THE FLUIDITY OF TIME
Scientists Uncover How Emotions Alter Time Perception

PLUS
Barbara Landau on Shapes and Language
Integrative Lifespan Research at Cornell
The study of time perception serves as a hallmark of integrative science, mixing linguistics, cognitive neuroscience, and attention research to explore the ways people feel the minutes and hours pass. And increasingly, this research is focusing on the role that emotion plays in distorting our sense of time.

Having Fun When Time Flies
An experiment shows how manipulating the clock can affect our engagement and enjoyment.

Presidential Column
Minding Education
Findings and concepts in psychological science can spark not only educational innovation, but new ways to assess whether specific teaching methods are effective, APS Fellow Stephen M. Kosslyn says in a guest column.

APS Past President Walter Mischel (1930–2018)
The pioneering scientific expert on children’s self-control was a driving force behind the advancement of integrative science and international collaboration.
Mahzarin R. Banaji and Colleagues Receive Golden Goose Award

The Harvard University psychological scientist, along with APS William James Fellow Anthony Greenwald and APS Fellow Brian Nosek, is being honored for foundational research on implicit associations and social cognition.

Award Address

Learning Language Outside the Box

APS William James Fellow Barbara Landau challenges enduring theories on the complex interplay of language, sensory input, and thought processes.

Department Profile

Crossing Disciplines and the Lifespan

Cornell University’s Department of Human Development incorporates not only various aspects of psychological science, but also law, sociology, history, and more. APS Fellow and Department Chair Qi Wang details the department’s successes.

The Chronicles of a ‘Me-Searcher’

Sarah Gaither shares how her experiences as a biracial individual have informed her psychological research on identity.
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KEYNOTE SPEAKERS

Arrested Development or Adaptive? The Adolescent and Self Control
BJ Casey
Department of Psychology, Yale University, USA

Evolution of Emotions and Empathy in Primates
Frans B.M. de Waal
Department of Psychology, Emory University, USA, and Utrecht University, The Netherlands

The Brain in the Ecosystem: Cognition, Culture, and the Environment
Atsushi Iriki
Laboratory for Symbolic Cognitive Development, RIKEN Brain Science Institute, Japan

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Minding Education

After two remarkable careers, one in cognitive science, overlapping the next in academic leadership, APS Fellow Stephen M. Kosslyn has embarked on a third, designing new institutions of higher learning based on the best evidence from the cognitive sciences. His pathbreaking work on imagery led him from elegant experiments to AI to showing that creating images, indeed, thinking, could be seen in the brain in real time. That work led to the publication of numerous influential articles and books and earned him many prizes and awards. His leadership roles at Harvard led to the directorship of the Center for Advanced Study in the Behavioral Sciences. From there he served as Founding Dean and Chief Academic Officer of the Minerva Schools, an innovative international university about to graduate its first class. In this column he outlines some of the principles he has applied to designing educational institutions in the 21st century.

-Barbara Tversky, APS President

It is a truism that studies of learning, memory, reasoning, and related abilities should inform best practices in education and — by the same token — that the goal of educating people effectively should guide at least some research in these fields. Such sentiments are common but they are not often acted on systematically.

I have had the rare privilege of using psychological science to help develop from scratch not one but two college curricula — first at the Minerva Schools at KGI and currently at a new educational institution that will be announced later this month. I began with a crucial fact that has been documented extensively (e.g., Freeman et al., 2014): Active learning is vastly more effective than passively watching lectures. Active learning relies on having students use information in some way, such as in debates, role playing, or group problem-solving.

The superiority of active learning is not a surprise, given what we have discovered about learning and memory. This literature can be organized into a set of 16 principles that fall under two large “maxims” (Kosslyn, 2017). One of these maxims is “Think it through.” The more you pay attention to and deeply process information, the more likely you are to understand and remember it. For example, the principle of deliberate practice (which falls under this maxim) leads us to use feedback to focus on what needs to be learned and to pay attention to and deeply process that specific information (e.g., Ericsson, Krampe, & Tesch-Romer, 1993). For instance, if you want to learn how to pronounce a particular French word, you would say the word and have a native speaker repeat it back correctly. You would — and here’s the key bit — pay attention to the disparity between what you just said and what the native speaker says. You then would use that information to say the word again, trying to reduce the disparity between what you said and what you should say.

The other maxim is “Make and use associations.” Without question, we can improve our understanding and memory by organizing information effectively. For example, during learning we should identify and associate the to-be-learned information with “retrieval cues.” For instance, when you meet a new person, you can learn her name by thinking of someone else you know who has that name and then looking for a feature or characteristic of the new person (such as the shape of her eyebrows) that reminds you of the person you already know. That shared characteristic can help you retrieve the new woman’s name next time you see her.

Although I organized the literature into 16 principles that fall under these two maxums, Willingham (2009) organized it into nine and Graesser, Halpern and Hakel (2008) into 25. These different formulations capture the same research findings but structure them differently. I organized the findings with an eye toward using them to design active learning exercises, which drew on combinations of these principles.

To design active learning exercises, we also need specific learning objectives. The psychological sciences have contributed ways to frame such learning objectives. At Minerva we relied on the idea of production systems, popularized by Newell and Simon (1972). A production system comprises a condition/action pair; if the condition is satisfied, the action is performed. For example, the condition might be “It is raining” and the action “Get an umbrella.” We used this framework to define two types of learning objectives. For a “Habit of mind,” the condition part can become automatic (that’s why it’s called a habit), such as could occur with the learning objective “When communicating, adjust what you say based on the audience.” Recognizing the condition — communicating — can easily become automatic. The hard part is the action: Exactly how you should adjust what you say or write depends on many factors, such as your goals, the audience’s interests and knowledge, and the amount of time or space you have. Using Kahneman’s (2011) vocabulary, with practice the condition can be identified via System 1, but the action will still require working memory in System 2.

APS Fellow Stephen M. Kosslyn most recently was Founding Dean and former Chief Academic Officer of the Minerva Schools at KGI. He can be contacted via apsobserver@psychologicalscience.org.
At Minerva we also specified a second type of learning objective that we called “Foundational concepts.” In this case, the situation typically was reversed from what we found with habits of mind: Now the action was relatively straightforward but the condition was not. For example, it’s easy to do a t-test (the action), but much harder to know exactly when it is appropriate to do so (the condition). Using a production system framework to characterize habits of mind versus foundational concepts was useful because it focused instruction on what was most difficult for students to learn.

At my new institution we are again drawing on concepts from psychological science. To reach a wider range of students, we will recast production systems into a “Recognize/access/apply” cycle, where our goal will be to make as much of this process automatic as possible. We now adopt what we call a “Hacks and Heuristics” approach. “Hacks” are solutions to problems, although often not elegant solutions. Using “five-paragraph form” to write an essay is a good example. In contrast, “heuristics” are procedures that often (but not always) will lead to a solution. The example offered above about using associations to learn a person’s name is a heuristic (it will fail if you don’t already know someone who has that name).

Findings and concepts in psychological science clearly can spark educational innovation. Moreover, psychological science has developed many methods that can assess whether specific teaching methods are effective. For example, we can conduct A/B testing to assess the effects of varying one specific aspect of the pedagogy (such as assigning students to breakout groups with others at the same level versus assigning them randomly). Moreover, we can administer a pretest before a course and a post-test after it, which would allow us to assess — both at an individual and class level — how effective the course was. We can use such data to address a host of new questions. For example: Do some specific instructional techniques have better outcomes in general? Can we identify which ones are most effective for what sorts of subject matter or populations? Given the right data, the tools of psychological science will allow us to answer such questions — and the concepts from psychological science will allow us to understand such findings in ways that not only may improve educational practice but also can enrich psychological theories.

References
Does Concentration Blunt Our Sense of Smell?

Inattentive blindness is a well-studied phenomenon in psychological research. This dynamic plays out when, absent any vision problems, individuals are so focused on a visual aspect of a scene that they fail to notice some other, highly visible feature. The Invisible Gorilla experiment is among the most famous illustrations of this effect. A video shows three people in white shirts and three people in black holding basketballs. Text on the video screen challenges the viewer to count the number of passes the team in white makes throughout the video. In an experiment by APS Fellow Daniel J. Simons of the University of Illinois at Urbana-Champaign and Christopher Chabris of Geisinger Health System, most viewers could count the number of passes accurately, but about half of them missed the person dressed in a full gorilla costume walking through the middle of the basketball passers as they dribbled.

Inattentive blindness has implications for driving, aviation, and witness testimony. Psychological scientists Sophie Forster at the University of Sussex and Charles Spence at the University of Oxford wondered if attention also could cause people to “miss” smells in a similar fashion. Their research appears in Psychological Science.

Forster and Spence set up a room to be distinctively aromatic, hiding three small containers of coffee beans around the room overnight. Across the course of two experiments, they led 40 college students into the room one at a time to perform a tough visual-search task on a computer, searching for the letter “X” or “N” in a circle of similar-looking letters (“W,” “M,” “K,” “H,” “Z,” and “V”). Forty other students completed an easier version of the same task, looking for the letter “X” or “N” among a circle of lowercase “o”s.

The experimenters then took the students into another room and asked them some follow-up questions that grew increasingly leading:

- “Describe the room you just completed the task in. Try to describe it using all of your senses.”
- “Did you notice any odors in the room? If so, what?”
- “Could you smell coffee in the room?”

Students assigned to the difficult search task were far less likely to report having picked up the aroma (25% of participants) compared with participants assigned to the easy task (60–70% percent of participants). When the experimenters led the students back into the test room, all of them said they could smell the coffee. Some of them even commented that the room smelled like a cafe.

After two experiments testing the basic hypothesis, the researchers decided to see how long these smell-blocking effects might last. They had 20 students focus on the difficult visual-search task in a room that smelled strongly of coffee. Then, while still in that room, the students were asked to describe the test room and its smells. Even though they were sitting in a room with 3 open containers of coffee beans, only 30% of participants said they smelled coffee. This experiment suggested that the effects of selective attention last after even after the attention-absorbing task is over. When they left the room for a few minutes and came back, all of them could smell the aroma.

The report authors suggest that this phenomenon has advantages. Individuals could, for example, resist junk food if they’re too engaged with a task to even smell it. But this temporary loss of smell also can pose dangers, leaving a person oblivious to a fire or gas leak if she misses the threatening odors such as smoke or gas, according to their report. Some research into inattentive blindness has shown that people do notice dangerous visual cues when their attention is otherwise occupied, but the results have been inconclusive. Forster and Spence advocate for future research to see whether people fail to notice unpleasant or threatening smells when they are focused on another task.

Reference
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FRED KAVLI KEYNOTE ADDRESS
Michael Tomasello
Max Planck Institute for Evolutionary Anthropology and Duke University

PRESIDENTIAL SYMPOSIUM
Barbara Tversky (Chair)
Teachers College, Columbia University and Stanford University
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Stanford University
Andrea Kantrowitz
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CLOSING KEYNOTE ADDRESS
Betsy Levy Paluck
Princeton University

David Kirsh
University of California, San Diego
Jeff Zacks
Washington University in St. Louis
APS Past President Walter Mischel (1930–2018)

APS Past President Walter Mischel, whose landmark experiments examining children’s ability to delay gratification spawned a rich array of research on self-control and life outcomes, has passed away.

In addition to his historic contributions to the scientific understanding of self-regulation and the fluidity of personality traits, Mischel was a major advocate for the advancement of integrative research and international collaboration.

Mischel’s contributions to the study of personality are vast, but he is widely known for the “marshmallow test” — the name tied to the experiments he designed to measure young children’s willpower. In those tests, conducted at Stanford University in the 1960s, preschool children sat alone in a room with a single marshmallow placed on the table in front of them. They were told that if they could resist the temptation to eat the marshmallow (or cookie, pretzel, or other candy in subsequent versions) for a certain amount of time, they would receive two instead of one. Only a minority of the more than 600 children who participated in the experiment ate the treat immediately, and a third waited long enough to get a second helping.

Those experiments served as the foundation for a larger course of study investigating links between childhood self-control and later achievement and well-being. In follow-up research with a subset of the children from the Stanford experiments, Mischel and his collaborators, APS Fellow Yuichi Shoda and Philip Peake, found that those who had waited to receive two treats as children tended to have higher SAT scores as adolescents compared with those who hadn’t waited.

Over the decades, research inspired by Mischel and others showed that higher self-control in childhood is correlated with higher educational achievement and lower rates of drug abuse, lower rates of divorce and marital separation, fewer legal violations, and even lower body-mass index numbers. A recent conceptual replication of the marshmallow test found something that Mischel had long predicted—that the relationship between children’s self-control and their long-term outcomes depends on environmental factors such as socioeconomic status.

An APS William James Fellow, Mischel served as the association’s president in 2008–2009, sharing memorable insights on the status and future of psychological science through his Presidential Columns in the Observer. He called for psychological researchers to get over the “toothbrush problem,” the resistance to using other scientists’ theories. And he celebrated the emergence of a cumulative, integrative science that utilized fresh, sophisticated methods and incorporated techniques from neuroscience, genetics, and other areas of biology.

“There is good reason to think that psychological science is now at the brink of what can become a golden age, opening new windows into the links and reciprocal interactions between psychological and biological phenomena and processes,” he wrote.

This vision fueled the Initiative for Integrative Psychological Science, a collaboration of APS and Pan-European scientific groups that Mischel cochaired with APS Secretary Gün R. Semin (ISP-P Instituto Universitário, Portugal, and Utrecht University, the Netherlands). The initiative’s fundamental aim is to promote crossdisciplinary research covering the broadest cultural aspects of social science to the most molecular aspects of genetics. And it culminated in the launch of the International Convention of Psychological Science, a biennial event that began in 2015 in Amsterdam.

For the second ICPS in 2017, Mischel returned to his birthplace of Vienna, Austria, which he left at age 8 after the Nazis occupied the city. There, he discussed his life and career before a live audience in an interview with APS Past President Mahzarin R. Banaji, part of APS’s Inside the Psychologist’s Studio video series. That interview is one of the most widely viewed in the series, which features conversations with some of the world’s most influential psychological scientists.

Mischel was the Robert Johnston Niven Professor of Human Letters in the psychology department at Columbia University, which he joined in 1983 following faculty positions at Harvard and Stanford Universities. He was elected to the National Academy of Sciences in 2004, and received the University of Louisville Grawemeyer Award in Psychology in 2011. In 2015, he, Shoda, and Peake received the Golden Goose Award, an honor given annually to highlight US-government-backed studies that have led to major scientific discoveries and benefits to society. The scientists were recognized for their work illuminating the lifelong benefits of self-regulation, and how it varies as a function of seemingly simple variations in the social environment.

The Observer will feature a remembrance of Mischel in an upcoming issue.
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APS Past President Mahzarin R. Banaji and Colleagues Receive Golden Goose Award

APS Past President Mahzarin R. Banaji, APS William James Fellow Anthony Greenwald, and APS Fellow Brian Nosek have received the Golden Goose Award, which honors scientists whose federally funded basic research has resulted in major benefits to society. The psychological scientists are being recognized for their research on implicit bias and its effects on decision-making.

Banaji, Greenwald, and Nosek were honored in a ceremony on September 13 at the Library of Congress in Washington, DC. The award, given annually by a committee led by the American Association for the Advancement of Science (AAAS), recognizes research that may have seemed trivial when it first received US government funding, but has since returned serious benefits to public welfare. Banaji (Harvard University), Greenwald (University of Washington), and Nosek (University of Virginia) received the award based on a nomination from APS.

The implicit bias research dates back to experiments that Banaji conducted back in the mid 1980s at Yale University. In experiments modeled after APS William James Fellow Larry Jacoby’s memory research, she discovered that people could remember men’s and women’s names equally, but were far less likely to judge women’s names as famous compared with men’s names. But when she asked participants the reasons for their responses, not one of them mentioned gender as a factor.

That led Banaji to conclude that the participants carried a gender bias that eluded their own awareness.

Banaji went on to collaborate with Greenwald, who had been her graduate school advisor at The Ohio State University, on building the concept of implicit bias. With the help of a grant from the National Science Foundation, Greenwald subsequently conducted some of the first tests of the Implicit Association Test (IAT). That test measures the strength of associations between concepts (e.g., black people, the elderly) and attributes (e.g., good, bad) or stereotypes (e.g., athletic, clumsy). The time it takes for users to respond to different combinations of stimuli is thought to shed light on the mental associations they make, even when they aren’t aware of them.

“This provided a way of looking into a mind that hadn’t been looked at by other methods,” Greenwald explained at the award ceremony.

In 1996, Nosek, a graduate student in Banaji’s lab at the time, took the lead in getting the test onto a then-nascent World Wide Web. The end result was a website called Project Implicit, where members of the public can take the IAT to learn about their own unconscious biases related to race, gender, class, age, and other social and demographic categories.

“We put the test up and expected that maybe 500 people would show up in the first year,” Banaji says in a video about the work that the award committee posted online. “Then in the first month we had 45,000 completed tests. At that moment, I knew: The horse has left the barn.”

"We didn't know that we were working on something that could be so practically important."

-APS William James Fellow Anthony Greenwald, discussing the early work on implicit-bias measurements that was honored in September with a Golden Goose Award.
More than 30 million people have taken the IAT over the past 2 decades, Nosek said. The results have illuminated racial prejudices, political preferences, gender biases, and other attitudes that would not likely show up in self-report measures. Banaji and Greenwald have helped thrust the term “implicit bias” into public awareness, thanks in part to their 2013 mass-market book *Blind Spot: Hidden Biases of Good People*.

"Today it isn’t just a term used by the scientific community but has become a part of our cultural lexicon," the Golden Goose Award website states. "Political candidates debate it. Businesses use it to improve the quality of decision-making. Teachers use it to explore if they are teaching all students equally. Police departments are engaging with it to improve law enforcement practices. Legal scholars and practitioners are asking about implications for the law and creating unbiased courtrooms. Clinical psychologists use it to detect mental states and track whether treatments are effective. And doctors and healthcare providers use the test to ask if their bias may lead them, quite implicitly, to behave in ways that are opposed to their own values of equal treatment.”

During the award ceremony, Banaji, who has also been honored with APS William James Fellow Award for her work, referenced some of the most important applications of the IAT. She drew strong applause from the audience when she cited the work of her Harvard colleague, APS Fellow Matthew Nock, who has used the test to measure self–death associations that may predict an individual’s risk of attempting suicide.

This marks the second time in the 7-year history of the award that psychological research has been honored. In 2015, APS Past President Walter Mischel, APS Fellow Yuichi Shoda, and Philip Peake received the award for their work on childhood self-control and later life outcomes.

Other recipients of the 2018 Golden Goose Awards are Stanley Cohen, who discovered cytokines, the small proteins that cells use to communicate; and the late Bruce Glick whose research on a gland found in geese has led to new frontiers in cancer treatment.

The congressionally endorsed Golden Goose Awards were inspired by US Rep. Jim Cooper (D-TN), who proposed the recognition as a way to increase understanding of the nature of science. In addition, the Golden Goose is meant as an antidote to attacks on science such as the Golden Fleece award, a gimmick created by the late US Sen. William Proxmire (D-WI) to highlight what he judged wasteful federal spending on basic science, a decision often made just on the basis of a study’s title or abstract.

Cooper envisioned an award that would highlight examples of seemingly obscure, federally funded studies that have led to major discoveries and significant societal impact. Every year, a selection committee made up of distinguished scientists reviews the nominations for the award and selects the winners.

Several organizations, including AAAS, the Association of American Universities, and the Progressive Policy Institute, took up Cooper's idea and began issuing the awards annually in 2012. APS is among the sponsors of the award.

Read more about the implicit bias research in the Observer (bit.ly/2QvtYLW) and on the Golden Goose Award website (bit.ly/2NaDgPg).

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Learning Language Outside the Box

Barbara Landau Uses Shapes to Study Linguistic Development

From the Whorfian Hypothesis — the idea that the language you speak may cause you to think about the world in unique ways — to the theory that discovering any language at all causes a radical transformation of thought, psychological scientists have been studying the ways in which language shapes learning for decades. But, says APS William James Fellow Barbara Landau (Johns Hopkins University), both of these theories have their flaws — and she’s proposing a third theory to counter them.

“Some of our information comes from exploring the world either visually, or haptically if we're blind — but some information and some knowledge comes specifically from the mind itself,” said Landau, who has studied blind children to determine how they learn about the world, at her award address at the 2018 APS Convention in San Francisco. In the past, philosophers such as John Locke had suggested that “if you don’t have sensory input to feed a lexical concept or a word for that concept, then you will never develop them,” she added, but that notion simply hasn’t held up.

In studies with APS Fellow Lila R. Gleitman, for example, Landau found that congenitally blind children could still acquire the words “see” and “look” and the concepts that underlie them, despite not having firsthand knowledge of them. When told to “look up,” these children reached up with their hands, exploring the space above them in a similar way to their sighted counterparts, who turned their heads upward to do the same thing even when blindfolded. Thus, while it’s clear that some knowledge is visually obtained, it’s equally obvious some is absorbed via other avenues, she said.

With this in mind, one of Landau’s main questions across her decades of language research has been: Does language change thought? In attempting to answer this query, Landau has gleaned insights from other theories — most notably the aforementioned Whorfian Hypothesis and the “radical transformation” hypothesis — while still finding them lacking.

The Whorfian Hypothesis, put forth by Edward Sapir and Benjamin Lee Whorf, suggests that learning a particular language (language A vs. language B) affects the way you think. As an example, Landau cited an experiment in which participants who spoke different languages were shown several patches of color with one outlier and asked to find the outlier. The outlier was either a different shade of the same color (green vs. lighter green; within-category) or a different but similar color (green vs. blue; between-category), and the colors were projected to each visual field separately. The experimenters hypothesized that between-category identification would be faster for people who spoke languages that had verbal distinctions between the two colors than for those who did not.

As Landau explained, “Languages tend to cut up the space of colors in very different ways across different languages … the idea here is that learning a particular language shapes non-linguistic categories in accord with native language distinctions.” And indeed, between-category identification was found to be faster among those who spoke languages that made the verbal distinction, but only when the colors were presented to the left brain hemisphere — the hemisphere where language usually is processed. Thus, according to the study authors, “Language may affect perceptual discrimination.”

Continued on Page 15
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Another approach to language learning is the notion that having any language at all radically shapes thought processes. Researchers studying spatial orientation, including Kenneth Cheng and APS Past President C. R. Gallistel, have found, for example, that if you put a rat in a room and give it a food reward, then disorient it, then put it back in the room, it will sometimes go to the place where it received the reward but also will sometimes go to the geometrically equivalent place with no food (that is, directly across from to the food-reward site). With no language, rats rely entirely on the geometry of the surrounding space, often ignoring other salient cues.

Replicating these experiments with children and toys, psychological scientists including Linda Hermer and APS William James Fellow Elizabeth Spelke have found a similar phenomenon in children 18 to 24 months old, with the youngest children behaving the most like rats. Older children with language abilities, however, are more able to locate the correct reward site. “Why does a young child — a toddler — act just like a rat, but a 4-to-6-year-old acts like an adult — that is, they can combine the geometry with the landmarks [of the room]?” Landau asked. The answer, according to Hermer, Spelke, and colleagues, is that “It’s language itself — having a language — that is causing the difference between the rat and the human.”

While both of these approaches to the intersections of language, learning, and cognition have valuable insights to offer, said Landau, they also each present “critical weaknesses.” The argument that a specific language shapes thought is problematic, she said, because it’s unclear what is being shaped — could it be perception or memory rather than thought itself? In addition, language is used implicitly in non-linguistic tasks (e.g., instructions, responses), which makes it difficult to code for more nuanced nonverbal responses. The proposition that any language radically transforms thought is incomplete, Landau noted, because the mechanism is unspecified. It’s clear that language is not necessary for all thought — so what, exactly, is it necessary for?

Landau’s answer to these queries is encapsulated in the recoding hypothesis: “Language provides a rich formalism which in itself confers an advantage for cognition,” she said. “What it means to have a language is to have a formalism that really matters when you’re encoding your experience … language recodes what we see.”

To further this hypothesis, Landau and colleagues conducted a case study with several variations. To start, they showed 4-year-old children a half-red, half-green block of color, removed it for a second, then presented three similar blocks — the same block, a reflection, or a diagonal split — and asked the children to pick out what they had just seen.

The researchers implemented several language manipulations. The first, a simple “Look at this!” or “Look at this! This is a dax,” succeeded by the question “Which one is exactly the same as the one you just saw?” produced correct guesses from the children approximately 60% of the time. The second, “Look at this! The red is on the left,” followed by the same question, brought correct choice rates up to 80%, but all other manipulations — “Look at this! Let’s see where the red is,” combined with flashing the red part of the block; and “Look at this! Let’s see where the red is,” in conjunction with increasing the size of the red part of the block and asking children to point to it — decreased the correct guesses back down to 60%.

Landau also had the children perform a task to show whether they could identify top versus bottom (95% could) and left versus right (between 0 and 80% could). She theorized that, since the “left” condition produced the most correct results, those children who knew their directions would do best on the color task. But that wasn’t the case.

“If you know your lefts and rights — if you have a long-term representation of these things and you just bring it to bear in the task — then kids who do better on ‘left/right’ should also do better in the matching task,” she explained. “That turns out not to be true … What this means to us is that they don’t actually have a long-term representation of these terms that they’re bringing to bear, but they’re able to use it right in the moment when we say to them, ‘Red is to the left of green.’”

To see whether this might work in a more relatable setting, Landau replicated the experiment with more comparative words (e.g., “Look at this! The red is prettier/nicer/lighter/brighter than the green.”). The results held steady at 78.8% — almost as accurate as those of the “left” condition. “This asymmetrical concept — prettier — actually works for 4-year-olds to carry over the binding of the color location in this very local context,” she explained.

It’s clear from these experiments, Landau said, that language does enhance thought in the moment; it’s just a temporary change. “Language can recode via a powerful formalism,” she explained. “The effects are momentary and become more automatic early in development. They confer advantage for cognition more generally.”

References

To watch video of Barbara Landau’s award address, visit www.psychologicalscience.org/rr/shapes.
To submit a nomination or for more information, including past recipients and

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Department Profile

Crossing Disciplines and the Lifespan

In a new recurring feature, the Observer showcases university labs and departments that have advanced integrative science. In the inaugural installment, APS Fellow Qi Wang talks about Cornell University’s Department of Human Development, which she chairs.

What is the history of the department? What was its genesis?
The Department of Human Development at Cornell University is an interdisciplinary entity that uses multiple approaches, methods, and levels of analysis to study human development across the lifespan and integrates basic and translational research to enhance development and well-being in diverse contexts and populations. The department distinguishes itself with an ecological view of development as unfolding in multiple overlapping contexts. It has consistently been ranked as one of the top human development programs in the country.

The faculty have come to include scholars of multiple disciplines and methodologies. The department has a professorial faculty of 24. Undergraduate majors typically number between 250 and 300, with approximately 35 masters and doctoral students in residence.

How has it evolved over the years?
The department has become increasingly dynamic and integrative. We have placed growing emphasis on interdisciplinary and integrative approaches that span areas of psychological science (cognitive, developmental, clinical, social, cultural), law, neuroscience, sociology, education, and history. We recently recruited a computational political scientist who studies social networks, political communication, online social support, and health. The department has also evolved to have an increasing focus on culture and diversity, examining basic developmental processes in relation to a variety of demographic factors including socioeconomic status, gender, race and ethnicity, and cultural background.

Furthermore, there is a genuine appreciation for advanced methodologies as reflected in the addition of neuroscience, biological/life sciences, and data science in the department and for the importance of multiple levels of analysis. From the sociology and psychology of health and aging to the neuroscience of memory, emotions, and decision-making, the department mixes equally observational and correlational studies with rigorous experimental approaches and interventions within and outside the laboratory. The department has made a strong investment in neuroscience, being the only human development program in the country to house an MRI facility. The department is also unique among human development programs in housing a nonhuman animal laboratory. This puts the department in a unique position to lead in examinations of lifespan developmental changes in the brain and behavior and how they are shaped by diverse environmental contexts, early life experiences, and genes and their expression. The recent addition of social networks research and data science further extends our interdisciplinary strengths.

While the department has a long tradition of outreach, this has grown to include an increasing focus on evidence-based translational research. The department embraces translational activities and “use-inspired research,” seeking evidence-based solutions for real-world problems. Both its pedagogy and outreach are research-based — often research conducted by the very faculty member teaching a particular course or engaging in a particular outreach activity.

What would you describe as the most surprising or unexpected collaborations that psychological scientists have been able to join or lead within the department?
Every generation brings new scholars from diverse disciplines to our department. Their research transforms the department into new directions and in the meantime also is transformed by the interdisciplinary culture of the department. Often they collaborate across disciplinary lines. One example is an outstanding young neuroscientist we hired, who began a collaboration with a sociologist in our department who studies aging. It is the sort of collaboration that would not be likely

Continued on Page 21
The pre-conference Teaching Institute features talks from leading experts in the research and application of empirical approaches to teaching psychological science.

## Opening Plenary
### Using Virtual Reality for Implicit Learning
Mel Slater  
*Department of Clinical Psychology and Psychobiology, University of Barcelona, Spain*

## Closing Plenary
### Why Good Teaching Evaluations Might Reward Bad Teaching
Wolfgang Stroebe  
*Department of Psychology, University of Groningen, The Netherlands*

## Distinguished Speakers

### Lisa Feldman Barrett  
*Department of Psychology, Northeastern University, USA*

### Jane Foster  
*Department of Psychiatry and Behavioural Neurosciences, McMaster University, Canada*

### Phil Higham  
*School of Psychology, University of Southampton, United Kingdom*

### Lydia Krabbendam  
*Department of Educational Neuropsychology, Vrije Universiteit Amsterdam, The Netherlands*

### Brian Scholl  
*Department of Psychology, Yale University, USA*

### Scott Stoltenberg  
*Department of Psychology, University of Nebraska, USA*

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Organized By:

- **Douglas A. Bernstein**  
  *Department of Psychology, University of South Florida, USA*

- **Nathalie de Kernier**  
  *Département de Psychologie, Université Paris Nanterre, France*

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Presented by the [Association for Psychological Science](https://www.apa.org) and the [APS Fund for Teaching and Public Understanding of Psychological Science](https://www.apfonline.org), and cosponsored by the [Society for the Teaching of Psychology](https://www.stpo.org).  

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in a homogenous setting. There are many similar instances of cross-disciplinary collaborations to study machine learning, affective neuroscience, decision-making, and so forth, within and outside of the department. The disciplines that have been involved in HD faculty’s collaborative research include law, particle physics, mathematics, microbiology, biomedical engineering, business, behavioral economics, communication, and information science.

Has forming an interdisciplinary entity such as this made it easier or more challenging to obtain grant funding and get researched published? Our interdisciplinary focus has made us more competitive in obtaining grant funding and getting the research published. Specifically, our research often cuts across the more traditional categories of psychology and amplifies their applied nature.

On the one hand, our faculty has demonstrated “mainstream” excellence. Our publications appear in all of the top specialty psychological science journals, the top general psychology journals (Psychological Review, Psychological Bulletin, etc.), and the top general–general journals (Nature, PS, The Journal of the American Medical Association [JAMA], Proceedings of the National Academy of Sciences). Our faculty also frequently publish in top specialty journals in nondevelopmental core areas of psychology. In addition to the research being of the highest quality, a key reason for our success in publishing is that our research targets theoretical and empirical questions that our peers perceive as important, no matter whether they do or don’t fit into intuitive categories.

On the other hand, our faculty also excel in many integrative and interdisciplinary publishing outlets and make broad scholarly contributions beyond their core areas and beyond psychological science. Our publications also appear in nonpsychology journals such as those focused on sociology, education, anthropology, and medicine, and as a result our work has reached vastly different audiences. Several faculty have collaborated with researchers in medical fields and published in major health-related journals with high impact factors, including JAMA, Pediatrics, Annals of Internal Medicine, New England Journal of Medicine, and the American Journal of Public Health.

To read the full interview, go to www.psychologicalscience.org/r/cornell.
THE ASSOCIATION FOR PSYCHOLOGICAL SCIENCE PRESENTS

ICPS 2019 Integrative Science Symposia

Changing Minds and Behaviours Throughout Society: The Greatest Challenge of Our Times

Tom Beckman, Global Head of Creative, Prime Public Relations, Sweden
Enny Das, Centre for Language Studies Faculty of Arts, Radboud University Nijmegen, The Netherlands
Stephen Fleming, Wellcome Trust Centre for Neuroimaging, University College London, United Kingdom
Susan Michie, Centre for Behaviour Change, University College London, United Kingdom

Our Minds Are Not Our Own: The Role of Guts and Germs

Alyssa N. Crittenden, Department of Anthropology, University of Nevada, Las Vegas, USA
Robert Dantzer, Department of Symptom Research, Division of Internal Medicine, The University of Texas MD Anderson Cancer Center, USA
Jane A. Foster, Department of Psychiatry & Behavioural Neurosciences, McMaster University, Canada
William P. Hanage, Department of Epidemiology, Harvard University, USA
Mats Lekander, Department of Clinical Neuroscience, Karolinska Institutet, Sweden

The Consequences of the Evolution of Language on the Mind

Lera Boroditsky, Department of Cognitive Science, University of California, San Diego, USA
José Morais, Centre for Research in Cognition & Neurosciences, Université Libre de Bruxelles, Belgium
Jennie E. Pyers, Department of Psychology, Wellesley College, USA
Alexandra Rosati, Department of Psychology, University of Michigan, USA

Collective Emotions in Cooperation and Conflict

Emma Cohen, Institute of Cognitive and Evolutionary Anthropology, University of Oxford, United Kingdom
Paolo Gerbaudo, Department of Digital Humanities, King’s College London, United Kingdom
Eran Halperin, School of Psychology, Interdisciplinary Center, Israel
Bernard Rimé, Faculté de psychologie et des sciences de l’éducation, Université catholique de Louvain, Belgium
Christian von Scheve, Institute of Sociology, Freie Universität Berlin, Germany
Dan Zahavi, Department of Media, Cognition and Communication, University of Copenhagen, Denmark
Human Culture: What Is It and How Does It Work?

Marcus Feldman, Department of Biology, Stanford University, USA
Miriam N. Haidle, Heidelberg Academy of Sciences and Humanities, Germany
Henri Moll, Department of Psychology, University of Southern California, USA
Dan Sperber, Institut Jean Nicod, France

How Changing Our Bodies Changes Our Selves

Henrik Ehrsson, Department of Neuroscience, Karolinska Institutet, Sweden
Carolyn Mair, Psychology for Fashion, United Kingdom
Nichola Rumsey, Centre for Appearance Research, University of the West of England, Bristol, United Kingdom
Melvyn Slater, Department of Clinical Psychology and Psychobiology, Universitat de Barcelona, Spain

From the Heart to the Eye: Interoception and Awareness

Lisa Feldman Barrett, Department of Psychology, Northeastern University, USA
Martin Paulus, Laureate Institute for Brain Research, USA
Catherine Tallon-Baudry, Laboratoire de Neurosciences Cognitives, Ecole Normale Supérieure, France
Manos Tsakiris, Department of Psychology, Royal Holloway, University of London, United Kingdom

Studying Perception: Is It Worth It?

Ned Block, Department of Philosophy, New York University, USA
John McGann, Department of Psychology, Rutgers, The State University of New Jersey, USA
Yael Niv, Princeton Neuroscience Institute and Department of Psychology, Princeton University, USA
Aude Oliva, Computer Science & Artificial Intelligence, Massachusetts Institute of Technology, USA
Brian Scholl, Department of Psychology, Yale University, USA

Integrative Science Symposia explore major scientific topics in a cross-cutting, interdisciplinary manner, with presentations from investigators in neuroscience, genetics, anthropology, linguistics, and many other fields.
Humans have a fitful relationship with the clock, if modern idioms are any indication. Time flies when we’re having fun. It drags when we’re bored. Sometimes it’s on our side; other times it’s racing against us.

The gap between how time passes and how we experience it has engaged psychological scientists for more than 150 years. Pioneers in psychophysics such as Gustav Theodor Fechner and Ernst Heinrich Weber set the foundations for this line of research in the 1800s as they explored the intricacies of human perception.

Flash forward to the 21st century, and the study of time perception serves as a hallmark of integrative research, mixing linguistics, neuroscience, cognitive psychology, and attention research to explore the ways people feel the minutes and hours pass.

The Internal Timekeeper
For decades, scientists conceptualized time perception according to theoretical models that essentially posited a biological stopwatch in the brain, which slowed and accelerated in line with attention and arousal. More recently, researchers have been searching for the precise brain areas responsible for internal timekeeping. Using newer technologies such as functional MRI, scientists such as APS Fellow Warren H. Meck at Duke University have concluded that a large network of neural areas, not just a single brain structure, underlies time processing. And neuroscientists in Europe, including Nobel laureate Edvard Moser, have been using optogenetics (a biological technique used to control and monitor individual neurons) with mice to identify specific brain regions that affect our subjective timekeeping.

In the midst of the neuroscientific focus on time perception, scientists continue to recognize the integral role that happiness, sadness, fear, and other emotions play in the way we feel the passing of seconds and minutes. APS James McKeen Cattell Fellow Mihaly Csikszentmihalyi of Claremont Graduate University first identified the way enjoyable experiences can affect our focus on time. Csikszentmihalyi famously coined the term
“flow” to describe the experience of being so happily immersed in an activity — be it athletics, work, or a creative project — that all distractions are shut out. A key feature of the flow experience is a distorted sense of time — typically a feeling that time has passed faster than usual.

Subsequent research has identified the sheer pursuit of rewards, from experiences to material goods, as an ingredient for temporal illusions. These studies often incorporate the oddball effect — a phenomenon in which encountering novel stimuli inflates perceived durations. Dartmouth University psychological scientist Peter Ulric Tse and colleagues demonstrated this effect in 2004 when they showed research participants repetitive images flashing on a computer screen, followed by a single novel image. Although all the images stayed on the screen for the same amount of time, participants reported that the oddball image seemed to last longer than the others.

Psychological scientists in the Netherlands recently demonstrated the influence of potential rewards tied to the oddball effect. In a series of lab experiments, Michel Failing and Jan Theeuwes of Vrije Universiteit Amsterdam showed participants a series of images, one of which was different from the rest. The participants indicated whether the oddball image stayed on screen for a longer or shorter period than the rest of the images. When they could earn a reward for a correct answer in the form of a large number of points, they perceived the oddball images as prolonged compared with oddballs that earned them no points.

The Pursuit of Pleasure

Being presented with the opportunity to earn a reward may make seconds or minutes seem prolonged, but desire may have a rather different effect, according to a 2012 study conducted at the University of Alabama. In a series of experiments, psychological scientists Philip Gable and Bryan Poole examined “approach motivation,” the drive to achieve goals, positive experiences, or vital resources such as food and water. Relative to neutral states or positive states with low approach motivation, positive states with high approach motivation shortened perceptions of time, they found.

In one of the experiments, the researchers trained participants to tell the difference between pictures shown for a ‘short’ (e.g., 400 ms) or a ‘long’ (up to 1600 ms) period of time. The participants then viewed pictures that were neutral (geometric shapes), positive and low in approach motivation (flowers), or positive and high in approach motivation (delicious desserts). For each picture, they had to indicate whether the picture had been displayed for a short or long period of time.

Just as the researchers hypothesized, the participants perceived the enticing pictures of desserts as having been displayed for a shorter amount of time (regardless of the actual duration) than either the neutral geometric shapes or the pleasing pictures of flowers.

The researchers also found that the perceived amount of time for the enticing pictures was related to when participants had eaten that day. Those participants who had eaten recently, which presumably lowered their approach motivation for food, judged the dessert pictures as having been displayed for longer periods of time than did their hungrier peers.

A second study, in which participants reported time as passing faster when they looked at the dessert pictures with the expectation that they would be able to eat those desserts later, confirmed these findings.

Gable and Poole propose that states high in approach motivation make us feel as though time is passing quickly because they narrow our memory and attention processes, helping us to shut out irrelevant thoughts and feelings.

“Just being content or satisfied may not make time fly,” Gable said when the study was published, “but being excited or actively pursuing a desired object can.”

The study authors suggest this phenomenon may have a helpful function: If reaching a goal requires waiting or sustained hard work across a period of time, it would be an advantage if that period seems brief.
Taking a Pause

Other positive emotions may have the opposite effect on time perception, studies show. In 2012, behavioral science researchers from Stanford University and the University of Minnesota published their results from a trio of experiments examining the consequences of awe-filled experiences. The participants in these experiments engaged in activities such as watching awe-inspiring videos of people in everyday situations encountering and interacting with huge animals or watching waterfalls, for example. Compared with participants who completed less awe-inspiring activities, participants in the awe conditions reported feeling time passing more slowly. Additional findings from the experiments suggest that awe caused people to feel more “in the moment” and led them to see time as more abundant.

Nature itself may slow our sense of time. In a series of studies, psychological researchers at Carleton University in Canada tested whether people perceived time moving more slowly in nature compared with urban settings. In experiments that included both virtual and actual environments, participants experienced walking through either natural surroundings such as a forest trail or bustling urban locations such as New York City. They estimated the duration of the experiences in minutes and seconds. The first three experiments involved imagery, and researchers found no significant difference in estimates of actual time duration between the nature and urban conditions. But in all three studies, the participants in the nature condition reported feeling a slower passage of time compared with those in the urban setting. And when the researchers actually took participants for walks in either natural or urban settings, those in the nature condition reported longer objective and subjective perceptions of elapsed time. Individuals in the nature condition also reported feeling more relaxed than those in the urban condition.

Fear

Of all the human emotions, fear is the most intensively examined in studies of time judgment, according to Sylvie Droit-Volet, a professor in developmental and cognitive psychology at Université Clermont Auvergne, France, and one of the most prolific researchers on emotions and time perception.

Indeed, neuroscientist and author David Eagleman famously showed a connection between fear and time illusions several years ago. Eagleman strapped chronometric devices to experiment participants’ wrists and sent them on a 15-story drop on an amusement park ride. When asked later, most individuals overestimated the duration of the fall.

Scientists hypothesize that threatening stimuli — the most innately disturbing forms of novelty — cause intense physiological reactions that distort our internal sense of the passage of time. In a study published in 2011, Droit-Volet and her colleagues had university students rate their moods both before and after showing them different video segments that induced a mood of fear, one of sadness, or a neutral emotion. In the “fear” session, the participants watched clips from horror movies including Scream and The Shining. In the “sad” session, they watched segments of heartrending dramas such as Philadelphia and City of Angels. And the “neutral” session involved informational videos (e.g., weather forecasts and stock market updates). As expected, the horror films induced feelings of fear among the students, while the dramas induced sadness and the neutral clips spurred minimal emotional effects.

In addition, just before and after viewing each set of video categories, the participants had to estimate the duration of a stimulus (blue dot). Droit-Volet and colleagues found distortion in time judgment after compared with before (baseline estimates) viewing the scary films, while no change in time judgment was observed after viewing the sad and neutral film clips. Under the influence of fear, participants judged the stimulus durations as longer. The results suggest that fear distorts our experience of time in order to be prepared to act as fast as possible in case of danger.

APS James McKeen Cattell Fellow Richard A. Bryant demonstrated this effect in the field 10 years ago when he and then-graduate student Leah A. Campbell conducted a study involving more than 60 people who went skydiving for the first time. Bryant and Campbell asked the participants to rate their levels of both fear and excitement as they prepared to embark. Thirty minutes after completing their 14,000-foot jump, the novices estimated, in minutes, the time that had elapsed from the moment they began putting on their skydiving gear to the moment they landed. Those who had rated themselves higher on the fear scale provided longer time estimates for the experience compared with those who scored high on excitement.

The Time Ahead

Increasingly, researchers are taking a closer look at the brain to better understand the relationship between emotion and time perception. Neurotransmitters such as dopamine and norepinephrine, which play roles in reward and threat responses, respectively, are drawing particular interest. The work holds significant promise for research into the symptoms of mental and motor disorders that have been linked to both abnormal dopamine levels and impaired time perception. And neuroimaging, when combined with emerging statistical techniques, may help uncover new insights into individual differences in subjective time experience, William J. Matthews of Cambridge University wrote with Meck in a 2014 article.

Other empirical pursuits are taking a longer view, focusing on how we experience passing months and years rather than the minutes that elapse during a car crash or a walk down the beach. The research also has important implications for our understanding of clinical conditions such as attention-deficit/hyperactivity and post-traumatic stress disorders, depression,
and schizophrenia, all of which are associated with erratic temporal awareness.

Time perception is even showing up as an outcome measure for other psychological phenomena, including social interactions. In a 2015 study, for example, psychological scientists led by APS Fellow Gordon B. Moskowitz of Lehigh University showed evidence that White people — particularly those who worry about appearing racist — perceive time as slower when observing faces of Black men. This could possibly explain a range of examples of implicit biases, such as doctors unintentionally spending less time with Black patients compared with White patients, they report in Psychological Science.

Discoveries about temporal illusions hold implications for a seemingly endless stream of life activities. Beneath individuals’ efforts to stay patient in jammed traffic, set aside quality time with family and friends, meet a deadline, or even give an accurate eyewitness report lie our personal estimates of the seconds and minutes ticking forward. o –Joe Dawson and Scott Sleek

References

HAVING FUN WHEN TIME FLIES

While many time-perception studies show how emotional cues can alter an individual’s estimate of time passed, some have taken an opposite approach and demonstrated how manipulating the clock itself can affect engagement and enjoyment.

In a set of experiments conducted nearly a decade ago, undergraduate participants were assigned to a variety of conditions in which they engaged in such tasks as:

- completing word puzzles;
- listening to short clips of annoying sounds;
- listening to and rating a song they chose from a list of 12 popular selections; and
- reading and then recalling details from fabricated scientific news articles related to time.

For each experiment, the psychological researchers led by Aaron M. Sackett at the University of St. Thomas in Minnesota manipulated external time cues (e.g., artificially accelerating or decelerating timers displayed on a computer screen). Sackett and his colleagues found that participants who reported feeling time passing unexpectedly quickly rated tasks as more engaging, noises as less irritating, and songs as more enjoyable compared with those cued to perceive time dragging.

Sackett and colleagues said the results suggest that “felt time distortion operates as a metacognitive cue that people implicitly attribute to their enjoyment of an experience (i.e., time flew, so the experience must have been fun).”

Reference:
How Psychological Science Can Influence Climate-Change Attitudes and Actions

By David G. Myers

Climate change has arrived. In 2017, atmospheric greenhouse gases, global temperatures, and sea levels all reached record or near-record highs, while winter Arctic sea ice hit a record low (Blunden, Arndt, & Hartfield, 2018). This global phenomenon is a weapon of mass destruction. Weird weather — scorching heat, hurricanes, floods — has always occurred, but extreme weather happenings are now “beyond the bounds of natural variability” (AMS, 2017; NAS, 2016a). Worldwide, such events have contributed to increasing insurance losses from natural catastrophes, with 2017 setting a record in the number of more-than-billion-dollar weather-related US disasters (III, 2017; NCDC, 2017). Global warming also makes heat waves, droughts, wildfires, hurricanes, and floods more intense (NAS, 2016b). To deny climate change is to deny reality.

Climate change also portends psychological consequences:

- *Displacement and trauma.* If this century’s predicted 2° to 4° Celsius increase occurs, we can expect drastic change that will force massive resettlement (de Sherbinin et al., 2011). Nathaniel Rich (2018) offers the prognosis:

  If by some miracle we are able to limit warming to two degrees, we will only have to negotiate the extinction of the world’s tropical reefs, sea-level rise of several meters and the abandonment of the Persian Gulf ... Three-degree warming is a prescription for short-term disaster: forests in the Arctic and the loss of most coastal cities ... Four
degrees: Europe in permanent drought; vast areas of China, India, and Bangladesh claimed by desert; Polynesia swallowed by the sea; the Colorado River thinned to a trickle; the American Southwest largely uninhabitable. When floods, drought, or wildfires force people to leave their homes and work, the common result is increased poverty and hunger, loss of cultural identity, and earlier death. For psychological health, climate matters in the following (and other) ways:

• **Conflict.** Much human misery—from financial recessions to wars—has arisen from climate fluctuations (Zhang et al., 2011). When climate changes, agriculture suffers and famine and epidemics increase, leading to increased domestic violence, ethnic aggression, land invasions, and civil conflicts (Hsiang, Burke, & Miguel, 2013). For social stability, climate matters.

• **Aggression.** In laboratory and field studies, heat amplifies short-term aggressive behavior. Hot days predict increased neighborhood aggressive behavior and baseball batters hit by pitchers. Hot seasons, years, and cities experience greater violence than their cooler counterparts (Anderson & Delisi, 2011; Van Lange, Rinderu, & Bushman, 2017). For relationships, climate matters.

Given that climate change arises from human behavior, Paul Van Lange, Jeff Joireman, and Manfred Milinski ask, *What can psychological science (and our teaching) offer?* Climate change, they note, pits self-interests against collective interests (a social conflict between the personal benefits and communal costs of, for example, one’s gas-slurping SUV), and short-term versus future interests (a temporal conflict between the immediate benefits of consumption and its consequences for future generations).

To respond to these social dilemmas, the authors ask, how can psychological science promote belief in climate change as well as an intergroup and longer-term perspective on the issue?

**Reversing climate skepticism.** How can we close the troubling gap between scientific and public acceptance of human-caused climate change—with 99.9% of 24,210 climate-science articles, but only 62% of the US public, acknowledging climate change (Powell, 2015; Saad, 2017)? One biasing influence on public understanding is people’s recent, local weather experiences. A winter blizzard, being cognitively available, dampens belief in global warming, which rises again with the advent of a blistering heat wave. To help students appreciate the distinction between local weather variations and global climate, a Stephen Colbert tweet might help:

![Stephen Colbert tweet](image)

Van Lange et al. also recommend persuading people with factual, concrete, locally relevant climate implications. Talk flooding risks to those in flood-prone and coastal areas and heat and agricultural risks to those in hotter climates. And we might add to persuade people by connecting with their values—discuss climate-change effects on the poor to Democrats and on national security to Republicans.

**Promoting intergroup cooperation.** Nations vary in their population density, wealth, and pollution. And nations (especially their competing representatives) often distrust one another. In addition to suggesting the seeking of superordinate, cooperative goals, Van Lange et al. encourage a competitive altruism, whereby cities or nations compete for prosocial reputations. Public rankings and “cleanest city” awards can harness intergroup competition for positive purposes.

During its recent water crisis, Cape Town, South Africa, put this reputational principle to work at an individual level with an online “City Water Map” that revealed (with a colored dot) whether individual households’ water usage was within the water-restriction limit. The effort aimed not to “name and shame,” but rather “to publicize households that are saving water and to motivate others to do the same” (Myers, 2018; Olivier, 2018).

**Transcending borders of time.** To promote long-term thinking, Van Lange et al. recommend focusing on the children who will live in the future climate (kinship fosters cooperation). Intergenerational fairness norms and the benefits of delayed gratification also can be invoked.

**For class discussion.** To prepare for discussion, students might be given a survey (ideally with anonymous Yes/No clicker responses) asking them what they understand about climate change. Is it happening? If so, are humans responsible?

Given the seriousness of climate change, students might then be asked to discuss, in small groups assigned aspects of the Van Lange article or as a class:

• Why does public opinion lag behind scientific understanding?

• How can people be helped to discount temporary, local weather—the cold day—when assessing global climate trends? Might there be useful metaphors or analogies (we judge a softball or baseball batter by batting average, not the last swing of the bat)?

• In addition to a “cleanest city award,” might there be other similar ways mayors or corporate CEOs could be persuaded by reputational concerns?

• How might we frame climate advocacy effectively—by describing the greenhouse effect as a “heat-trapping blanket” and a carbon tax as “carbon offsets”?

• How can we most effectively focus people’s concerns on their children’s and grandchildren’s future on the spaceship Earth? (Can such future concern be engaged for those without children?)
Individual Differences in Navigating

By Gil Einstein and Cindi May


Efficient navigation through our environments is critical for survival. Animals rely on navigational skills for obtaining food and water, avoiding predators, and finding shelter. For humans, taking the long route wastes time and getting lost can lead to dangerous outcomes.

How do we navigate our environments? Ever since Tolman’s (1948) classic research, many have argued that humans (and other animals) find their way by using cognitive maps. Cognitive maps are mental representations of environments that capture the spatial relations among locations. Thus, with a cognitive map, a person can find an efficient path between locations that have not been experienced directly. Others have argued that we do not form map-like representations of our environments and instead rely on less flexible, response-based strategies (e.g., to get from my house to the grocery store, I take the first right and then make a left at the coffee shop).

Which of these views is correct? According to Steven Weisberg and Nora Newcombe (2018), both. Specifically, they present strong evidence that some people form cognitive maps and others do not, and that those who do so are more successful at navigating their worlds.

Earlier methods of studying navigation skills involved driving people through unfamiliar neighborhoods and then testing their senses of direction. Weisberg and Newcombe describe a recent and more convenient technique that involves having participants learn locations and routes in a virtual town (e.g., Schinazi, Nardi, Newcombe, Shipley, & Epstein, 2013). Participants first travel along the roads of one part of the town and learn the names and locations of four buildings along that path.

They then travel through a different part of the town, learning the names and locations of four different buildings. Next, participants travel two routes that connect the two parts of town.

The interest in this research is the extent to which participants can (1) form a good spatial representation of each part of town and (2) spatially integrate the representations from each part of town into a holistic cognitive map. At test, participants are placed in front of one of the buildings and asked to point in the direction of a target building, which is sometimes located in that part of town and sometimes in a different part of town.

Researchers gauge the quality of participants’ cognitive maps by the discrepancy between the pointed direction and the actual direction in which the building is located.

Across a number of studies, Weisberg and Newcombe (2016) found substantial individual differences in the quality of participants’ representations. Some participants were integrators who formed good cognitive maps that accurately represented the entire town. Others were nonintegrators who had good spatial judgments within each part of town but not between the different parts of town. Still others were imprecise navigators who had poor spatial judgments even within each section of town. In other words, some people seem to form high-quality cognitive maps, whereas others have great difficulty spatially representing the routes and locations within their environments.

Performance on this virtual-world task seems to capture real-world navigation skills. Poor performance on this task is strongly correlated with high ratings on items from the Santa Barbara Sense-of-Direction Scale (Hegarty, Richardson, Montello, Lovelace, & Subbash, 2002), such as “I very easily get lost in a new city” and “I have trouble understanding directions” (Weisberg, Schinazi, Newcombe, Shipley, & Epstein, 2014).

To help students appreciate individual differences in the ability to form cognitive maps, try the following demonstration. Prepare by getting a map of your campus and identifying a few buildings that students are likely to travel to directly from your classroom as well as a few more remote buildings from different parts of campus. In class, ask students to close their eyes, then give them the name of a building and ask them to point in its direction. Then have students open their eyes and compare their pointed direction with those of their classmates and to the actual direction on a map that you project to the class. Try this with all of the buildings. This demonstration should reveal substantial individual differences. Whereas integrators should have good spatial representation for all locations, nonintegrators should have difficulty with the more remote locations, and imprecise navigators should struggle with all locations.

APS Fellow Cindi May is a professor of psychology at the College of Charleston. Her research explores ways to enhance memory and cognitive functioning for older adults and individuals with intellectual disabilities. May can be contacted at mayc@cofc.edu.

APS Fellow Gil Einstein is the William R. Kenan, Jr., Professor of Psychology at Furman University. His research examines processes involved in prospective memory retrieval and how these are affected by aging. In 2014, he received the APS Mentor Award. Einstein can be contacted at gil.einstein@furman.edu.
might ask students to indicate whether they would identify themselves as integrators, nonintegrators, or imprecise navigators. You might also ask them to report whether they relied on a cognitive map or some other strategy for their judgments.

For discussion, you can ask students to consider variables that are correlated with navigation abilities. Navigation skills are not highly related to general intelligence, but integrators outperform imprecise navigators on perspective taking (the ability to imagine different orientations in a scene from different perspectives; Hegarty & Waller, 2004), mental rotation (the ability to mentally rotate three-dimensional objects), and verbal and spatial working memory (the ability to hold items or locations in mind in the face of distraction). These basic processes may underlie the ability to form accurate cognitive maps of complex environments.

Professors might also ask students to think about whether the widespread use of GPS systems such as Google Maps affects our ability or willingness to form cognitive maps (Ishikawa, Fujiwara, Imai, & Okabe, 2008). You could also query your students to determine whether there are individual differences in how they use navigation apps. Imprecise navigators may simply rely on step-by-step directions, whereas integrators may first zoom out in an effort to form a cognitive map of their path. In a few years, driverless cars will take us to our destinations. In the future, will we all be imprecise navigators?

References
Testing for Measurement Invariance

Does Your Measure Mean the Same Thing for Different Participants?

By Sean T. H. Lee

From Beck’s Depression Inventory to the Positive and Negative Affect Schedule (PANAS), psychologists regularly use scales, schedules, and inventories in published empirical papers. But how can we be certain that these questionnaires actually measure the same construct across all respondents?

Take shame and guilt, two indicators of negative affect on the PANAS. They are generally considered negative emotions in individualistic cultures. But in collectivistic cultures, shame and guilt are seen somewhat positively; they represent self-reflection and self-improvement rather than sheer wrongfulness (Eid & Diener, 2001; Mesquita & Leu, 2007). Such equivalence issues eventually prompted the development of an international version of the PANAS that excludes items carrying different meanings across cultures (Thompson, 2007). Still, the original PANAS, which doesn’t account for those variations, is still commonly used (Chan, 2007; Spencer-Rodgers, Peng, & Wang, 2010).

While many well-established measures have already withstood rigorous tests of measurement invariance and are normed across age (Bowden, Weiss, Holdnack, & Lloyd, 2006), gender (Byrne, Baron, & Campbell, 1993) and culture (Runyan, Ge, Dong, & Swinney, 2012), they are merely a few of the ever-growing number of scales that are being developed and used in psychological research. It’s important for scientists to understand the basic tenets of measurement invariance testing to produce more comprehensive, broadly applicable results in research and practice.

Measurement Invariance Testing: Multigroup Confirmatory Factor Analysis

To test measurement invariance across participants from various groups, researchers use a statistical technique called “multigroup confirmatory factory analysis” (CFA; Milfont & Fischer, 2015). Essentially, multigroup CFA is an extension of the typical CFA; however, instead of fitting a single model to your data set, you divide the data set into groups (e.g., young adult, middle-aged adult, and older adult), determine model fit for each group separately, and then make multi-group comparisons. This procedure allows researchers to examine whether respondents from different groups interpret the same measure in a conceptually similar way (Bialosiewicz, Murphy, & Berry, 2013).

The three typical phases of measurement invariance testing are as follows.

Configural Invariance

Using age as an example, a configural invariance test allows you to examine whether the overall factor structure stipulated by your measure fits well for all age groups in your sample. As with a typical CFA, you start by specifying the relationships between each item in the measure you’re using and the latent factor(s) that the items are stipulated to measure. Take, for example, the five-item Satisfaction with Life Scale (Diener, Emmons, Larsen & Griffin, 1985). The latent construct of “life satisfaction” is indicated by each of the five scale items (e.g., “in most ways, my life is close to ideal”). The strength of each scale item-latent factor relationship is termed “factor loading” and each item’s origin value is termed “item intercept” (similar to the concepts of beta-coefficient and y-intercept, respectively, in linear regression analysis). To test configural invariance, you fit the model you have specified onto each of the age groups, leaving all factor loadings and item intercepts free to vary for each group. You then compare model fit across all age groups — a good multi-group model fit suggests that the overall factor structure holds up similarly for all ages.

Metric Invariance

The next step is to test for metric invariance to examine whether the factor loadings are equivalent across the groups. This time, you constrain the factor loadings to be equivalent across groups, while still allowing the item intercepts to vary freely as before. A good multi-group model fit indicates metric invariance — if constraining the factor loadings in this way results in a poorer fit, it suggests that the factor loadings are not similar across age groups.

Ascertaining metric invariance allows you to substantiate multi-group comparisons of factor variances and covariances, since metric invariance indicates that each item of the scale loads onto the specified latent factor in a similar manner and with similar magnitude across groups. As such, you can assume that
differences in factor variances and covariances are not attributable to age-based differences in the properties of the scales themselves.

Scalar Invariance

The final step is to test for scalar invariance to examine whether the item intercepts are equivalent across groups. In this case, you constrain the item intercepts to be equivalent, just as you did with the factor loadings in the previous step. If this results in a poorer multi-group model fit, you can conclude that the item intercepts are not similar for people of different ages.

Ascertaining scalar invariance allows you to substantiate multi-group comparisons of factor means (e.g., t-tests or ANOVA), and you can be confident that any statistically significant differences in group means are not due to differences in scale properties at different ages.

These steps are necessarily sequential, and scientists typically stop testing when any of these steps produces evidence of noninvariance. Scientists would then examine the factor loadings and item intercepts on an item-by-item basis to determine which items are the main contributors toward measurement noninvariance. Although additional steps can offer an even stricter test of measurement invariance, researchers generally agree that assessing configural, metric, and scalar invariance is sufficient for establishing measurement invariance (Bialosiewicz et al., 2013; Milfont & Fischer, 2015).

Testing for measurement invariance plays an integral role in psychological research, ensuring that comparisons across various groups of participants are both meaningful and valid. Chan (2011) states that “we cannot assume the same construct is being assessed across groups by the same measure” without tests of measurement invariance (p. 108). Measurement invariance testing is, therefore, a critical addition to our arsenal of statistical procedures that help to increase the robustness and validity of our research, regardless of field or discipline.

References


“Football has serious cognitive risks, but there’s still a lot to learn about the extent of them and ways they can be mitigated. The ability to assist with the latest research being done on brain trauma and the pursuit to better understand CTE. To study it not just from the perspective of a psychologist or a clinician, but also as a person who has played for several years at the highest level, is something that excites me.”

-NFL tight end Julian Thomas on his decision to pursue a PhD in psychology. He shared his career goal in an essay published in The Players Tribune, a media company that enables athletes to connect directly with fans.
Jeremy Biesanz, University of British Columbia, Canada, BBC, July 30, 2018: Are First Impressions Really Accurate?

Erin Bowen, Embry-Riddle Aeronautical University, Wiki Education, July 23, 2018: Science Experts Learn How to Bring Their Knowledge to Wikipedia.

Nyla Branscombe, University of Kansas, Vox, July 31, 2018: White Threat in a Browning America.


Edward Deci, University of Rochester, The Washington Post, August 13, 2018: How to Motivate Older Kids Without Using Rewards, Punishment or Fear. (No, Really.)


Judy Garber, Vanderbilt University, NPR, August 12, 2018: Treating Teen Depression Might Improve Mental Health of Parents, Too.


Chris Koch, George Fox University, Wiki Education, July 23, 2018: Science Experts Learn How to Bring Their Knowledge to Wikipedia.


Psychological Science Hits the Professional Poker Circuit

Building on her studies on overconfidence and risky decision-making with APS Past President Walter Mischel, Maria Konnikova turned research for her new book into a yearlong sabbatical to play on the professional poker circuit. After winning more than $200,000 in tournament jackpots, Konnikova has experienced firsthand how the unpredictable environment of the poker table challenges players’ self-control.

August 10, 2018


Maureen Craig, New York University, Vox, July 31, 2018: White Threat in a Browning America.

MEMBERS in the news

The Cognitive Bias Draining Your Bank Account

Retirement planning is about more than just income. According to research by Hal Hershfield at the University of California, Los Angeles, people are often so “estranged” from their future selves that “saving is like a choice between spending money today or giving it to a stranger years from now.” In one study, however, students who were shown a virtual-reality avatar of what they might look like at 70 put twice as much money into a hypothetical retirement account, suggesting that there may be a way to strengthen the relationship between our present and future selves.

The Atlantic

September 2018


Beth Venzke, Concordia University Chicago, Wiki Education, July 23, 2018: Science Experts Learn How to Bring Their Knowledge to Wikipedia.

The Atlantic

Treating Depression in Teens Can Enlighten the Whole Family

Research suggesting a link between depression in kids and their parents serves as an important reminder for adults to take their mental health seriously as well, says APS Fellow Judy Garber. It can be hard for a parent to see their child struggling, and the data show that treatment can have benefits for the entire family.

The Atlantic

August 12, 2018

Keith Payne, University of North Carolina at Chapel Hill, Behavioral Scientist, July 3, 2018: Try to Resist Misinterpreting the Marshmallow Test.

Mark Reinecke, Northwestern University, NPR, August 12, 2018: Treating Teen Depression Might Improve Mental Health of Parents, Too.

Jennifer Richeson, Yale University, Vox, July 31, 2018: White Threat in a Browning America.

Richard Ryan, Australian Catholic University, The Washington Post, August 13, 2018: How to Motivate Older Kids Without Using Rewards, Punishment or Fear. (No, Really.)

More APS Members in the news online at www.psychologicalscience.org/MembersInTheNews

Podcast included in coverage

Video included in coverage

ICPS Speaker

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The National Institute on the Teaching of Psychology is designed for teachers of psychology who are interested in:

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CONNECTICUT

Fairfield University
Industrial/Organizational Psychology
Non-Tenure-Track Assistant or Associate Professor
The Department of Psychology in the College of Arts & Sciences at Fairfield University invites applications for a Non-Tenure-Track Assistant or Associate Professor position in Industrial/Organizational Psychology beginning Fall 2019. Applicants must have a strong commitment to excellence in graduate teaching, including a commitment to innovation and demonstrated excellence in using technology in the classroom. Requirements: Applicants are expected to have a Ph.D. in Industrial/Organizational Psychology or a related field. The teaching load is three graduate courses each semester. The Assistant or Associate Professor will also be responsible for the administrative components of the I/O Master’s Program, including admissions, student internship coordination, and overseeing review and revision of the program. Graduate courses taught would include Introduction to I/O Psychology, Organizational Development, Effective Interviewing, and Consulting Theory & Practice, as well as courses in the candidate’s area of specialization. Opportunities also exist for teaching undergraduate psychology courses. Additional Information: The psychology department consists of 10 full-time faculty representing a range of specialties and is housed in a spacious, well-equipped facility in the Bannow Science Center. There is a vibrant culture of student–faculty research. The department offers a robust internship program, a Psychology Club, and chapters of Sigma Xi and Psi Chi. The salary and the benefits for the position are competitive. Fairfield University is an Equal Opportunity/Affirmative Action employer, committed to excellence through diversity, and, in this spirit, particularly welcomes applications from women, persons of color, and members of other historically underrepresented groups. The university will provide reasonable accommodations to all qualified individuals with a disability. Application Instructions: Review of applications will begin immediately; for full consideration all material must be submitted by October 12, 2018. For full consideration, please visit https://ffd.wd1.myworkdayjobs.com/en-US/EmploymentOpportunities/job/Fairfield-CT/Non-Tenure-Track-Assistant-or-Associate-Professor--Industrial-Organizational-Psychology_JR0000113 and upload the following materials: 1) a curriculum vitae 2) a letter of application 3) a statement of teaching philosophy 4) examples of syllabi and teaching evaluations if available 5) representative reprints of scholarly work if available 6) unofficial graduate transcript 7) contact information for three references.

Fairfield University
Department of Psychology
Tenure-Track Assistant Professor in Cognitive Neuroscience
The Department of Psychology in the College of Arts & Sciences at Fairfield University invites applications for a tenure-track Assistant Professor position in Cognitive Neuroscience beginning Fall 2019. Applicants must have a strong commitment to excellence in undergraduate teaching, including a commitment to innovation and demonstrated excellence in using technology in the classroom. The potential for developing an active research program in the candidate’s area of specialization is also required. Requirements: Applicants are expected to have completed a Ph.D. in Cognitive Neuroscience or a related field, but ABD candidates who expect their degree by Fall 2019 will also be considered.

The teaching load is three undergraduate courses each semester. Courses taught would include Behavioral Neuroscience, Cognitive Neuroscience, and Psychological Statistics, as well as courses in the candidate’s area of specialization. Preference will be given to candidates who are able to teach additional courses such as Cognitive Psychology, Learning, Sensation/Perception, Research Methods, and/or General Psychology. Additional Information: The department consists of 10 full-time faculty representing a range of specialties and is housed in a spacious, well-equipped facility in the Bannow Science Center. There is a vibrant culture of undergraduate student–faculty research and a growing institutional emphasis on the health sciences. Faculty routinely present at
Tufts University

Department of Psychology

Assistant Professor (Tenure Track)

The Department of Psychology at Tufts University is seeking applicants at the assistant professor level for a tenure-track position in computational clinical neuroscience to begin September 1, 2019. The successful candidate will have a PhD (or be ABD) and an active research program capable of supporting extramural funding. Area of specialization is open, but candidates should use mathematical and computational modeling approaches (e.g., Bayesian, connectionist, reinforcement learning) and/or data science approaches in their research; candidates with research interests that bridge to those of other members of the department are of particular interest. Potential research areas might include, but are not limited to, characterizing core computational and/or neural network disruptions underlying psychological disorders; identifying neural markers that predict mental health problems and/or treatment response; testing predictions developed from computational models of basic perceptual, cognitive, or affective mechanisms in clinical populations; and applying advanced analytic approaches (e.g., multivariate analysis, machine learning) to complex neuroimaging datasets (including fMRI, EEG/ERP, and MEG). The successful candidate will utilize methods and ask questions that can contribute to the university’s new Data Intensive Studies Center (or DISC, see http://viceprovost.tufts.edu/data-intensive-study-center/). Applicants should be interested in teaching introductory, advanced, and quantitatively-oriented courses that will contribute to our undergraduate majors in Biopsychology, Clinical Psychology, and Cognitive & Brain Sciences; to our PhD graduate programs in Experimental Psychology and Cognitive Science; and to the new degree programs within the DISC. Teaching load would be four courses per year or the equivalent, with opportunities for workload-related reductions. Applicants should submit via Interfolio (https://apply.interfolio.com/51438) the following materials: a one-page cover letter discussing their potential contributions to the department and to the DISC initiative at Tufts; a C.V.; a statement of research accomplishments and future plans (note that our department embraces open and reproducible science, and candidates are encouraged to address how they pursue these goals in their work); a statement of teaching experience and approach; three letters of recommendation which should be uploaded by recommenders directly to the Interfolio site; copies of representative scholarly work (no more than three); and a brief diversity statement that describes the candidate’s aspirations and potential for promoting diversity and inclusion in their professional career. Inquiries should be emailed to Department Manager Jessica Storozuk (Jessica.Storozuk@tufts.edu). Review of applications will begin October 1, 2018, and will continue until the position is filled. Tufts University, founded in 1852, prioritizes quality teaching, highly competitive basic and applied research, and a commitment to active citizenship locally, regionally, and globally. Tufts University also prides itself on creating a diverse, equitable, and inclusive community. Current and prospective employees of the university are expected to have and continuously develop skill in, and disposition for, positively engaging with a diverse population of faculty, staff, and students. Tufts University is an Equal Opportunity/Affirmative Action Employer. We are committed to increasing the diversity of our faculty and staff and fostering their success when hired. Members of underrepresented groups are welcome and strongly encouraged to apply. If you are an applicant with a disability who is unable to use our online tools to search and apply for jobs, please contact us by calling Johny Laine in the Office of Equal Opportunity (OEO) at 617-627-3208 or at johny.laine@tufts.edu. Applicants can learn more about requesting reasonable accommodations at http://oee.tufts.edu.

Washington University in St. Louis

Department of Psychological & Brain Sciences

Assistant Professor

The Washington University in St. Louis Department of Psychological & Brain Sciences is seeking candidates for a tenure-track Assistant Professor position in the area of Brain, Behavior, and Cognition. All areas of Brain, Behavior, and Cognition will be considered. We are a highly collaborative department and are especially interested in candidates whose research programs connect to other areas of current strength or emerging focus at Washington University, including cognitive aging, healthy and disordered cognition, development, neuroimaging, computational modeling, and data science. The individual in this position will conduct research, publish in peer-reviewed journals, advise students, teach psychology or related courses, and participate in department governance and university service. The primary qualifications for this position are demonstrated excellence in empirical research and teaching; a PhD in psychology or another directly relevant field is required. We especially and strongly encourage applications from women and members of minority groups. Send curriculum vitae, reprints, a short statement of research interests, and teaching experience to our website at https://jobs.wustl.edu and apply to job posting number 40761. Also arrange for three letters of reference to be emailed to: Cheri B. Casanova at cbcasanow@wustl.edu. The Search Committee will begin the formal review process as early as September 15, 2018, but applications will be accepted until the search is concluded. Washington University in St. Louis is committed to the principles and practices of equal employment opportunity. It is the University's policy to recruit, hire, train, and promote persons in all job titles without regard to race, color, age, religion, sex, sexual orientation, gender identity or expression, national origin, protected veteran status, disability, or genetic information.
The Department of Psychology at the University of Tennessee, Knoxville, invites applications for a tenure-track Assistant Professor position in Social Psychology. We invite applications from individuals with expertise in any domain relevant to social psychology. This position will begin in August 2019. The Department comprises 32 tenure-track faculty in three PhD programs (Clinical, Counseling, and Experimental). The position is in the Experimental Program, which comprises the Biological, Developmental, and Social areas. Information about the Department and Social Area is online at http://psychology.utk.edu. Candidates must have received a PhD and should have a strong research record, enthusiasm for teaching at the graduate and undergraduate levels, and potential for extramural funding. Applications should electronically submit their vita, research statement, representative publications, teaching statement, and three letters of recommendation to Ms. Connie Ogle at cjogle@utk.edu (please state “Social Psychology Search Committee” in the subject line). Review of applications will begin immediately and will continue until the position is filled. The Knoxville campus of the University of Tennessee is seeking candidates who have the ability to contribute in meaningful ways to the diversity and intercultural goals of the University. Women and minorities are especially encouraged to apply. The University of Tennessee is located within easy driving distance to Asheville, Nashville, Atlanta, and the Great Smoky Mountains. The city of Knoxville is a hidden gem with a beautiful and walkable downtown, varied nightlife, active neighborhoods, and eclectic shopping and restaurants. The University of Tennessee is an EEO/AA/Title VI/Title IX/Section 504/ADA/ADEA institution in the provision of its education and employment programs and services. All qualified applicants will receive equal consideration for employment without regard to race, color, national origin, religion, sex, pregnancy, marital status, sexual orientation, gender identity, age, physical or mental disability, or covered veteran status.

The Department of Psychological and Brain Sciences (liberalarts.tamu.edu/psychology/) at Texas A&M University invites applications for a tenured faculty position in clinical psychology. The position will be at the rank of Associate Professor or Professor, with an anticipated start date of Fall, 2019. We are interested in scholars conducting research in any area related to clinical psychology, and value innovation and excellence in methodological, quantitative, and computational approaches. This position will complement a world-class core of clinical researchers, many of whom participate in cross-cutting research concentrations in affective science, diversity science, and personality processes. Applicants should have an outstanding record of research achievement, evidence of extramural research funding, and a strong commitment to undergraduate and graduate education. The successful candidate will contribute to our clinical Ph.D. program, which is APA-accredited and a member of PCSAS, and would teach undergraduate and graduate courses in their area of expertise. Preference will be given to individuals interested in serving as Director of Clinical Training, and leading efforts to strengthen and grow the program. A Ph.D. in psychology or a closely related field is required. To apply, please email a letter of intent, curriculum vitae, statements on research and teaching, and 3 sample research publications to clinicalpsyc@tamu.edu. You will also need to complete an application at https://tamus.wd1.myworkdayjobs.com/TAMU_External (search for “professor psychology”). INTERNAL APPLICANTS: If you currently ARE a Texas A&M System employee: Go to Internal Career Site – https://jobs.tamu.edu/internal-applicants/. For more detailed information https://liberalarts.tamu.edu/psychology/2018/08/28/tenured-faculty-position-available-in-clinical-psychology/. The search committee will begin reviewing applications October 15, 2018 and will continue to review new applications until the position is filled.

Federal Research, Funding, and Policy
Read the latest announcements and updates about federal research and funding for psychological science.
www.psychologicalscience.org/policy
GRANTS

CASBS Accepting Applications for Residential Fellowships

The Center for Advanced Study in the Behavioral Sciences (CASBS) at Stanford University is now accepting applications for residential fellowships for the 2019–2020 academic year. Online applications will be accepted at the Center’s website through November 2, 2018. For more information, guidelines, and application requirements, visit https://casbs.stanford.edu/fellowships. The Center brings together deep thinkers from diverse disciplines and communities to advance understanding of the full range of human beliefs, behaviors, interactions, and institutions. A leading incubator of human-centered knowledge, CASBS facilitates collaborations across academia, policy, industry, civil society, and government to collectively design a better future. CASBS has hosted generations of scholars, thinkers, and researchers who come for a year as fellows. A CASBS fellowship is considered a career milestone by most recipients, and almost all report that the year had a transformative effect on their work. Former fellows include Nobel laureates, Pulitzer Prize winners, winners of MacArthur Genius Awards, and hundreds of members of the National Academies. Fellows play key roles in starting new fields, policy thinking, research programs, and generative thinking that affirms policies and practice. See the CASBS website to review our activities and our most current research.

NIH Funding Announcements for Methodology Research

The National Institutes of Health (NIH) has released a new funding opportunity announcement designed to support research on methodology and measurement in the behavioral and social sciences. NIH is supporting research on methodology and measurement via the R21 grant mechanism, which is a 2-year grant for exploratory or developmental research providing up to $275,000 in direct support. Applicants are encouraged to propose research projects that address methodological issues related to: interdisciplinary, multimethod, and multilevel approaches that integrate with biomedical, physical, or computational science research; integrating, mining, and modeling data in combination with genetic, epigenetic, biomarker, and imaging data, research in and on diverse populations, the study of sensitive health-related behaviors in the context of healthcare, the social environment, and policy; and ethics in research. NIH encourages applicants to contact one of the many NIH Institutes and Centers participating in the funding announcement that matches the research focus of the proposed project before applying for funding. The participating Institutes and Centers are: Office of Behavioral and Social Sciences Research, National Cancer Institute, National Eye Institute, National Institute on Aging, National Institute on Alcohol Abuse and Alcoholism, National Institute on Deafness and Other Communication Disorders, and the National Center for Complementary and Integrative Health. Applications are due October 16, 2018.

NIH Funding for High-Priority Behavioral and Social Research Networks

The National Institute on Aging (NIA) has released two new funding announcements encouraging submission of proposals to develop research networks dedicated to behavioral research connected to aging, Alzheimer’s disease, and Alzheimer’s disease related dementias. Applications are limited to scientists wishing to develop networks in high-priority areas including midlife reversibility of biobehavioral risk associated with early life adversity, stress measurement, reproducibility in the social and behavioral sciences, life course health disparities at older ages, genomics and social sciences, integrating animal models to inform behavioral research on aging, rural aging, Alzheimer’s disease care and services research, and coordination of international studies conducting the harmonized cognitive assessment protocol.

Successful applicants will receive up to 5 years of funding and a budget of up to $250,000 per year. Interested applicants should submit a letter of intent by January 1, 2019 and applications are due by February 1, 2019.

MEETINGS

41st Annual National Institute on the Teaching of Psychology
January 3–6, 2019
St. Pete Beach, Florida, USA
nitop.org

3rd International Convention of Psychological Science
7–9 March 2019
Paris, France
icps2019.org

31st APS Annual Convention
May 23–26, 2019
Washington, DC, USA
psychologicalscience.org/convention

13th Biennial SARMAC Meeting
June 6–9, 2019
Brewster, Cape Cod, Massachusetts, USA
www.sarmac.org
In recent work, you’ve found that “identity flexibility” has potential benefits. Can you tell us about that?
In a paper coauthored with Jessica Remedios, Diana Sanchez, and Samuel Sommers, we show that simply reminding multiracial individuals (those with parents from different racial or ethnic backgrounds) about their multiple racial identities leads to increased problem-solving abilities associated with more creativity. And we see a very similar effect for monoracial individuals (those whose parents are the same racial/ethnic background) when we remind them about their multiple social identities, such as being a student, a female, and a friend.

More recently, in collaboration with Katherine Kinzler and Samantha Fan, we have replicated these effects in 6- to 7-year-old children. We found that asking them to consider their own multiple identities compared with thinking about the identities of others also boosts their creative thinking and increases how flexibly they see social categories.

To date, most psychology identity work has used singular identity frameworks, but it is obvious that we all have multiple identities (gender, race, age, sexual orientation, career, hobbies, etc.) … I argue we all have the potential to think more flexibly when thinking outside of our fixed social boxes. Some groups may just have more practice or experience with this perspective.

How does the college environment shape our thinking about diversity and identity?
My graduate work at Tufts University showed that White students living with an other-race roommate tend to have a more diverse friend network, positive shifts in their racial identity, and less stressful future interracial interactions at the end of their first year of college.

At Duke, I am in the process of trying to replicate these findings, but will also be looking at these outcomes for different types of minority students inclusive of race, religion, and sexual orientation … The college dormitory and campus are largely underutilized research contexts reflective of many types of cross-group contact. Combined with the fact that the first year of college in particular marks a very important identity transition period for young adults, I am excited to continue studying how the college environment may shift attitudes and behavior.

You’ve mentioned that you’re a “me-searcher” — how does this influence your research process?
Growing up as a biracial Black/White individual who outwardly looks White has made me hyper aware about the role that one’s visible versus invisible identities play in shaping our own behavior and how we may be perceived by others. Seeing firsthand how differently my White mother and my Black father — and even my more racially ambiguous biracial brother — are treated has directly influenced my interests in cross-group interactions, racial ambiguity, and identity denial experiences.

Being biracial and growing up in a mixed-race family, combined with the fact that I have lived in northern and southern California, Boston, and Chicago, and now Durham, has shown me how malleable and flexible one’s own identities and perceptions of those identities are in US society.

You are a psychological scientist, a university professor, a mentor — what other identities are important to you?
As I have said, acknowledging our multiple identities is something we all should be doing! So in addition to being a scientist, professor, and mentor, some of my other important identities are being: a biracial person, a female, a daughter, a sister, a wife, a friend, and an advocate. I also strongly identify as a foodie! ☺
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