

Psychological Sciences Communique

Spring 2013

SEC Entry Highlights Sports-related Research

By Steve Hackley

Mizzou's transition from the Big 12 to the Southeastern Conference is an opportunity to highlight sports-related research in our department. The connection between psychology and sports is a natural one, as illustrated by Yogi Berra's observation that "Baseball is 90 percent mental; the other half is physical."

In his engaging and readable book, *The Psychology of Baseball*, Associate Professor Mike Stadler argues that psychological science lends itself to an appreciation of competitive sports that is richer than that offered by folk psychology and common sense. Stadler shows how phenomena from experimental psychology such as cognitive biases and unconscious priming can help us to understand athletic performance at a deeper level. Statistical techniques borrowed from the behavioral sciences are helping team managers to improve recruitment, as portrayed in the film *Moneyball*, starring MU alumnus Brad Pitt. Concepts from psychometric-based psychology also provide insights, for example, specification of motivational processes and personality traits

that predict success on the playing field.

Personality characteristics such as conscientiousness and resilience help athletes to stick to a demanding regime of practice, according to Stadler, which allows new skills to be embedded in implicit memory. A psychologist at Florida State University, Anders Ericsson,

estimated that 10,000 hours of deliberate practice are required to achieve world-class expertise in domains such as music, chess, or sports. Although critics have challenged Ericsson's dismissal of genetic factors, no one would deny that excellence in competitive sports requires phenomenal amounts of practice.

Stadler points out that one of the ways athletes motivate themselves is to find the fun in practice, to create ways to make tedious repetition seem interesting and enjoyable. Assistant Professor Nicole Campione-Barr, who had

been a competitive figure skater before turning to a career in science, definitely agrees. "I think part of why I was willing to practice a thing over and over—say learning a new jump—was because the thrill of getting it correct was such a high that it would motivate me to keep going. Additionally, though, just because you get it once doesn't mean

you would get it again right away. The reinforcement schedule was pretty random, so I kept trying, hoping this was the time I would get it again."

Campione-Barr uses the words "thrill" and "high." As the reward

system employs the neurotransmitter dopamine to wire a new habit into the brain, pleasure is involved. Sports psychologist Hiroaki Masaki examined this topic during a sabbatical stay at my movement disorders laboratory. At his own lab in Waseda University in Tokyo, Masaki's recent graduate students have included two Olympic skaters and a tennis player who competed at Wimbledon. Masaki used EEG and functional MRI to determine if the rewarding properties of "getting it right" depend on knowing that the success

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Senior Haley Krentz at a soccer match in 2012.

Senior Bethany Pfeiffer at a track and field meet in 2012.



By Moshe Naveh-Benjamin

From the Chair

Our department is doing very well despite challenging times at the university. Faculty members continue to excel, and this year several of them have received honors for their outstanding research and teaching. Amanda Rose received a Chancellor's Award for Outstanding Research and Creative Activity for 2012, Alan Strathman received a Graduate Studies Outstanding Departmental Contribution Award for 2012, Ines Segert received a William T. Kemper Fellowship for Teaching Excellence for 2012, and Etti Naveh-Benjamin received a Faculty-Alumni Award for 2012. In addition, several of our researchers were awarded multi-year grant support by NSF and NIH. Finally, under the leadership of Ken Sher, our NIH-funded training grant in addition, which provides support for graduate students and postdoctoral researchers, was renewed for five additional years.

We've also had a new faculty member join us this year. Laura Scherer, coming from the University of Michigan, joined our social psychology/personality training area. Laura's research interests lie in when, how, and to what advantage people use spontaneous associations and "gut feelings" when

making decisions. See Page 5 for more information about Laura's research.

We, likewise, continue to do well in our mission of educating our undergraduate and graduate students. We now have about 1300 majors and are working hard to engage both the interests of those students who are taking psychology courses as part of their general social sciences requirements and those who are interested in pursuing careers in psychology and related areas. To provide more thorough preparation for the latter group, our department is planning a more rigorous, science-intensive degree program that will make psychology students both more attractive candidates for postgraduate admission and more likely to succeed once they begin. To achieve this, the department has submitted requests to allow for the creation of a new bachelor of science degree and a master's degree in applied psychometrics. See Page 5 for more on these programs.

Coinciding with the transition of Mizzou to the Southeastern Conference, this issue highlights research conducted in our department that has relevance for sports. The front-page article describes our department's

psychological and neuro-imaging projects on reward-based learning, skill acquisition, and tool use. These studies explore these skills' impact on both peak performance in the playing field and on rehabilitation techniques, for example, for stroke patients. In this context, we spotlight several of our stellar undergraduate students who are also accomplished athletes (see Page 3).

Our numerous alumni, both undergraduate and graduate, are a source of pride for the department. We hope to continue to have your support for our missions, and considering the fact that resources are tight at the university, our department benefits tremendously from alumni contributions to our research, teaching, and community involvement.

Finally, our sixth Psychology Day on April 26, will see both graduate and honors undergraduate students present their research from the current academic year. That same day, we will also be sponsoring an award ceremony to note the accomplishments of our students, joined by our alumni board members. Our guest speaker will be Michael C. Roberts, an undergraduate alumnus of the department, (read his bio on Page 6). We invite all of you to join us for the event.

I thank all of you—faculty, students, our dedicated staff, as well as our alumni everywhere—for your part in our lasting success.

Sports-related Research

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wasn't due to mere chance, but rather, that you succeeded because you did what you intended to do.

Athletes are keenly sensitive to this distinction. Stadler's book recounts an anecdote from Tony Gwynn of the San Diego Padres. Gwynn told sports/political writer George Will that "the previous night he had hit two balls hard. One pleased him, the other distressed him. The pleasing one was an out, the distressing one was a home run." Gwynn's account implied that kinesthetic and visual feedback rewarded him with hav-

ing made a good swing in the former case, even though it resulted in an out. The home run, however, was the result of a poorly executed swing that, mainly by chance, had turned out well.

Masaki contrasted two conditions in a button-pressing task. In one condition, the participants correctly understood that the monetary rewards and penalties they received were due entirely to chance. In the other condition, subjects were led to believe that these outcomes were determined by their voluntary choices. In fact, though, the

wins and losses were always delivered randomly. Using scalp EEG recordings, Masaki examined a dopamine-dependent brain wave that occurs on each trial just before feedback is received. He found that this electrical sign of reward anticipation was twice as large during trial blocks in which participants believed that their voluntary choice determined the monetary outcome.

The follow-up fMRI study showed that a likely source of the EEG effect

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Undergraduate Student Athletes By Kristy van Marle

Bethany Pfeiffer—senior (track & field), 3.70 GPA, double major in psychology and math, honors student. NCAA Championships qualifier in 2011, 2012. Academic All-Big 12 and All-academic Women's Track & Field Team in 2012.

Pfeiffer has put her psychology studies to use by helping others and herself overcome competition anxiety and work through stressful training. She plans to obtain a master's degree in higher education administration at Southeast Missouri State University. This degree would allow her to start out teaching high school math and eventually transition into an administration position at a community college. Pfeiffer believes that studying psychology will help her achieve her future goals because it allows her to identify study tactics and test-taking skills, and learn about the development of children and how to collaborate effectively with co-workers.



Lisa Nathanson—senior (swimming), 3.82 GPA, double major in psychology and business administration, honors student. Competed in 2008 and 2012 Olympic Trials and was an NCAA All American in 2012.

Nathanson believes that studying psychology has made her more aware of the mental aspects of athletics, both when competing and training. Swimming requires a lot of mental focus, first on technique, in order to train effectively, and second, on confidence for racing. She has used what she has learned about psychology to help her excel during her swimming career at MU. Nathanson's future plans include studying behavioral genetics, and she already has applied to various graduate schools. Her career interests also include management, human resources, and higher-education positions, as well as possibly coaching high school swimming at some point.



Haley Krentz—senior (soccer), 3.52 GPA, double major in psychology and health sciences. Started all 22 games in senior year. Ranked second on team for points (16 goals) and second in SEC for total assists (10) in 2012.

According to Krentz, one of the most important aspects to being a collegiate athlete is that it requires mental toughness. She defines mental strength as having the capability and drive to gut out a hard workout, maintain a high level of focus throughout an entire game, and remain positive when things do not go your way. Krentz has used psychology in sports by using positive affirmations and thinking in the present versus the past and future. She has also used strategies learned studying sports psychology to control her emotions, both on and off the field. Krentz plans to earn a master's degree in applied behavior analysis.



Undergrad Research at the Capitol

Two senior psychology majors presented their honors thesis research projects to the Missouri State Legislature at Undergraduate Research Day at The Capitol in Jefferson City, Mo., on March 7th. **Allison Siroky's** project examined how parental monitoring of adolescents' activities and adolescents' disclosure to parents about their activities impact adolescents' academic achievement. **Chris Shepard's** project examined how positive and negative sibling-relationship qualities are related to different aspects of adolescents' self-worth. Both are mentored by Assistant Professor Nicole Campione-Barr.



Sports-related Research

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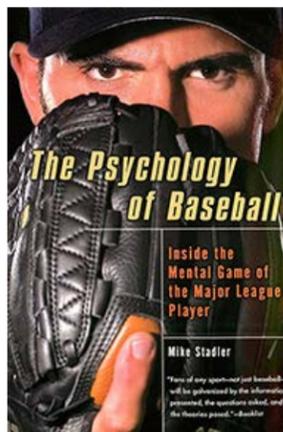
was the right anterior insular cortex, located about an inch beneath the right temple. This structure is known to mediate awareness of our emotional reactions, which is congruent with Campione-Barr's subjective report: When you are trying to acquire a difficult skill and finally get it right, it's a high.

Research on athletic skill acquisition is clinically relevant, according to Professor Scott Frey. (Frey is a new faculty member whose endowed professorship was made possible by a generous gift from alumnus Richard Miller and family.) Rehabilitative medicine might learn from sports psychology, for instance, with regard to laboratory-based training principles such as intermixed

and multi-context practice. Intermixed practice on two different skills, say, lay-ups and free throws, is more beneficial than an equivalent amount of separate, massed practice. Similarly, Frey points out, varying the context from one training session to the next (different ball courts, teammates, even shoes) can be expected to lead to a more robust memory trace.

Conversely, research on rehabilitation can inform sports science. Frey's fMRI research indicates, for example, that learning to use a tool apparently alters one's body schema. Of course, anyone who has taken tennis lessons knows that players are supposed to think of the racquet as an extension

of his or her hand. Similarly, a golf club is to be treated as a rigid extension of the left forearm; a pool cue, like a fluidly moving segment of the right arm. An understanding of how brain activations vary during the planning and execution of actions involving tools could lead to improved training regimes for the use of limb prostheses as well as baseball bats.



National Newsmakers

The researchers highlighted below have been publicized far and wide, in the *Times of India*, the Huffington Post, and on *CBS News* and *Science Daily*, among others.

Doctoral student Elizabeth Martin found that Facebook activity provided a window into the psychological health of study participants. Her findings were published on Yahoo! News and MSNBC and in *Times of India*.

Assistant Professor Victoria Shaffer found patients were dissatisfied with their care when physicians relied on technology to make diagnoses. These findings were published on ModernPhysician.com and Sciencecodex.com, and in *Becker's Hospital Review*.

Assistant Professor Nicole Campione-Barr identified two specific types of sibling conflict that can have different effects on a youth's emotional health. With this information, parents can learn how to bring peace to the home and encourage their children's healthy psychological development. These findings appeared in *U.S. News*

and *World Report*, *USA Today*, and on MSN.com.

Associate Professor Denis McCarthy found in two studies that people who reported drinking and driving also exhibited "urgency," or a lack of emotional self-control, especially while drinking, suggesting that when some people become intoxicated, they may be more likely to choose the convenience of driving themselves home instead of waiting for a taxi. His findings were published in *British Psychological Society*, *Columbia Daily Tribune*, and on *Science Daily*.

A study by Curators' Professor of Psychological Sciences David Geary found that girls and boys started grade school with different approaches to solving math problems. Girls' approach gave them early advantage, but by the end of sixth grade, boys had surpassed the girls. Understanding these results may help teachers and parents guide students better. These findings appeared on *Futurity*, *Science Daily*, *Health Line Plus*, and *MSNBC*.

Young people who watch more movies with sexual content also tend to engage in more sexual behavior and begin sexual activity at an earlier age, according to a study by postdoctoral fellow Ross O'Hara. This was published in *U.S. News and World Report*, *Daily Mail* (U.K.), and it was broadcast on *The O'Reilly Factor*.

Infants have not yet developed the ability to differentiate between large and small numbers of objects, according to research by Assistant Professor Kristy vanMarle. The story ran on *Futurity*, *Science Daily*, and *Red Orbit*.

Young people whose sexual self-definition didn't fall into exclusively heterosexual or homosexual categories tended to misuse alcohol more frequently, found Research Assistant Professor Amelia Talley. Her findings were published in the *New York Daily News*, and on *Eurekalert* and *Science Daily*.

Professor Kennon Sheldon developed a model to help people maintain

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Curriculum Changes, New Degree Options Creation of Bachelor of Science Degree and Master's of Applied Psychometrics

By Denis McCarthy & Nicole Campione-Barr

One of the challenges of higher education is how best to respond to economic, intellectual, and technological changes that alter both training opportunities and job prospects for graduates. In this vein, the Department of Psychological Sciences is working to develop two new programs that are in line with emerging opportunities in psychology—a bachelor of science (BS) degree and a master's degree in applied psychometrics. In developing these programs, the department sought to take advantage of the expertise of our faculty and to provide our students with scientific skills that can make them even more competitive for graduate training or high-quality jobs in the field of psychology.

Bachelor's of Science Track

The department consistently finds itself at the top of the list for number of undergraduate majors at MU. With these large numbers, however, comes a variety of interests in and reasons for studying psychology. In an effort to account for this, a new bachelor of science-degree track will be offered to students (in addition to the bachelor of arts degree all majors currently receive) as of fall 2013.

Director of Graduate and Undergraduate Studies Alan Strathman has spearheaded this effort. "Included in the approximately 1300 psychology majors are students with postgraduate plans as diverse as can be. On every survey, though, about 20% of our majors indicate an interest in attending graduate school in psychology or a psychology-related field. Another small group expresses an interest in attending medical school," Strathman says. "Faculty members felt like we could better prepare these students by offering them a more rigorous, science-intensive option. By requiring a higher-level statistics course and a 12-hour science track, our stu-

dents with interests in graduate and medical school will be better prepared to excel in those endeavors."

Master's in Applied Psychometrics

For some time, the number of people with advanced training in quantitative psychology has lagged behind demand for people with these skills. Partially in response to this, the department developed a separate quantitative psychology program in the late '90s. The program has grown quickly; it has six faculty members and offers both a minor in quantitative psychology for all doctoral students as well as a doctoral program in quantitative psychology. In addition to these programs, the department is currently working to develop a master's-level program in applied psychometrics.

The program will provide in-depth training in the statistical and method-

ological skills required for developing and interpreting psychological tests. The goal of the program will be to prepare graduates for positions geared toward industry. There has been a steady increase in the use of testing in a number of areas, including education, employment, and medicine. Perhaps the largest increase has been in education resulting from programs such as No Child Left Behind that rely on performance-based metrics to evaluate schools and school districts.

The program will require a three-semester commitment, with four courses per semester. Unlike other graduate programs in the department, the master's in applied psychometrics will not require a thesis or independent research project. Instituting this degree will broaden the department's training in quantitative psychology to all our graduate students, while simultaneously allowing the department to fill a vital nationwide need in training for applied psychometrics.

New Faculty in Social & Personality

Laura Scherer received her doctorate in social psychology in 2010 from Washington University in St. Louis. From 2010 to 2012, she was a postdoctoral fellow at the University of Michigan's Center for Bioethics and Social Sciences in Medicine.

Scherer's research explores when, how, and to what advantage people use spontaneous associations and "gut feelings" when making decisions. People often have spontaneous associations and feelings that color their judgments. Her work has examined how these automatic processes influence evaluations of people (e.g., racial bias), and how judgment contexts can alter the activation of such bias. More recently, her research has addressed how spontaneous feelings, versus deliberative reasoning, can influence life-altering medical decisions. This latter work aims to inform the development of patient-decision support tools.

When she is not doing research, Scherer spends time hanging out with her husband and three-year-old daughter, trail running, biking, and playing bluegrass guitar.



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The department appreciates hearing from alumni and friends. Send announcements or milestones to the address listed above.

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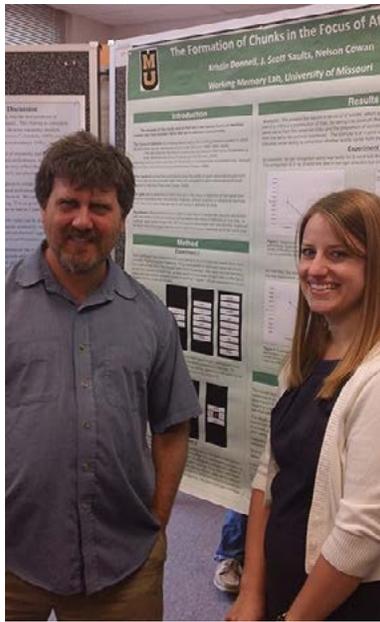
Sixth Annual Psychology Day, April 26

Michael C. Roberts (see Page 6) will be the keynote speaker for Psychology Day this year. His presentation is titled "Clinical Child and Pediatric Psychology: Developments in Training, Research, and Applications."

During the day, undergraduate honors students and graduate students will present findings from their research. The day will end with the traditional reception in the cast gallery at the Museum of Art and Archaeology in Pickard Hall on campus.

All alumni are invited to attend Psychology Day. For more information, or to let the department know you are coming, contact Kelly Davis at 573-884-6277 or daviskel@missouri.edu.

Want to know more? Please visit the department's Web site at psychology.missouri.edu.



Professor Jeff Rouder and Kristin Donnell, BA '12.

National Newsmakers

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higher levels of happiness consisting of two major components: the need to keep having new and positive life-changing experiences and the need to keep appreciating what you already have and not want more too soon. His findings were publicized on Fox News, ABCNews.Go.com, and in *The Globe and Mail* and *The Vancouver Sun* (Canada).

Professor Jamie Arndt and doctoral student Kenneth Vail found that thoughts of mortality can lead to decreased militaristic attitudes, better health decisions, increased altruism and helpfulness, and reduced divorce rates. Their findings were published in the *Daily Mail* and *Telegraph* (U.K.), and on Science Daily and Men's Health.