of records that are difficult to locate," said Dr. William Rorabaugh of University of Washington. "He interviewed a significant number of leaders in the alcohol industry — an industry which is perhaps understandably ordinarily very tight-lipped."

“

**HISTORIANS HAVE TO BE MINDFUL: YOU MUST NOT ALLOW PRESENT-MINDED CONCERNS TO BE PROJECTED INTO THE PAST.**

”

The general public, he says, thinks historians write history books to get everything factually correct for future generations.

"The truth is an abstract concept," Gutzke added. "Historians engage in how to understand the past."

**BY NICKI DONNELSON  
PHOTO BY KEVIN WHITE**





**Dr. Stanley Leasure, seated in the library of Missouri's Court of Appeals, primarily studies cases and rulings to deduce how courts interpret the Federal Arbitration Act.**



# Influencing the future of arbitration

A ball of emotions. That's what happens when you get a new job. Excitement. Anxiety. Fear. Elation. Confusion. Confidence.

Dr. Stanley Leasure's work may give you one more thing to consider when you sign an employment contract or read the employee handbook. What happens when something goes wrong?

"Many big companies want to limit your ability to sue them — of course they do," Leasure said. "It's messy and expensive. But more than that, it's an exhibition that they don't want."

Leasure, a business law professor, was a partner in an

Arkansas law firm for more than 25 years before joining the Missouri State University faculty. His interest in alternative dispute resolution — like arbitration, negotiation and mediation — began there.

Now he studies cases and rulings to deduce how the courts interpret the Federal Arbitration Act. He publishes articles on the precedents set forth and the discrepancies he sees. His work has influenced several court decisions. It has even been cited by attorneys appearing in the U.S. Supreme Court.

## ARBITRATORS DECIDE YOUR FUTURE

Every day, more companies are establishing policies that state litigation is not an option in

case a dispute arises. Instead, companies prefer — and are requiring the use of — arbitration.

An arbitrator's decision is considered final, legal and binding. Leasure is trying to influence how and when attorneys should be able to appeal the decisions.

**LEGAL SCHOLARS HAVE A UNIQUE ABILITY TO AFFECT THE DEVELOPMENT OF THE LAW.**

"Who gets to decide? When are parties bound by an arbitration agreement? What issues are covered by the agreement? These are some of the questions I'm asking," he said.

## PANDORA'S BOX

When the Federal Arbitration Act passed in 1925, it contained a few circumstances when an arbitrator's decision could be overturned in court. Since then, more and more people dissatisfied with an arbitrator's decision appeal to federal court.

"This is where Pandora's box is really flung open," Leasure said.

Courts interpret the nuances of those original exceptions differently. Several have expanded

the exceptions beyond those in the Federal Arbitration Act.

While the courts have moved to revert to the original exceptions, some of the newer exceptions are still in play. Until all of the additions have been removed, Leasure expects more cases to make their way through the appeals process.

## FINDING INSPIRATION

Besides reading the latest literature, Leasure scours Twitter for hot topics.

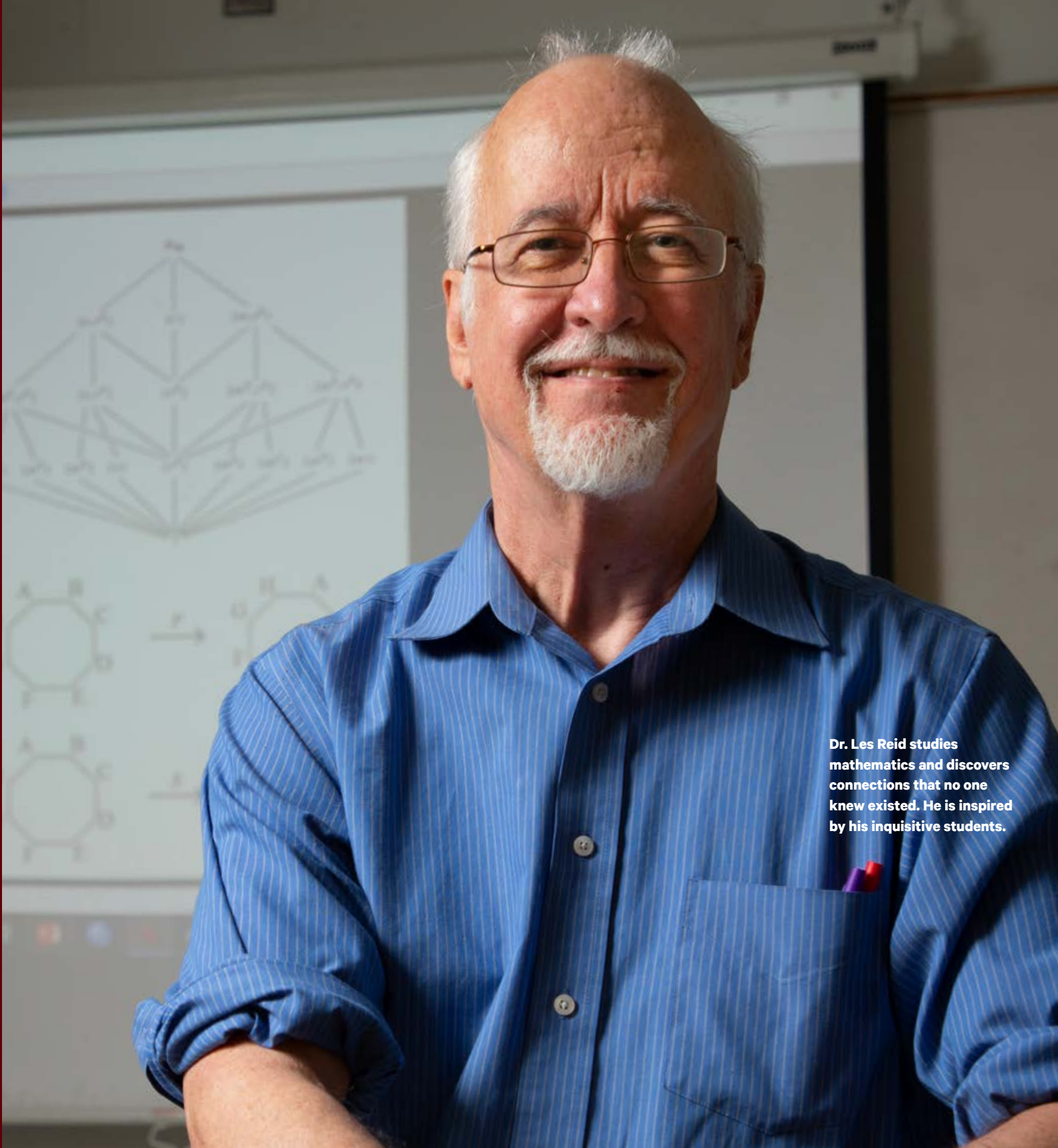
Sometimes he approaches his high-achieving students about collaborating on a research project. It's a virtual collaboration since he primarily teaches online courses. But students like Ariel Kiefer considered it a great experience.

"Dr. Leasure helped me explore a topic and let me have a substantial part in researching and framing the article," said Kiefer, a 2015 MSU graduate. "The skills I learned with his guidance were a great help in law school."

Leasure agrees. Collaborating with his students can accelerate research projects. Ultimately, that means he's influencing the interpretation of the law in two ways at once.

"I'm getting my viewpoint in front of attorneys and judges in these articles, and they are citing our articles in their decisions," he said. "I'm also coloring the way my students see these dispute resolutions. And they are taking that into their future careers — law or otherwise."

BY NICKI DONNELSON  
PHOTO BY KEVIN WHITE



Dr. Les Reid studies mathematics and discovers connections that no one knew existed. He is inspired by his inquisitive students.

# Looking for connections



Our lives are full of connections.

You see someone you know in the grocery store two aisles over. What's the quickest way to get to them?

Your parents live 2,000 miles away. There are no direct flights. Which flight has fewer layovers?

Connections are rarely as easy as point A to point B. There are stops along the way, twists, turns and sometimes you may even get lost.

Dr. Les Reid, professor of mathematics, studies similar connections.

### FINDING THAT CONNECTION

"People don't realize that there are questions in math that we can't answer yet," Reid said.

"Geometry is 2,000 years old. Calculus is 400 years old. You might think there's nothing new under the sun. But there's a lot that we still don't understand."

For more than 10 years, Reid has looked at how to start one place and end up another.

Take a triangle. It has three points: A, B, C. Turn it in whatever direction. It still has those points; they are just in different places now.

Then, instead of turning it, flip it like a pancake. The points are still there, they have just changed again.

How do you get back to the original location? How have these points changed?

Reid looks at all of these data and maps them on a graph. He uses algebra and geometry to find his results.

"Dr. Reid is one of the most brilliant mathematicians in our department," said

Dr. Richard Belshoff, professor of mathematics at Missouri State. "He has an incredible breadth and depth of knowledge of virtually all areas of mathematics."

### A MATH TEXTBOOK

It all started with a question by one of Reid's students, Joseph Bohannon.

He saw a figure in a textbook that intrigued him. He and Reid set off to find an answer.

“

**MY MAIN CONCERN IS TO STUDY. THERE ARE A FEW UNIVERSITIES THAT HAVE MATH IN THE HUMANITIES COLLEGE BECAUSE WE'RE MORE INTERESTED IN THIS ABSTRACT SYSTEM OF MATHEMATICS.**

”

Reid said he was surprised by what they found. He figured that he and Bohannon would get partial results.

It's hard to get actual, full results in math. Instead, they ended up classifying a whole group of shapes.

"What was surprising was that a complete classification was achieved," said Bohannon. "I expected that there might be stragglers all over the place."

### LOOKING FORWARD

A lot of the time, mathematicians are leaving a legacy rather than practical solutions. Reid doesn't know how his research will be utilized in the next 100 years.

Reid uses nineteenth century Indian mathematician Srinivasa Ramanujan as an

example. Ramanujan loved that his mathematics were pure, with no immediate application.

"One hundred years later, some of the stuff that Ramanujan was doing is the basis for business on the Internet," Reid said. "He thought his work was so pristine and beautifully abstract. Anything to do with the real world is messy and ugly."

Though Reid doesn't know what will come of his work, he does know why he does it.

"Most mathematicians study mathematics for the inherent beauty of it," Reid said.

Reid's studies have led to more than 25 published publications in prestigious journals with 10 in progress. He has also collaborated with many prominent mathematicians throughout the world.

"We may not know what the future applications might be, but gaining a deeper understanding of the fundamental principles of mathematics is essential."

### CREATING THE NEXT GENERATION

Reid also works with Research Experience for Undergraduates (REU). This National Science Foundation funded project allows top notch math students to come to Missouri State for the summer to work on mathematical problems.

Bohannon's problem led to three summers' worth of REU projects. Some students looked at graphs. Some looked at groups of shapes. They intertwine algebra and geometry looking for connections.

Though Reid calls his work the most basic of research, it has endless possibilities.

BY TORI YORK  
PHOTO BY BOB LINDER

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