Update on *AMPPS*, APS's New Journal

# Observer

Vol. 30, No. 10 • December 2017

## THE HIDDEN COSTS OF SLEEP DEFICITS

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# NEW APS JOURNAL

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# FEATURED SPEAKERS

***Fred Kavli Keynote Address***

## LYNN NADEL

*The University of Arizona*

### Making and Remaking Memory: Past, Present and Future

Lynn Nadel's scientific exploration of the hippocampus has led to groundbreaking developments in understanding how space and memory are represented in the brain. He coauthored the seminal book *The Hippocampus as a Cognitive Map* with John O'Keefe. Together, they received the 2006 Grawemeyer Award.

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***Presidential Symposium***

### Memory: From Neurons to Nations

APS President Suparna Rajaram brings together four distinguished psychological scientists to speak about the nature of memory from a variety of perspectives that include cognitive, neuroscientific, cultural, and developmental approaches for this year's Presidential Symposium.

**SUPARNA RAJARAM (Chair)**
*Stony Brook University, The State University of New York*

**DORTHE BERNTSEN**
*Aarhus University, Denmark*

**CHARAN RANGANATH**
*University of California, Davis*

**QI WANG**
*Cornell University*

**HENRY L. ROEDIGER, III**
*Washington University in St. Louis*

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***Bring the Family Address***

### The Paradox of Diversity: Promise, Pitfalls, and Implications for Racial Progress

## JENNIFER RICHESON

*Yale University*

Jennifer Richeson will deliver the 2018 Bring the Family Address. She has received numerous honors and awards for her research focusing on the social psychological phenomena of cultural diversity and social group membership. A Guggenheim Fellow and a MacArthur Genius Fellow, Richeson has used a broad range of empirical methods to examine the potential cognitive "costs" and mutual misperceptions associated with intergroup interactions.

# Observer

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| PUBLISHER | Sarah Brookhart |
| EDITOR | Scott Sleek |
| ASSISTANT MANAGING EDITOR | Mariko Hewer |
| EDITORIAL ASSISTANT | Kim Armstrong |
| SENIOR GRAPHIC DESIGNER | Candy Ferguson |
| GRAPHIC DESIGNER | Navaré Carter |





**Association for Psychological Science**
+1 202.293.9300; Fax: +1 202.293.9350
**apsobserver@psychologicalscience.org**
www.psychologicalscience.org/observer



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Observer
December 2017 Volume 30, Number 10

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Psychology researchers are exploring how ties between sleep and cognition affect central aspects of our societal fabric, including fairness, justice, relationships, and morality.



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In a special Q&A feature for her Presidential Column, APS President **Suparna Rajaram** talks with APS Fellow **Lynn Nadel** about his journey to an illustrious career studying the brain and memory.



### Powerful Tools for Designing Powerful Studies

A group of University of Notre Dame scientists has developed open-source tools to help researchers more precisely estimate effect sizes.



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*Advances in Methods and Practices in Psychological Science*, APS's newest journal, will be accessible to readers from all areas of science, not just methodologists and statisticians, says Editor **Daniel J. Simons**.

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"How to Give a Gift: Shock and Awe or Calm and Useful" by **C. Nathan DeWall**

"Corralling the Drifting Mind" by **Gil Einstein** and **Cindi May**

# An Unwavering Commitment to Science

## *Lynn Nadel's International Path to an Illustrious Career*

Lynn Nadel
*The University of Arizona*

*APS Fellow Lynn Nadel's scientific exploration of the hippocampus has led to groundbreaking developments in understanding how space and memory are represented in the brain. He coauthored the seminal book* The Hippocampus as a Cognitive Map *with John O'Keefe. Together, they received the 2006 Grawemeyer Award to honor their outstanding ideas in psychology that have had broad impact. I am delighted that Lynn Nadel will deliver the Fred Kavli Keynote Address on May 24, 2018, at the 30th APS Annual Convention in San Francisco.*

*To give students and young researchers a flavor for the professional path that one takes in building a career in psychological science, I asked Lynn — the Regent's Professor of Psychology at the University of Arizona — about his journey through the science of spatial memory. It is both instructive and inspiring to learn that Lynn's path to his outstanding career and scientific contributions has not always been straightforward, but his commitment to science has never wavered. -APS President Suparna Rajaram*

***What piqued your interest in the general area of your research?***

As a graduate student in Donald Hebb's Psychology Department at McGill University in the 1960s, and interacting on a regular basis with Peter and Brenda Milner, it was impossible not to be interested in memory and in how the brain did it — with a particular focus on the hippocampus, of course.

***Can you share with us a little about your educational path, and whether/how it led you to pursue research in psychological science?***

I went to Stuyvesant High School in New York, then to McGill as an undergraduate student because it had a great chemistry program (my interest in which lasted less than a semester). Taking Hebb's Introductory Psychology course was all I needed to jump head first into biological science in general and psychology in particular.

***Did you take any detours along the journey to where you are today, and if so, how would you describe the significance of these markers?***

More detours than direct paths, at least at the outset. My first tenure-track position was at the University of Arizona in 1985, 18 years after I got my PhD. In between, I spent 10 years in Europe (Prague, London, Bergen), then some time at the University of California, San Diego, the University of California, Irvine, and Dalhousie University in Nova Scotia. All this change was both invigorating and time-consuming.

***What have been the most exciting parts of your scientific career?***

The 6 years I spent at University College London on the academic staff in the Department of Anatomy, working with my friend from graduate school and now colleague John O'Keefe on the development of the cognitive map theory of hippocampal function, was a period of intense intellectual excitement and a fantastic match between two minds. Nothing is more fun than that kind of collaboration. I had a similar experience with Morris Moscovitch while he was on sabbatical in Arizona for a year.

***Did you face any obstacles in pursuing your scientific projects?***

Not having a real job was definitely an obstacle on occasion. Having five kids was not exactly an obstacle, but it certainly demanded lots of my time, especially as I was a single father for a good number of years.

**PRESIDENTIAL** continued on Page 7

40TH ANNUAL

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## Program Highlights

**Michelle (Mikki) Hebl:** Mindbugs and Gorillas and White Bears, Oh My!

**Simine Vazire:** Teaching Psychology during the Replicability Crisis

**Michael Gazzaniga:** The Consciousness Instinct

**Denise Park:** Fragile Minds: Predicting Who Will Age Well

**Antonio Puente:** 125 Years of Teaching of Psychology: Lessons, Challenges, and Trajectories

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**PRESIDENTIAL** continued from Page 5

***How have you balanced research demands with teaching and administrative responsibilities?***

Not very well. When I look back at my CV during the years I was department head at Arizona, I can see that I paid a price in personal productivity. But I got great satisfaction out of helping to build a strong department with wonderful colleagues and doing things to help them succeed. I'm now Chair of the Faculty at Arizona, a very demanding position, and it's a good thing it has come at what is certainly the end stage of my academic career.

***What/who have been major influences in your academic career?***

Donald O. Hebb, Dalbir Bindra, Peter and Brenda Milner, Jan Bures, Olga Buresova, John O'Keefe, Morris Moscovitch, Pat Wall, JZ Young, and E.C. Tolman.

***What's been your guiding compass in your academic career?***

Ask big questions, be flexible, stay curious, and work with smart people.

***What advice do you have for handling rejections from journals?***

Go home, have whatever you have to relax. Eat a good meal, go see a stimulating movie. Then revise the paper and submit it somewhere else.

***What advice, in general, would you give budding scientists around the world?***

Make communicating what you do to the public a central part of your training and your approach to science as you begin and continue your careers. ●

# *IT'S TIME!*

## Renew Your Commitment to Psychological Science with Your APS Membership

**Your APS membership supports a collective effort to advance psychological science across all areas**. We promote scientific exchange, increase public understanding of our field, and foster innovation in research methodology and practice. Together, we can transform society for the better. Here are a few ways we do that:

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# Interdisciplinarity and Integration: How Far and Wide?

Jason Finley is to be commended for his succinct statement of the potential value to psychology of knowledge and understanding grounded in the humanities ("Bridging Psychological Science and the Humanities," *Observer*, October 2017). What would be even more gratifying is if we would recognize and celebrate how such a perspective was astutely analyzed, several decades ago and in characteristically cogent and colorful style, by APS Fellow Sigmund Koch. This summary statement of his vision of "The Psychological Studies" should serve as further invitation to consider both its intellectual and institutional implications.

*I have argued that psychology has been misconceived, whether as science or any kind of coherent discipline devoted to the empirical study of man. That psychology can be an integral discipline is the 19th century myth that motivated its baptism as an independent science — a myth which can be shown to be exactly that, both by a priori and empirico-historical considerations. My position suggests that the noncohesiveness of psychology finally be acknowledged by replacing it with some such locution as "the psychological studies." The psychological studies, if they are really to address the historically constituted objectives of psychological thought, must range over an immense and disorderly spectrum of human activity and experience. If significant knowledge is the desideratum, problems must be approached with humility, methods must be contextual and flexible, and anticipations of synoptic breakthrough held in check. Moreover, the conceptual ordering devices, technical languages ("paradigms," if you prefer) open to the various psychological studies are — like all human modes of cognitive organization — perspectival, sensibility-dependent relative to the inquirer, and often noncommensurable … Because of the immense range of the psychological studies, different areas of study will not only require different (and contextually apposite) methods, but will bear affinities to different members of the broad groupings of inquiry as historically conceived. Fields like sensory and biological psychology may certainly be regarded as solidly within the family of the biological and, in some reaches, natural sciences. But psychologists must finally accept the circumstance that extensive and important sectors of psychological study require modes of inquiry rather more like those of the humanities than the sciences.*

**-Frank Kessel**
University of New Mexico

## References and Further Reading

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Leary, D. (2001). One big idea, one ultimate concern: Sigmund Koch's Critique of Psychology and Hope for the Future. *American Psychologist*, *56*, 425–432.

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## AT RANDOM

*"We can't just accept the conclusions of a paper without investigating the evidence behind the conclusions — especially the statistical evidence. So we must improve our understanding of statistical methods and uses."*

-**Tom Siegfried**, Editor at Large, *Science News*, speaking at the World Conference of Science Journalists 2017 in San Francisco.

## NEW BOOKS

***Dollars and Sense: How We Misthink Money and How to Spend Smarter***
by Dan Ariely and Jeff Kreisler; Harper.

***Invisible Mind: Flexible Social Cognition and Dehumanization***
by Lasana T. Harris; MIT Press.

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# The Grawemeyer Awards

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### The Nomination Process

The University invites nominations from throughout the world by individuals, professional associations, university administrators, and publishers or editors of journals and books in Psychology. Self-nominations are not permitted. Upon receipt of their nomination, nominees will be notified about the award conditions, the selection process and the supporting materials needed.

### Nominations Must Include:

- A one-page to two-page letter of nomination, in English, identifying the specific idea being nominated and delineating the reasons why the idea merits the award, based on the criteria above.
- A current mailing address, telephone number, and e-mail address for the nominee.

**Send Nominations** (by mail, fax or email) **no later than February 28, 2018 to:**

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| 2006 | Lynn Nadel & John O'Keefe |
| 2007 | Giacomo Rizzolatti, Vittorio Gallese & Leonardo Fogassi |
| 2008 | Albert Bandura |
| 2009 | Anne Treisman |
| 2010 | Ronald Melzack |
| 2011 | Walter Mischel |
| 2012 | Leslie Ungerleider & Mortimer Mishkin |
| 2013 | Irving Gottesman |
| 2014 | Antonio Damasio |
| 2015 | James McGaugh |
| 2016 | Steven Maier |
| 2017 | Marsha Linehan |

# National Academies Report Calls for Increased Behavioral Research Within the Weather Enterprise

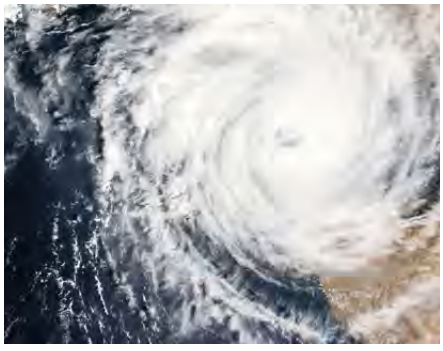
The hurricanes that pounded Texas, Florida, Puerto Rico, and other sites over the summer of 2017 have caused terrible loss of life and tremendous damage. Scientists recognize that hurricanes and other significant weather events — in addition to meteorology and weather forecasting more generally — have obvious connections to the earth sciences. But a new report from the National Academies of Sciences, Engineering, and Medicine (NASEM) concludes that many behavioral and social factors are also at play in the weather enterprise — and that psychological scientists have an important responsibility to participate in weather research.

"There is a growing recognition that a host of social and behavioral factors determine how we prepare for, observe, predict, respond to, and are impacted by weather hazards," the report highlights.

This NASEM report, released in November 2017, summarizes a 15-month investigation headed by a committee including APS Fellow **David V. Budescu**, along with oversight from the National Academies' Board on Human-Systems Integration, Board on Atmospheric Sciences and Climate, and Board on Environmental Change and Society.

Among many findings, the report observes that participation from social and behavioral scientists in the weather enterprise is crucial for advancing knowledge.

"While efforts to advance meteorological research and numerical weather prediction must continue, realizing the greatest return on investment from such efforts requires fully engaging the social and behavioral sciences — both to expand the frontiers of knowledge within [social and behavioral science] disciplines, and to foster more extensive application of these sciences across the weather enterprise," the report reads.



The report recommends that weather enterprise leaders should bring behavioral science expertise into their leadership teams; advance research at the behavioral science–weather interface; and advance analysis on system-focused research, risk assessments and responses, and the delivery and design of messages related to weather. In particular, the report calls on the US National Oceanic and Atmospheric Administration, the National Science Foundation, the Federal Highway Administration, and the Federal Emergency Management Agency to expand their behavioral science research portfolios.

# Fredrickson Receives TANG Prize for Positivity Research

APS Past Board Member **Barbara Fredrickson** has been awarded the TANG Prize for Achievements in Psychology. Fredrickson, a Kenan Distinguished Professor of Psychology and Neuroscience at the University of North Carolina at Chapel Hill, is best known for her "broaden-and-build theory," which suggests that positive emotions evolved in humans and other animals as a way of encouraging the development of beneficial traits, social bonds, and abilities.

Author of more than 100 peer-reviewed articles, Fredrickson's research has expanded psychology's understanding of the mind–body connection, positing that people can improve their physical and mental health by learning to replace negative thoughts with feelings of joy, gratitude, and love.

Fredrickson's books, *Positivity* and *Love 2.0*, have been translated into more than 20 languages, and a free online course on her findings has reached students in more than 190 countries. In 2010, Fredrickson was invited to share her research with the Dalai Lama. Fredrickson will receive the TANG Prize at a ceremony on November 12 at The Arts and Letters Club of Toronto, where she will give a special lecture titled "Positivity Resonates." The award includes a $100,000 cash prize.

## AT RANDOM

*"You can have a mood disorder and be creative, but those things are in no way dependent on one another."*

-Psychological researcher **Christa Taylor**, University of Albany, State University of New York, on her review of research on mood disorders and creativity. Her article appears online in *Perspectives on Psychological Science*.

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# Improving the Reproducibility of Our Research Practices Using Open Science Framework

With:


APS Fellow Brian Nosek
*University of Virginia*
*Executive Director, Center for Open Science*

Courtney Soderberg
*Statistical and Methodological Consultant*
*Center for Open Science*


In this six-part workshop, APS Fellow Brian Nosek and Courtney Soderberg of the Center for Open Science review laboratory and personal research practices to improve reproducibility. Topics include project and data management, preregistration, managing collaborations, and getting the most out of the Open Science Framework for private and public laboratory operations. The workshop was recorded at the 28th APS Annual Convention in Chicago in 2016.



Available now at **www.youtube.com/user/PsychologicalScience**.


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# Powerful Tools for Designing Powerful Studies

Why do studies fail to replicate? There are several possible explanations, but a notable one is that many studies are underpowered — that is, they have sample sizes that are simply too small given the size of the effect under investigation. In an article in *Psychological Science*, researchers from the University of Notre Dame explain why many studies end up inadequately powered and offer open-source tools that can help researchers proactively avoid the problem.

Statistical power, as psychological scientists Samantha F. Anderson, Ken Kelley, and APS Fellow Scott E. Maxwell describe in their article, is the "probability of rejecting the null hypothesis of no effect when the true effect is nonnull in the population." Researchers want to be fairly confident that they'll be able to detect an effect if one truly does exist — ensuring their studies have adequate power is an important component of experimental design.

To do this, they calculate the total number of participants needed to detect an effect of a specific size with their targeted level of power. Researchers can't know how big an effect actually is in the population, so they often estimate it using effect sizes in published studies. And this is where the problem arises, Anderson and colleagues argue, as such effect-size estimates have several inherent flaws.

One notable flaw, the researchers explain, is that an effect size in published research is likely to be greater than the true population effect size due to the so-called file drawer problem. A publication bias that strongly favors statistically significant findings produces a literature with upwardly biased effect size estimates.

Estimates based on previously published effect sizes also fail to account for the uncertainty intrinsic to statistical inferences. Researchers can specify the uncertainty of an effect size via a confidence interval that indicates the range of values within which the true population effect size is likely to exist. This uncertainty is often ignored, however, when researchers use the single-value point estimate from published studies to determine the sample size required for their own studies.

"Given the ubiquity of bias and uncertainty in estimates of effect size, researchers who conscientiously plan their sample sizes using published effect sizes from prior studies can have actual power that is abysmal, especially when the population effect size is small," Anderson, Kelley, and Maxwell write.

Underpowered studies mean that researchers may not be able to detect effects when they do exist, but they can also have other consequences, including increasing the proportion of studies in the literature that falsely find an effect when it *doesn't* exist and producing effect-size estimates that are inflated. In a broader context, they also limit the replicability of study findings.

Building on a strategy originally proposed by Taylor and Muller in 1996, Anderson and colleagues outline a procedure that enables researchers to account for these flaws from the beginning by adjusting effect-size estimates for publication bias and uncertainty

Researchers can use this method for free via an open-source R package (BUCSS) and web-based apps — they simply need to have a few key pieces of information to use these platforms.

"We hope that more accurate estimates of effect size will result in new psychological studies that are more adequately powered and will lead to a replicable literature that inspires more confidence and is less in crisis," Anderson, Kelley, and Maxwell conclude. ●

**-Anna Mikulak**

American Psychological Association

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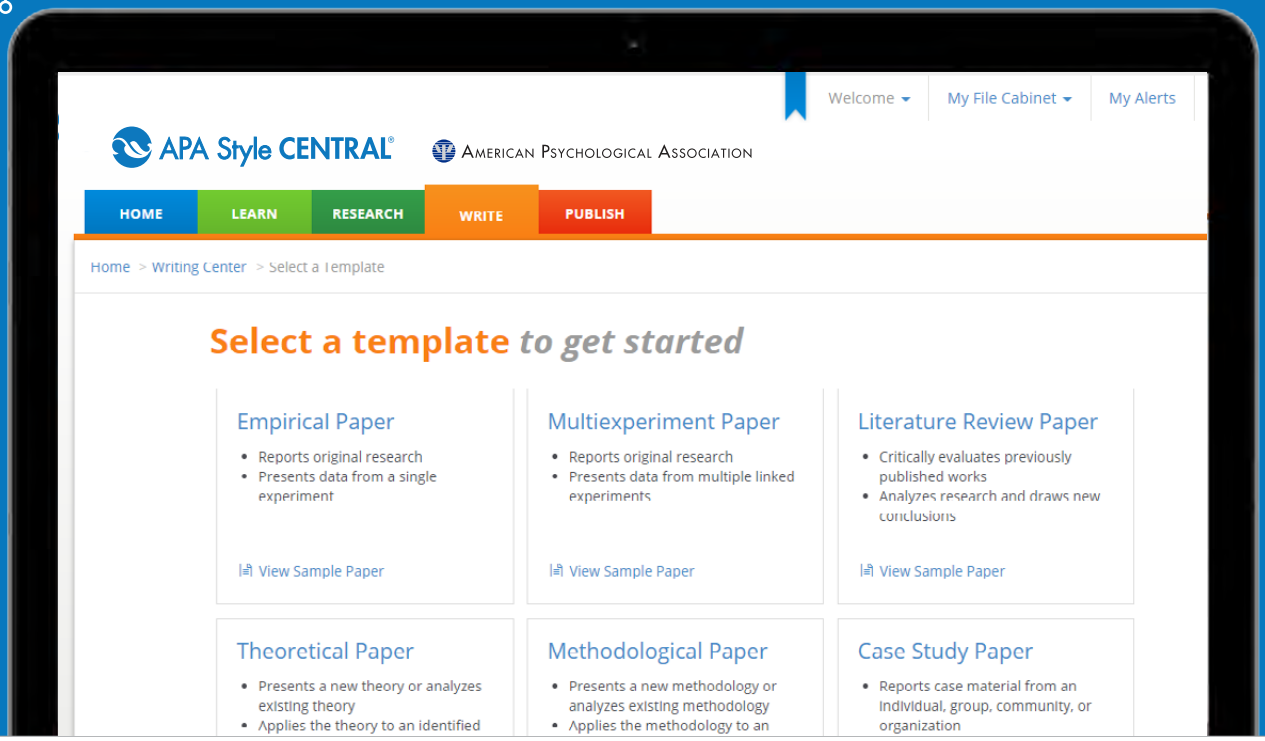



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# The Latest on *AMPPS*

## *Editor Daniel J. Simons Aims to Develop a Go-To Resource for Research Innovations*

*The new APS journal devoted to research methods and practices is receiving a steady flow of submissions and has already accepted a number of papers for publication.* Advances in Methods and Practices in Psychological Science *(*AMPPS*) is APS's sixth journal. The editorial scope of the journal will encompass the breadth of psychological science, with editors, reviewers, and articles representing a balance among diverse disciplinary perspectives and methodological approaches.*

AMPPS *will be published quarterly, initially both in print and online, and will also use the "Online First" publication practice employed by other APS journals. The first issue will appear in early 2018. Submissions guidelines can be found at www.psychologicalscience.org/publications/ampps.*

AMPPS *Editor-in-Chief* ***Daniel J. Simons*** *(University of Illinois at Urbana–Champaign) and his editorial team are reviewing invited submissions for a special section in the first issue on data sharing. The* Observer *recently interviewed Simons about the objectives behind the journal and how those goals will be reflected in the pages of the publication.*

***Methodological issues and advancements have been touched on in other APS journals. What was the reasoning (thought process) behind creating a new journal to focus on these topics?***

Although psychology has several excellent method-focused journals, most of the articles in those journals target an audience of statisticians and methodologists. They include articles written by methodologists for methodologists. Over the past 5 years or so, we've seen a groundswell of interest in research practices and improving methods — the innovations and issues that methodologists have long discussed are now of interest far more broadly. That growing interest was reflected in and furthered by the many articles published in *Perspectives on Psychological Science*, for example. Given that broadening interest in best practices as well as the many new and innovative approaches to large-scale research such as Registered Replication Reports (RRRs), ManyLabs studies, and other consortium-based projects, we felt the time was right for an outlet focused on best practices, methods, and innovative approaches to psychology.

***What do you hope will set* AMPPS *apart from other methodology-focused journals?***

The biggest difference between *AMPPS* and other method journals is one of audience. The target audience for *AMPPS* is the broad membership of APS: researchers and readers from all areas of psychology who use a wide variety of approaches in their own work. The goal is to help APS members enhance their own research skills and knowledge of innovative research practices. Although many of the ideas discussed in the pages of *AMPPS* will appeal to methodologists as well as non-methodologists, articles will be targeted to an audience of non-experts.

**Daniel J. Simons**

Another difference between *AMPPS* and other method journals is the variety of article types we will publish. In addition to articles describing new techniques, we will publish meta-science articles, discussions and debates about research practices, tutorials designed to provide hands-on skill development, and empirical work that adopts novel approaches (e.g., RRRs and large-scale collaborations, multi-lab registered reports, etc.).

***How do you think this journal fits into the discussions about open science and replicability? What role (if any) do you feel the journal will play in this conversation?***

*AMPPS* will include articles on research best practices and meta-science, including discussion and debate about replicability and open science. Although many in our field agree on the need for improving the robustness of the psychological literature, the push for best practices is not a monolithic "movement." Advocates for open science and replicability

➡

disagree on the best approaches to reach those goals. As just one example, open science advocates differ on whether peer review should be entirely open or completely blinded. Some advocate for making all reviews and action letters public. Others argue that the review process could be improved, eliminating biases, by using a triple blind procedure: The authors' identities are masked to both reviewers and the editor, and reviews are anonymous. At *AMPPS*, we hope to discuss disparate perspectives on how to improve our science.

***One of the goals of this journal seems to be the introduction and discussion of new methodological and analytic techniques — topics that can be highly technical and nuanced. What steps will the journal take to make this type of information accessible to all readers?***

Making sure that articles are accessible to a wide readership is essential to the success of *AMPPS*. The editorial team is working closely with authors to ensure that their papers are accurate, precise, and accessible. Although equations are often the most precise and concise way to convey an idea or construct, equations in the absence of explanation tend to hurt comprehensibility for non-experts. To that end, we insist that all terms in any equations have a plain-text explanation written at the level of a first year graduate student in psychology. That said, we don't want to eliminate math from a method-focused journal. My goal is to encourage readers to delve into the details once an idea has grabbed their interest. We don't want math to be a deterrent to thinking about best practices, but we also want to encourage readers to delve into the math when they want a complete understanding. One approach we're taking is to encourage the use of "In Detail" text boxes. These boxes will appear in the text of the manuscript and can be used to provide derivations, proofs, or further mathematical explanation. They can safely be skipped if a reader wants a more surface understanding of the ideas in the paper, but we hope that the article text will spur interested readers to learn more and to work through the details to gain a deeper understanding.

***What special topics and sections do you have planned for upcoming issues?***

For the initial issue, we have a special section on the challenges of making data as open and available as possible. For some types of data, de-identifying participants and posting publicly is trivial. For other types of data, it is anything but (e.g., longitudinal health data). The section will include invited papers addressing the ethical and practical issues involved in making more complex data available.

***Where do you hope to see the journal in 5 years?***

In 5 years, I hope that *AMPPS* will be the go-to source for new ideas about research practices and methods in psychology. It will be a resource for all researchers in psychology that helps them stay up-to-date on the latest method tools and research practice innovations. ●

*APS Award Address*

# The IQ of Smart Fools

## *Robert J. Sternberg on Creativity and Common Sense*

*One day long ago in Baghdad, a merchant's servant came back from the market shaking with fright. There, he'd bumped into a woman he recognized instantly as Death herself. Terrified by her threatening gestures, he borrowed his employer's horse and rode to the city of Samarra, where he believed Death would not find him.*

*When the merchant returned to the market, he encountered the same woman, and asked why she had threatened the other man.*

*"That was not a threatening gesture," she said. "It was only a start of surprise. I was astonished to see him in Baghdad, for I had an appointment with him tonight in Samarra."*

APS William James Fellow Robert J. Sternberg uses this story to allegorize how standardized tests — and their explicit focus on IQ — may be pushing the American education system toward an inevitable dead end.

"This is the race to Samarra. This is the race down, and we're choosing people to help run that race faster," said Sternberg, a professor of human development at Cornell University and editor of *Perspectives on Psychological Science*.

During his APS William James award address at the 2017 APS Annual Convention in Boston, Sternberg said that universities may not be selecting the most career-ready applicants because "alphabet tests" such as the Scholastic Aptitude Test (SAT) and ACT primarily reflect IQ, a measure of abstract-analytical thinking, while neglecting the other skill sets recognized in his triarchic theory of intelligence. Practical thinking, creativity, and wisdom are just as, if not more, important that IQ when it comes to ensuring a longer and more productive future for society, Sternberg explained.

"It's not just being smart. It's using your smartness and knowledge toward a common good," he said. "We should be developing active, concerned citizens and ethical leaders."

Prior to the introduction of standardized tests in the 1960s, university admissions were primarily determined by family connections, Sternberg said. When James Bryant Conant, then-president of Harvard, first began using the SAT to assess applicants, it was intended to mark a shift toward meritocracy over nepotism. But that wasn't a complete success.

"It turns out the tests were a way of laundering social class," Sternberg said.

IQ scores have been found to correlate highly with applicants' socioeconomic status, and colleges often select and reward people who may not have society's best interests at heart, Sternberg said. The high IQ of a man who studies environmental law only to provide legal counsel for polluters might benefit his career as an individual, but it's not necessarily doing much for the greater good, for example.

**Robert J. Sternberg** says that pairing tests such as the SAT/ACT with measures of practical thinking and creativity can more accurately predict students' college and career readiness than can IQ alone.

While IQ scores have increased by an average of 30 points since 1909, the result of a gradual increase in intelligence known as the "Flynn Effect," that doesn't mean people are using that additional intelligence to make wise and ethical decisions, Sternberg said.

He said this may be in part because our education systems' emphasis on analytical skills at the cost of creativity and common sense encourages people to become "smart fools" — that is, people who possess intelligence without wisdom.

"A lot of people with high IQs are especially susceptible to foolishness because they think they're not — they are smart fools," Sternberg said.

According to Jean Lipman-Blumen's book, *The Allure of Toxic Leaders: Why We Follow Destructive Bosses and Corrupt Politicians*, this kind of foolishness can spur people to support demagogues who lead by feeding their followers' illusions, undermining institutions, and setting constituents against each other.

"To do these things, you have to be pretty damn smart," Sternberg said of these toxic individuals. "You have to have a pretty high IQ or, if you don't, you need to have people on your staff who are good at this stuff. It's not that IQ is bad, but if it's not moderated, and somehow modulated, by creativity, rational thinking, common sense, and wisdom, it can be a real problem."

Within the field of psychology, Sternberg continued, the "race to Samarra" can manifest through academia's preference

➡

# CALL FOR APPLICATIONS

# James McKeen Cattell Fund Fellowship

*Presented in partnership with*

**Association for Psychological Science**

**Application deadline: January 15, 2018**

For over half a century, the James McKeen Cattell Fund has provided support for the science and the application of psychology. The James McKeen Cattell Fund Fellowships supplement the regular sabbatical allowance provided by the recipients' home institutions to allow an extension of leave time from one to two semesters.

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*Questions?*

Christina L. Williams
williams@psych.duke.edu
www.cattell.duke.edu

*Eligibility Requirements*

James McKeen Cattell Fund awards are available to psychologists and other researchers in the broad field of psychological science who are faculty members at colleges and universities in the United States and Canada and are eligible, according to the regulations of their own institutions, for a sabbatical leave or its equivalent.

Candidates are eligible for a Cattell Award if they are currently tenured or will have formal University or College confirmation that they will be tenured by February 1, following our January 15, 2018 submission deadline.

Candidates are eligible for a Cattell Award if they have not had a leave with pay for the 5 years preceding the requested sabbatical leave (medical or pregnancy leaves are considered exceptions).

Prior recipients of a Cattell Fund Award are not eligible.

To be eligible for this year's awards, candidates must not be on sabbatical at any time during the Academic Year 2017–18. Sabbaticals must be for the Academic Year 2018–2019.

**The deadline for submissions is January 15, 2018.**
**Applications may be submitted online: www.cattell.duke.edu/cattappl.html.**

James McKeen Cattell established the Fund in 1942 to support "scientific research and the dissemination of knowledge with the object of obtaining results beneficial to the development of the science of psychology and to the advancement of the useful application of psychology."

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www.psychologicalscience.org/cattellfund
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for students who test well over those who exhibit the kind of creativity and scientific reasoning required to succeed as researchers.

This concern is based not just on Sternberg's experience with his own graduate students, but on a recently submitted study he carried out with his wife Karin Sternberg, a research associate at Cornell University. In 2 out of 3 trials, they found that SAT/ACT scores may not be correlated with students' ability to generate hypotheses, design experiments, evaluate experiments, and review studies.

These findings also echo Sternberg's earlier research with the Rainbow Project during his time at Yale. There, studies found that tests of creative thinking, such as writing a short story or designing advertisements, combined with tests of practical and analytical thinking, were twice as predictive of students' freshman-year GPAs as were the SAT/ACT alone. These ideas were implemented in admissions during Sternberg's time as an administrator at Tufts and at Oklahoma State.

"Whatever it is that the standardized tests test for, they're not fully measuring the skills you really need to succeed in life," Sternberg said.

That isn't to say the abstract-analytical reasoning skills measured by alphabet tests aren't valuable, Sternberg continued, just that universities should take other qualities into account if they want to foster the wisdom necessary for graduates to make a meaningful difference in society. Otherwise, we may end up with smart (and some not so smart) fools leading our institutions and our countries.

"Wisdom is the use of knowledge and skills toward a common good. It's not just being smart — it's using your smartness and your knowledge for the common good by balancing your own interest with other people's interests, over the long as well as short term, through the mediation of positive ethical values," Sternberg concluded. ●

**-Kim Armstrong**

**To watch video of Robert J. Sternberg's award address, visit psychologicalscience.org/r/intelligence.**

More than **35,000 people are using Wikipedia to learn about psychology** every month. Yet, of the more than 8,000 psychology-related articles in Wikipedia, *fewer than 0.01%* have been assessed to have the quality of a professional encyclopedic entry. **Hundreds of articles are missing accurate content and reliable citations.**

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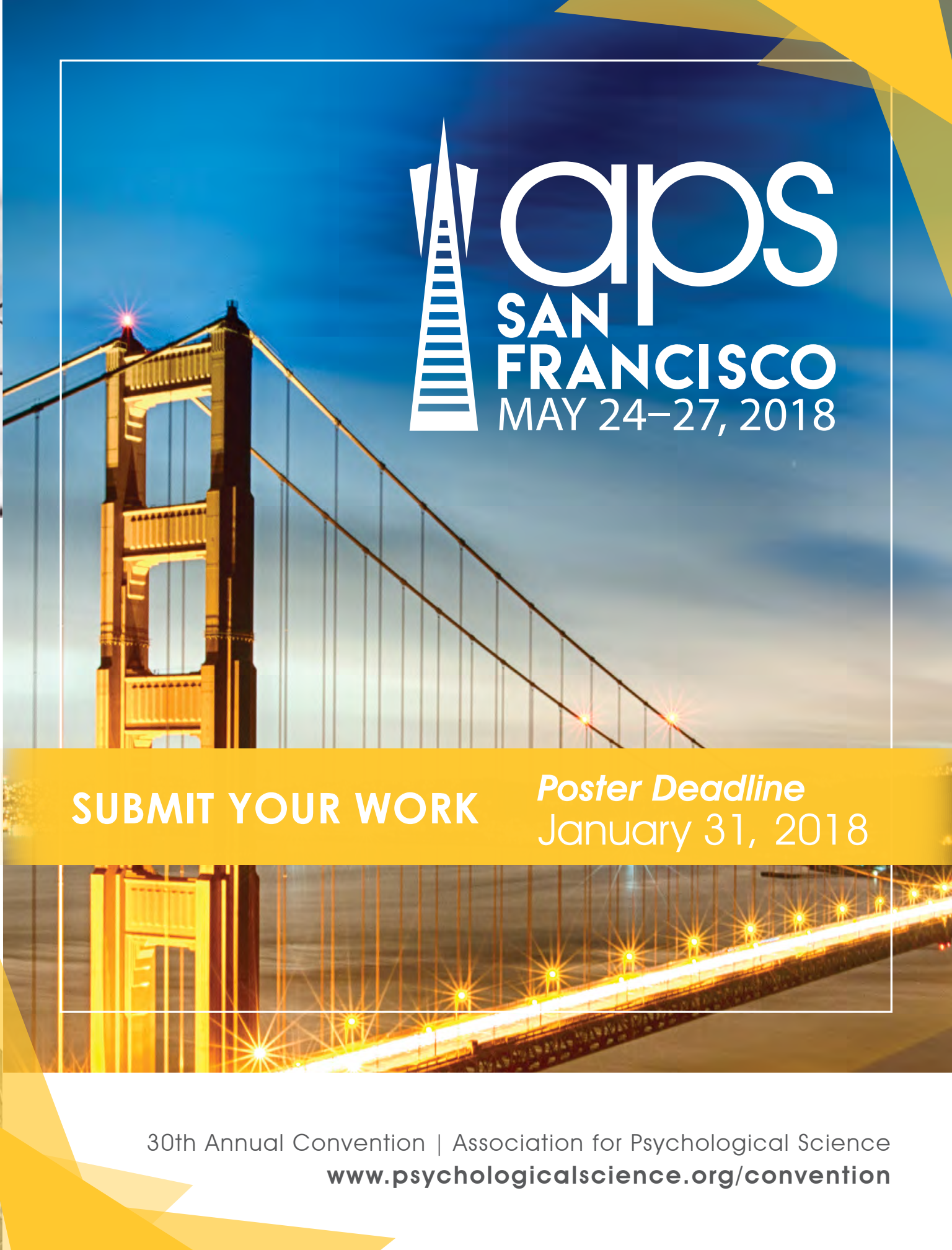


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FRED KAVLI KEYNOTE ADDRESS

## Making and Remaking Memory: Past, Present and Future

Lynn Nadel
The University of Arizona

BRING THE FAMILY ADDRESS

## The Paradox of Diversity: Promise, Pitfalls, and Implications for Racial Progress

Jennifer Richeson
Yale University

Inside the Psychologist's Studio

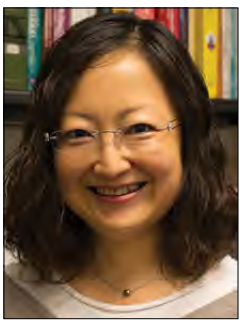
**Henry L. Roediger, III** will be featured in the Inside the Psychologist's Studio program at this year's convention. Interviewed by **Suparna Rajaram**, Stony Brook University, The State University of New York

PRESIDENTIAL SYMPOSIUM

## Memory: From Neurons to Nations

Suparna Rajaram (Chair)
Stony Brook University,
The State University of New York

Dorthe Berntsen
Aarhus University, Denmark



Qi Wang
Cornell University

Charan Ranganath
University of California, Davis

Henry L. Roediger, III
Washington University in St. Louis

# AWARD ADDRESSES

## JAMES MCKEEN CATTELL FELLOW AWARDS

**Trauma and Society: Why Social Factors Matter for Coping With Trauma**
Richard A. Bryant
University of New South Wales, Australia

**Men are From Earth, Women Are From Earth: The Science of Gender Differences and Similarities**
Janet Shibley Hyde
University of Wisconsin-Madison

**Applying Psychological Science to Educational Computer Games**
Richard E. Mayer
University of California, Santa Barbara

## WILLIAM JAMES FELLOW AWARD ADDRESSES

**The Brain, Social Neuroscience, and Social Isolation**
John T. Cacioppo
The University of Chicago

**Capacity Constraints in Cognitive Control: Toward a Rational Explanation**
Jonathan D. Cohen
Princeton University

**Does Language Change Thought?**
Barbara Landau
Johns Hopkins University

**Word Learning From the Infant's Point of View**
Linda B. Smith
Indiana University Bloomington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## CROSS-CUTTING THEME PROGRAMS

### Science of Inequality

Katie A. McLaughlin
University of Washington

Ezemenari M. Obasi
University of Houston

Deanna M. Barch
Washington University in St Louis

Keith Payne
The University of North Carolina at Chapel Hill

Johannes Haushofer
Princeton University

Anandi Mani (Discussant)
University of Oxford, United Kingdom

### My Truth or Yours: The Science of Reality Monitoring

Jon S. Simons
University of Cambridge, United Kingdom

Donna Rose Addis
The University of Auckland, New Zealand

Karen M. Douglas
University of Kent, United Kingdom

Jacqueline D. Woolley
The University of Texas at Austin

Steven A. Sloman (Discussant)
Brown University

### Technology and the Human Experience: Shaping Thoughts, Feelings, Development, and Interactions

Adam H. Gazzaley
University of California, San Francisco

Sara J. Czaja
University of Miami Miller School of Medicine

Jonathan Gratch
University of Southern California

Gloria Mark
University of California, Irvine

Justine Cassell
Carnegie Mellon University

Submit a poster presentation related to any of these topics before January 31, 2018 and let your work be part of these special discussions. Submissions not accepted for a theme poster session are automatically considered for one of the regular poster sessions.

## INVITED TALKS

### Sleep Now, Laugh Later: Restricted Sleep Blunts Children's Positive Emotional Responses

Candice A. Alfano
University of Houston

### Being and Becoming Bilingual

Judith F. Kroll
University of California, Riverside

## INVITED ADDRESSES

### How Subtle Biases Can Profoundly Influence Our Workplaces

Michelle "Mikki" R. Hebl
Rice University

### Reading the Brain: Promise, Perils, and Future of Brain Imaging

Russell A. Poldrack
Stanford University

### Relational Reasoning and Development

Silvia A. Bunge
University of California, Berkeley

### Is There Really an Endowed Sense of Number?

Rafael Nunez
University of California, San Diego

### Variability and Consistency in Early Language Learning: The Wordbank Project

Michael C. Frank
Stanford University

### Personality Measurement and Prediction in Selection

Nathan Carter
University of Georgia

### Dynamic Change in Sexuality Across Multiple Time Scales

Lisa M. Diamond
The University of Utah

# INVITED SYMPOSIA

## Threat Imminence, Controllability, and Agency

Luiz Pessoa (Chair)
University of Maryland University College

Justin Moscarello
Texas A&M University

Catherine Hatley
New York University

Dean Mobbs
Caltech Conte Center

Joseph Dunsmor
The University of Texas at Austin

## Predictive Coding and Emotion

Aprajita Mohanty (Co-Chair)
Stony Brook University, The State University of New York

Luiz Pessoa (Co-Chair)
University of Maryland University College

Aprajita Mohanty
Stony Brook University, The State University of New York

Lisa Barrett
Northeastern University

Paul Fletcher
University of Cambridge, United Kingdom

Moshe Bar
Bar-Ilan University, Israel

## Exploring the Controversy Over Complicated Grief

Mary-Frances O'Connor
The University of Arizona

George A. Bonanno
Columbia University

Robert A. Neimeyer
The University of Memphis

## Learning About Learning and Memory: Showcasing Research From Institutions That Emphasize Undergraduate Scholarship

Paula T. Hertel
Trinity University

Deborah Burke
Pomona College

Daniel Reisberg
Reed College

Jimmeka J. Guillory
Spelman College

Kelly A. Bennion
California Polytechnic State University

## Cross-Cultural Psychology

William Hirst (Chair)
The New School for Social Research

Ying-yi Hong
The Chinese University of Hong Kong

Krishna Savani
Nanyang Business School, Singapore

Angela Gutchess
Brandeis University

## Cognition in the Internet Age

Elizabeth J. Marsh (Co-Chair)
Duke University

Suparna Rajaram (Co-Chair)
Stony Brook University, The State University of New York

Daniel M. Russell
Google

Benjamin C. Storm
University of California, Santa Cruz

Anthony D. Wagner
Stanford University

## Teams and Teamwork in Organizations

Dorothy R. Carter (Chair & Speaker)
University of Georgia

Steve W.J. Kozlowski
Michigan State University

C. Shawn Burke
University of Central Florida

Suzanne T. Bell
DePaul University

Daniel Newton
Arizona State University

## The Games People Play: Neural Mechanisms and Behavioral Decisions

Carsten KW de Dreu (Chair)
Leiden University, The Netherlands

Nir Halevy
Stanford University

Daniel P. Balliet
Vrije Universiteit Amsterdam, The Netherlands

Molly J. Crockett
University of Oxford, United Kingdom

Grit Hein
Goethe University Frankfurt, Germany

## INVITED SYMPOSIA *(CONTINUED)*

**30 Years of Affective Science in the Bay Area: A Look at How Far We've Come, and Where We Should Go Next**

Jessica L. Tracy (Chair)
The University of British Columbia, Canada

Robert W. Levenson
University of California, Berkeley

James J. Gross
Stanford University

Barbara L. Fredrickson
The University of North Carolina at Chapel Hill

Ann M. Kring
University of California, Berkeley

Dacher Keltner
University of California, Berkeley

Wendy Berry Mendes
University of California, San Francisco

**Treating People as Means and Ends: New Perspectives on Person Perception, Social Connection, and Objectification**

Lotte F. van Dillen (Co-Chair)
Leiden University,The Netherlands

Lasana T. Harris (Co-Chair)
University College London, United Kingdom

Edward Orehek
University of Pittsburgh

Jeroen Vaes
University of Trento, Italy

Thalia Wheatley
Dartmouth College

## WORKSHOPS

**Missing Data**
Terrence D. Jorgensen
University of Amsterdam,
The Netherlands

**Bayesian Latent Variable Modeling**
Sarah Depaoli
University of California, Merced

**Social Network Analysis**
Gregory D. Webster
University of Florida

**Intro to R**
William Revelle
Northwestern University

David Condon
Northwestern University

Sara J. Weston
Northwestern University

**Mediation With Repeated-Measures and Multilevel Data**
Amanda K. Montoya
The Ohio State University

Nicholas J. Rockwood
The Ohio State University

**Mixture Models**
Irini Moustaki
The London School of Economics and Political Science,
United Kingdom

**Power Analyses in Basic to Mixed Designs**
Jean-Philippe Laurenceau
University of Delaware

Niall P. Bolger
Columbia University

**Meta-Analyses of Single Studies and Entire Fields**
Blakeley B. McShane
Northwestern University

**Reproducible Workflow**
Katie Corker
Grand Valley State University

**Intro to Programming in Matlab**
Cendri Hutcherson
University of Toronto Scarborough, Canada

**Mouse Tracker**
Jonathan B. Freeman
New York University

**Scientific Writing for Psychological Scientists**
Robert V. Kail
Purdue University

Separate registration is required for Workshops, and is open to Convention and/or Teaching Institute registrants only.

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Appalachian State University

Anna Ropp
Metropolitan State University of Denver

Jordan D. Troisi
Sewanee: The University of the South

Anne Ferrari
The College of New Rochelle

Kristen A. Diliberto-Macaluso
Berry College

Melissa J. Beers
The Ohio State University

The APS-STP Teaching Institute is a pre-conference Teaching Institute sponsored by the Association for Psychological Science and the Society for the Teaching of Psychology. The day-long program offers informative talks and practical advice from experts on the teaching of psychological science as well as poster presentations centered on this theme. The Teaching Institute starts on Wednesday, May 23 with an evening workshop, and will continue all day on Thursday, May 24. Please note that separate registration is required.

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Lotte van Dillen
Leiden University, The Netherlands

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Elliot Aronson
Joshua M. Aronson
Daniel P. Balliet
Mahzarin R. Banaji
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***Speakers as of publication date. Additional speakers will be announced later this winter.***

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# THE HIDDEN COSTS OF SLEEP DEFICITS

## Psychological Scientists Explore the Impact on Social Functioning

Throughout modern history, the concept of a good night's sleep has often been painted as almost an indulgence. Virginia Woolf referred to it as "that deplorable curtailment of the joy of life." Vladimir Nabokov called it "the most moronic fraternity in the world." And more recently, internet pioneer Vint Cerf simply dismissed sleep as "a waste of time."

These types of sentiments — along with burdensome work schedules and plenty of electronic distractions that make it tempting and easy to delay bedtime — are seeping into everyday life across the industrialized world. Recent reports indicate that nearly 30% of American adults report an average of 6 or fewer hours of sleep per night — at least an hour short of the amount recommended by the World Health Organization. School-age children ideally should have 10 hours of daily sleep, but heavy homework loads, crack-of-dawn school starts, and extracurricular activities are keeping them up far too late and forcing them out of bed way too early.

Science has produced a strong body of evidence showing how lack of sleep impairs not only a variety of bodily functions, but also cognitive processes such as memory and executive control.

"There does not seem to be one major organ within the body, or process within the brain, that isn't optimally enhanced by sleep (and detrimentally impaired when we don't get enough)," says

***Observer* Staff Report**
*Contact apsobserver@psychologicalscience.org.*

Matthew P. Walker, a cognitive psychologist who heads the University of California, Berkeley's (UCB) Sleep and Neuroimaging Lab, in his book *Why we sleep: Unlocking the power of sleep and dreams*.

Psychology scientists are expanding the scope of sleep research to explore how ties between sleep and cognition affect central aspects of our societal fabric, including fairness, justice, relationships, and morality.

## Why Sleep Isn't a Waste of Time

As early as infancy, sleep plays a central role in the development of higher-order cognition, including executive functioning, working memory, and self-control.

As we grow, sleep continues to support mental functioning, including noncognitive abilities such as mastering emotional processing and control.

"Benevolently servicing our psychological health, sleep recalibrates our emotional brain circuits, allowing us to navigate next-day social and psychological challenges with cool-headed composure," Walker writes in his book.

Indeed, research has supported the correlation between sleep and emotion regulation. A lab study led by APS Fellow Iris Mauss of UCB, for example, showed that participants with poor self-reported sleep quality exhibited lowered ability to cognitively reappraise negative thoughts — a key skill in emotional control.

When we don't get sufficient sleep, it can seep into our social lives in a variety of ways, as APS Past Board Member Wendy Berry Mendes and her University of California, San Francisco (UCSF) colleagues Amie M. Gordon and Aric A. Prather point out in an article in the October 2017 issue of *Current Directions in Psychological Science*. In examining the literature on the relationship between sleep and a number of social processes, lead author Gordon and the other scientists note that poor sleepers have difficulty overriding initial impulses and employing effortful cognition, which can produce behavior that is driven by implicit biases. Additionally, sleep deficits may disrupt our ability to process subtle social cues, they note.

Indeed, Walker's own research indicates that a person's ability to accurately read others' emotions, especially nuanced ones, is impeded by insufficient sleep. In a 2010 lab study, Walker assigned college-age participants to evaluate pictures of three different faces expressing varying degrees of sadness, happiness, and anger. Some of the students performed the task once under conditions of sleep deprivation and twice when rested after different durations of sleep. The others evaluated the pictures twice, with plenty of rest both times.

Results showed that participants were less able to recognize moderate expressions of anger and happiness after being deprived of sleep, although they were still able to recognize extreme manifestations of those emotions.

University of Arizona neuropsychologist William D.S. Killgore and his colleagues published results of a similar experiment using a larger set of emotional depictions, part of an examination of sleep deprivation's effects on social, emotional, and moral judgment that began while Killgore worked as a research psychologist for the US Army. He notes that such results show how insufficient sleep can take a toll on critical social interactions.

"You may be responding inappropriately to somebody that you just don't read correctly, especially those social emotions that make us human," Killgore said. "Or you may not be as empathic. Your spouse or significant other may need something from you and you're less able to read that. It's possible that this could lead to problems in your relationships or problems at work. To me, that is one of the biggest problems — how this affects our relationships."

## Relationship Costs

It seems intuitive that sleep loss could lead to heightened conflict with family, friends, and colleagues: Low on sleep, short on temper.

A 2014 empirical report authored by UCSF's Gordon and APS Fellow Serena Chen (UCB) showed some correlations among sleep quality, emotions, and relationship conflict. In one lab study, the researchers asked 70 heterosexual couples to discuss a top source of conflict within their relationship and then offered the couples an opportunity to resolve that conflict while being videotaped. Prior to the conversation, participants independently rated their previous night's sleep duration and quality along with their daytime dysfunction (e.g., current feelings of tiredness). They also completed questionnaires rating their levels of appreciation, caring, anger, resentment, and other emotions, and as well as how much they thought their partners had experienced those emotions. Three independent observers also watched the conflict conversations and coded each individual's affect.

In multilevel analyses of the measures, Gordon and Chen found that participants who reported poor sleep the previous night showed more negative and less positive affect during the conflict conversation, as did their partners. The independent coders corroborated those results. What's more, the people who slept poorly were less able to gauge their partners' feelings, and their partners showed a similar impediment in empathy. The data indicated that couples were best able to resolve the conflict during the experiment if both were well-rested. If one partner slept poorly, it hindered conflict resolution.

## Economic Costs

The costs of sleep deprivation appear to be taking a heavy toll on economic vitality as well. A 2016 RAND Europe study concluded that the effects of sleep loss on workplace productivity and mortality risk is costing the combined economies of the leading industrialized nations — the United States, Japan, Germany, and the United Kingdom — $660 billion a year.

In a 2015 article published in *Perspectives on Psychological Science*, Christopher Barnes (University of Washington) and Christopher Drake (Henry Ford Hospital, Sleep Disorders and Research Center) explain how these economic costs seem to arise from employee fatigue.

"Overall, sleep deprived employees will be more prone to mistakes, less aware that they are making mistakes, less creative, and more likely to be injured," Barnes explains. "Other workplace effects include more cyberloafing, less work engagement, more unethical behavior, and jerkier bosses."

Psychological scientists Michael S. Christian (University of North Carolina at Chapel Hill) and Aleksander P.J. Ellis (University of Arizona) conducted a study that demonstrated such effects. Testing the hypothesis that sleep-deprived workers would have more trouble resisting negative impulses than their well-rested peers, Christian and Ellis surveyed 171 nurses at the beginning and end of their shifts, asking them to rate their own levels of sleep deprivation, self-control, and hostility. At the end of their 12-hour shifts, they were asked about whether they had engaged in any deviant behavior, such as making hurtful comments or intentionally working slowly. The results showed that nurses who reported less than 6 hours of sleep the night before were significantly more likely to report committing deviant acts at work than those who were better rested.

In a follow-up study, 75 business students participated in a lab experiment that examined whether sleep deprivation would lead to increased rates of cheating and hostility. The students were divided into two groups: One stayed awake for a full 24 hours in the lab, while the other group was told to sleep normally — no fewer than 7 hours of sleep per night — for the two nights before the experiment.

The next day, both groups of students responded to a set of emails from prospective students who were interested in applying to their business school as part of a new electronic mentoring program. The researchers specifically told the participants that they would be representing the business school with their responses to the potential applicants.

The emails from potential students contained a number of grammatical and spelling mistakes, as well as negative comments about the business school.

Using a predetermined coding system, the researchers rated participants' responses to these emails for inappropriateness, such as making fun of the sender, cursing, or making racial or ethnic remarks.

Participants from the sleep-deprivation condition were significantly more likely to include negative and inappropriate language in their responses, suggesting that they were having more difficulty controlling their emotions than the well-rested participants.

In the same lab experiment, participants had an opportunity to cheat for small amounts of money. First, they took a short pretest measuring reasoning. They then received a similar test and learned that they'd earn $1 for each correct response. Importantly, the participants graded their own tests and rewarded themselves for their correct responses by taking cash out of an envelope in the room.

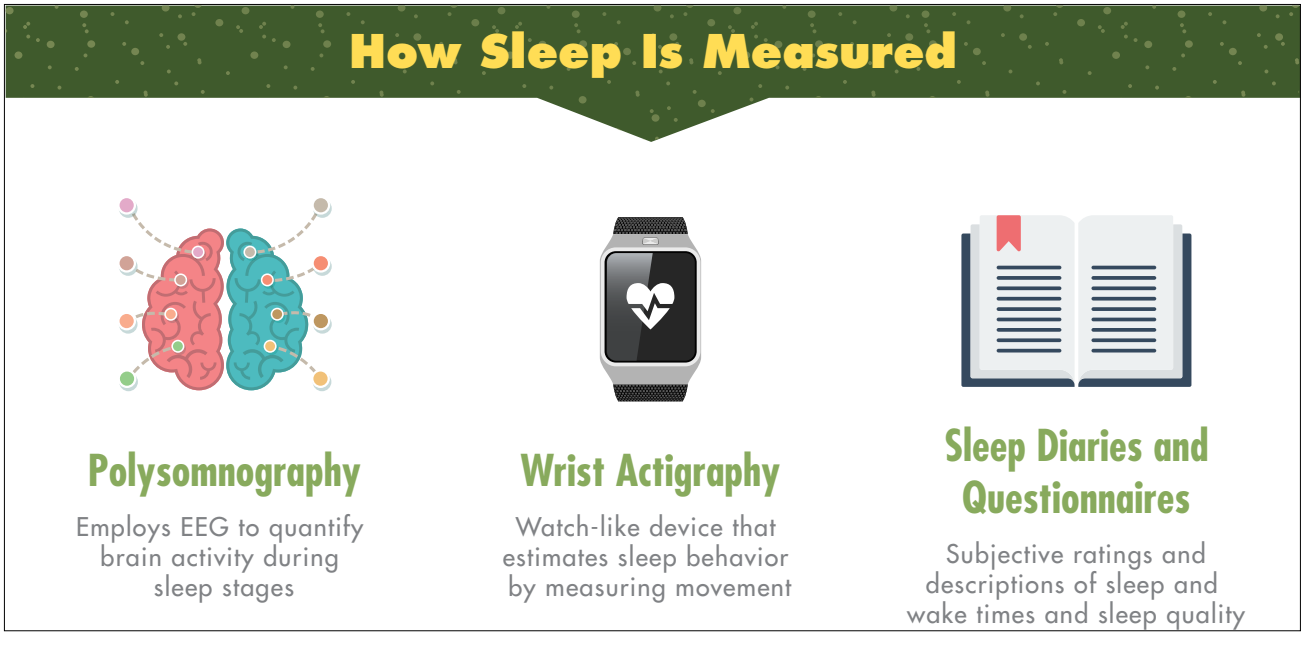
The findings revealed that the sleep-deprived participants were more likely to cheat, taking more cash than they'd actually earned compared with the well-rested group.

Importantly, these results suggest that sleepiness has serious consequences for jobs where regulating emotions are important, such as customer service. Sleep-deprived employees who have difficulty regulating and hiding their negative emotions may be more likely to lash out at an irate customer than their well-rested counterparts.

In another study, Barnes and an international team of researchers revealed the effects that sleep deprivation can have on bosses in the workplace. The research team had supervisors complete a daily sleep survey at the beginning of each day for 10 consecutive workdays. The supervisors' subordinates completed surveys evaluating abusive behavior across this same period of time.

When supervisors slept badly, their staff noticed more abusive behavior. In turn, this created a negative atmosphere in the office, potentially harming the team's productivity.

"In conclusion, our study connects leader sleep quality to daily abusive supervisor behavior, which ultimately results in deleterious outcomes for subordinates," Barnes and colleagues write.



## Legal Costs

In addition to its economic impact, science has identified the impacts of insufficient sleep on another societal cornerstone: criminal justice. That research takes advantage of a natural experiment: the annual conversion to daylight saving time (DST) in North America, Europe, and some parts of the Middle East.

The seemingly small amount of lost sleep (an average of 40 minutes) that most people incur when they advance their clocks an hour had already been linked to an increase in workplace injuries and auto accidents. But a 2016 study showed that the shortened sleep associated with the switch to DST might also affect the severity of sentences doled out by judges.

"We find that the sentences given to those convicted of crimes may be partially polluted by the sleep of those giving the punishments," says researcher Kyoungmin Cho of the University of Washington, first author on the study. "Sleep is a factor that should not play a role in their sentences, but does."

Cho conducted the research with the University of Washington's Barnes and Cristiano L. Guarana (Indiana University Bloomington). The researchers tapped into data on legal sentences handed down between 1992 and 2003 and collected by the US Sentencing Commission. They examined data within each judicial district to account for variation across districts and looked at the length of the sentence given, not including any other types of sentences including community confinement or probation.

To isolate the unique impact of DST, Cho and colleagues took other potential influences, including the yearly trend in sentencing decisions and various characteristics related to both the trial and the offender, into account.

Across multiple analyses, the researchers found a consistent trend: Sentences given on the Monday after the switch to DST were longer than those given on other days. Specifically, Cho and colleagues found that sentences on the so-called "Sleepy Monday" were approximately 5% longer than those given on the previous Monday and the following Monday.

Additional analyses showed that legal sentences handed out on Sleepy Monday were longer than those given on all other Mondays combined, and they were also longer than those doled out on all other days of the year combined.

Importantly, the effect was specific to Sleepy Monday: Sentences given on the other weekdays following the transition to DST did not differ from sentences given 1 week before or 1 week after. Cho and colleagues found that the return to standard time in the fall, when people gain an hour, had no effect on legal sentencing.

To be sure, there are many variables that influence a judge's sentencing decisions, and the average amount of sleep lost due to DST is less than an hour. And yet the data still showed a clear relationship between the time change and sentencing:

"We were surprised at how clearly we were able to detect the hypothesized effect," says Cho. "Across many alternative analyses and robustness checks, the effect was still quite clear and meaningful."

The findings have clear implications for those involved in the legal system, but may also extend to the many other contexts in which people give or receive punishment, Cho said.

"Bosses punish employees who break work rules, parents punish children who engage in bad behavior, teachers punish students who disrupt the classroom environment, and sports referees punish players and athletes who violate the rules of the game," she noted. "Many of the people making these punishment decisions will do so while short on sleep, and the same logic explored in our research will likely apply in those contexts, as well."

Cho plans next to investigate the causal mechanisms that link sleep and punishment decisions, as well as potential strategies for mitigating these effects.

## What's Next

Recognizing the need for more and better sleep research, Gordon, Mendes, and others are urging psychological scientists to take a much closer look at the role that sleep — or a lack of it — plays in our emotional and social functioning, and in our societal structure as a whole. Critical to this effort will be going beyond participant self-reports and lab-based studies to actually measure people and their sleep under more naturalistic conditions. The recent availability of wearable technologies such as fitness trackers offers one promising avenue for more precisely measuring participants' sleep. ●

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*Integrative Science*

# From Aging to Aging Well

## *Researchers Identify the Factors That Help Us Thrive in Older Adulthood*

That our bodies and minds change as we age past midlife is a developmental fact — but what it means to age *successfully* remains an open scientific question. What differentiates those adults who seem to have vibrant and full lives through their 60s, 70s, 80s, and 90s from those who don't? And are there evidence-based ways to actively promote cognitive and mental health as we age?

A panel of researchers explored these questions, integrating physiological, psychological, and sociological perspectives, in a symposium at the 2017 International Convention of Psychological Science in Vienna, Austria.

Today, older adults seem to be a prime demographic for marketers. With age-targeted advertisements promoting everything from adventure-filled vacations to advanced education, there is no shortage of products and opportunities to help older adults live their "best lives." And yet, the idea that thriving in older adulthood was an outcome to strive for is a relatively recent one. It was only 30 years ago that physician and researcher John W. Rowe and psychological scientist Robert L. Kahn challenged the research community to go beyond the notion of "normal" aging, which necessarily entailed some degree of decline, noted symposium chair Corinna E. Loeckenhoff (Cornell University).

Some might argue that "successful aging has turned into a contemporary obsession," she added, and the concept of successful aging, however it is defined, may not generalize across cultures. But one clear benefit of this new perspective on aging, Loeckenhoff said, is that it encourages renewed focus on the processes that contribute to positive age-related outcomes.

### Highlighting Small Pathways With Big Impacts

After decades of study, it's universally accepted that exercise is beneficial for not only physical health but for cognitive health as well. The cognitive benefits of exercise seem especially true for older adults: Extensive research conducted by APS Fellow Arthur F. Kramer (University of Illinois at Urbana-Champaign) and others indicates that regular aerobic exercise protects against age-related losses to brain volume and leads to improvements in cognitive abilities such as executive function and spatial memory.

Focusing on the cardiovascular system as a mechanistic pathway, APS Fellow Monica Fabiani (University of Illinois at Urbana-Champaign) has been investigating the influence of one particular component: the arteries that supply blood to the brain.

Fabiani noted that conditions like arteriosclerosis, plaque formation, and high blood pressure can decrease the elasticity of our arteries and make it difficult for blood to circulate efficiently. This results in diminished blood flow to our highly vascularized brains as we age. But research suggests that exercise may counteract these negative effects.

In studies published in 2014, 2016, and 2017, Fabiani and colleagues found that arterial elasticity in participants ages 55 to 85 (as measured by a pulse relaxation function) was correlated with their overall cardiorespiratory fitness. And it was also correlated with brain structure: Participants who showed high arterial elasticity also tended to show preservation of overall and regional gray matter, overall white matter, and regional white matter structure.

Using tools that gauge regional blood flow to the brain, such as newer optical methods, may eventually be useful in predicting adverse events (like stroke and tissue loss) and protecting against cognitive decline, says APS Fellow Monica Fabiani.

Understanding these regional associations is important, Fabiani explained, because different regions support specific functions that are essential in our everyday lives.

"Yes, it's important to maintain physical health," she noted, "but cognitive health is paramount for independent living."

Additional findings from her team show that elasticity of the left middle cerebral arteries that feed Broca's area is correlated with verbal fluency. Elasticity of the left and right superior precentral arteries that feed the dorsolateral prefrontal cortex also is correlated with participants' working-memory span.

Why does exercise boost brain function as we age? The arteries that supply blood to the brain offer some important clues, says APS Fellow **Monica Fabiani**.

Together, these findings indicate that enhancing blood supply to specific regions of the brain is one important mechanism by which fitness can preserve and promote cognitive and brain health.

Paying attention to the health of these small-scale pathways stands to have a big impact. To put the relationship in context, Fabiani noted that midlife hypertension, obesity, physical inactivity, smoking, and diabetes are major contributors to Alzheimer's disease (AD), and they are all counteracted to some degree by exercise.

"Combined, their effect is humongous on the number of cases worldwide where we could decrease the incidence of AD," she said. "These are factors that could greatly contribute to an improved healthy aging."

Using tools that gauge regional blood flow to the brain, such as newer optical methods, may eventually be useful in predicting adverse events (like stroke and tissue loss) and protecting against cognitive decline, Fabiani noted.

## Flexing for a Healthy Brain

Given that aging often comes with physical impairments, physical therapy researcher and Canada Research Chair Teresa Liu-Ambrose (University of British Columbia) is trying to better understand the effects of another type of exercise: resistance training.

"From a practical perspective, resistance training may be more feasible than aerobic [exercise] for the majority of older adults, especially those with significant mobility issues," she explained.

In one study, Liu-Ambrose and colleagues randomly assigned 155 healthy women ages 65 to 75 to a specific training regimen. Some women engaged in resistance training once a week, others did it twice a week, and a third group engaged in balance-and-tone training twice a week as an active control group.

After 12 months, the women who engaged in twice-a-week resistance training showed a variety of benefits compared with their peers. For example, a subgroup of these women who underwent fMRI scans showed relative improvements in functional activation as they completed a task measuring attentional control. They also showed reduced progression of lesions to the brain's white matter, a particularly important finding considering that these lesions are a notable risk factor for later stroke, cognitive impairment, and dementia.

And findings from a similar study with women ages 70 to 80 suggest that the benefits of resistance training may extend to older adults already diagnosed with mild cognitive impairment (MCI). Liu-Ambrose and colleagues found that women with an MCI diagnosis who engaged in resistance exercises showed unique benefits to executive functions, associative memory, and functional neuroplasticity relative to those who engaged in either aerobic training or balance-and-tone training.

These and other findings suggest that resistance-based exercise improves brain function by protecting or enhancing underlying brain structure in particular ways. But more research is needed to probe mechanistic pathways.

"We do lack good animal models of resistance training — much of what we know about how aerobic exercise benefits the brain comes from animal models where we do see evidence of neurogenesis along with increases in growth factors," Liu-Ambrose said.

She pointed out that additional physiological mechanisms, such as inflammation, hormones, and cardiovascular function, are also likely to mediate the relationship between exercise and cognitive and brain health.

## Engaging Active Minds

Emerging findings suggest that engaging in regular physical activity isn't the only avenue to promoting cognitive health. Research conducted by APS Fellow Denise C. Park and others at the Center for Vital Longevity (University of Texas at Dallas) suggests that deep engagement in high-effort activities may have lasting effects on cognitive performance and function.

As evidence, Melissa Rundle, a staff scientist at the Center for Vital Longevity, presented data from the Synapse project, a 3-month lifestyle intervention aimed at engaging older adults in sustained activity.

Adults who were randomly assigned to high-effort engagement tasks participated in a mentally challenging activity (quilting or photography) for 15 hours per week, learning basic skills and progressing to more complex skills over time. Other adults were randomly assigned to low-effort engagement tasks, participating in activities that were not particularly cognitively demanding, such as reminiscing, games, and field trips for 15 hours per week.

The researchers measured baseline performance on a battery of cognitive and psychosocial measures and submitted a subset of participants to fMRI scans. The participants completed the same measures at the end of the intervention period and again at follow-up 1 year later.

Overall, participants who engaged in sustained, high-effort activities showed improvement over time compared with those in the low-effort group. Specifically, participants who trained on both quilting and photography showed improved processing speed on a digit comparison task, and those who received photography training or combined training showed improved episodic-memory performance on verbal recognition and learning tasks.

Importantly, those adults who learned photography skills showed sustained improvement in episodic memory performance when they were tested again 1 year later.

Findings suggest that resistance-based exercise improves brain function by protecting or enhancing underlying brain structure in particular ways. But more research is needed to probe mechanistic pathways.

Brain imaging data from a subset of participants suggest that the high-effort engagement also led to changes in functional brain activity. Following the intervention, the adults, who were scanned while performing a semantic classification task, showed relative changes in parietal and temporal areas associated with attentional networking and semantic networks. Some regions (intraparietal sulcus and middle temporal gyrus) showed increased modulation, while other regions (right inferior temporal gyrus, left mid cingulate, right precuneus) were newly recruited following the intervention.

At the 1-year follow-up, the high-engagement group showed sustained recruitment of the left mid cingulate relative to their peers.

The results suggest that learning and engaging with a cognitively demanding skill can result in benefits to cognitive performance and brain function over time.

## Connecting Through Fulfilling Roles

These bodies of research provide clear evidence that focusing on individual lifestyle factors, such as exercise and effortful cognitive activity, has benefits for health and well-being as we age. But focusing outward on social integration may also convey significant benefits.

The feeling that we have meaningful relationships with friends and family is central to social integration, but an equally important aspect is the feeling that we occupy meaningful roles in society, said sociologist Karl A. Pillemer (Cornell University). These roles often provide social contacts, but they also give us a social identity, status, and sense of purpose or meaning.

Paradoxically, threats to social integration increase as people age, "right when they need this kind of support most," he added.

At the same time that older adults start to experience profound social losses due to divorce, death, and geographical mobility, they also tend to transition out of full-time employment. This transition often entails losing the sense of meaning and purpose that comes with engagement at work.

"Our society does not make this easier," Pillemer noted. "Older workers are still left with few alternative pathways, such as phased retirement in the form of part-time or part-year work, and there's little assistance for developing a life plan for the ensuing potentially 3 decades or more of not being in the labor force."

The problem is fundamentally a societal one, but emerging research suggests that interventions focused on the roles that older adults occupy — especially those that engage older adults in meaningful volunteer positions — do yield noticeable benefits to well-being.

Pillemer and colleagues have been examining the effects of one such ongoing intervention program called RISE, or Retirees in Service to the Environment.

In earlier studies, the researchers found that environmental organizations tend to task older volunteers with low-engagement activities, such as stuffing envelopes, simply because they aren't prepared to offer more meaningful opportunities. With this in mind, RISE participants receive training that enables them to assert themselves and apply their expertise in their volunteer roles.

They also participate in educational sessions covering an array of environmental topics, studying everything from water quality to sources of alternative energy. Following this training, the participants devise and execute environmental stewardship projects, which have included designing a prescription drug return program and creating a community forum on pesticide use.

Data from 11 intervention cycles suggest positive effects, particularly for participants who had no previous environmental volunteering experience. These adults reported an increased sense that they were contributing to the next generation (known as generativity) and improved environmental knowledge. Importantly, they also reported an improved sense of social integration and self-efficacy as a result of their community involvement.

Pillemer noted that, as a society, we can't afford to ignore the wide-ranging consequences of social isolation, especially as the ranks of older adults continue to swell.

"We really have no alternative other than to address these issues," he said. "We can't promote successful aging, based on what we know, without also engaging in the promotion of social integration." ●

**-Anna Mikulak**

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# Teaching Statistics in the Age of Open Science

*By Kevin P. McIntyre*

The benefits of open science for promoting high-quality research are clear. Preregistration of hypotheses prevents *p*-hacking and other questionable research practices; open materials increase the fidelity of direct and conceptual replication studies; and open data allow for greater transparency in evaluating the strength of statistical evidence in support of a particular hypothesis. An unintended, but equally beneficial, outcome of the move toward open science is that those of us who teach statistics and research methods now have the ability to incorporate open data and materials into our courses.

Photo courtesy of of Trinity University

With a grant from the APS Teaching Fund, **Kevin P. McIntyre** has created a website that guides students through the reproduction of analyses in *Psychological Science* papers that include associated open data sets.

I came to this realization about a year ago while in a moment of panic. I needed to create an activity for the undergraduate statistics class I was teaching later that day, and I had no good ideas. Desperate for inspiration, I was flipping through the August 2015 issue of *Psychological Science* and found an interesting article by Ella L. James and colleagues examining whether computer games could be used to reduce the frequency of intrusive memories following a traumatic event. As I was considering the ways that I might convert this paper into an activity for my students, I happened to notice that it had an Open Data badge, indicating that the authors had made their data publically available using the Open Science Framework (osf.io). Rather than creating a fictitious data set that resembled the results reported in the original paper, as I had done in the past, I decided to give my students the actual data from the paper, along with an activity that would guide them through the reproduction of the analyses reported in the paper.

During the in-class activity, my students were enthusiastic and engaged. They seemed to connect with this activity in a way that they hadn't with my previous activities (which all used fictitious data). Working with real data helped my students see how our class was preparing them to conduct psychological research, and they found that analyzing real data was more challenging than analyzing fictitious data. Unlike textbook data sets, which often have one independent variable and one dependent variable, actual data sets have many variables, and researchers need to make difficult decisions about the best way to analyze that data. Having to think about these issues is likely to help students develop skills they can use when analyzing the data sets for their own projects.

Shortly after realizing the benefits of using open data for my own teaching, I thought that other people may want to use these open materials too. So I applied for, and received, a grant from the APS Fund for Teaching and Public Understanding of Psychological Science to create a website that provides teachers and students with papers published in *Psychological Science*, their associated open data sets (in SPSS and .csv formats), and activities to guide students through the reproduction of the analyses in the paper. The resulting website is called Open Stats Lab (openstatslab.com), and it launched in early 2017. The site is free to use, and SAGE Publications even makes the articles freely available, so that anyone, even those without a subscription to the journal, can use the activities. ●

**Kevin P. McIntyre** *is an Associate Professor in the Department of Psychology at Trinity University. His research examines how romantic relationships affect individuals' self-concepts, and he teaches undergraduate courses on statistics and research methods. For new activities and resources, you can follow @openstatslab on Twitter.*

Current Directions in Psychological SCIENCE

# Teaching Current Directions in Psychological Science

## Edited by C. Nathan DeWall and David G. Myers

*Aimed at integrating cutting-edge psychological science into the classroom, Teaching Current Directions in Psychological Science offers advice and how-to guidance about teaching a particular area of research or topic in psychological science that has been the focus of an article in the APS journal* Current Directions in Psychological Science. Current Directions *is a peer-reviewed bimonthly journal featuring reviews by leading experts covering all of scientific psychology and its applications and allowing readers to stay apprised of important developments across subfields beyond their areas of expertise. Its articles are written to be accessible to nonexperts, making them ideally suited for use in the classroom.*

Visit the column online for supplementary components, including classroom activities and demonstrations: www.psychologicalscience.org/teaching-current-directions.

Visit David G. Myers at his blog "Talk Psych" (www.talkpsych.com). Similar to the APS *Observer* column, the mission of his blog is to provide weekly updates on psychological science. Myers and DeWall also coauthor a suite of introductory psychology textbooks, including *Psychology* (*11th Ed.*), *Exploring Psychology* (*10th Ed.*), and *Psychology in Everyday Life* (*4th Ed.*).

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# How to Give a Gift: Shock and Awe or Calm and Useful?

## By C. Nathan DeWall

**Galak, J., Givi, J., & Williams, E. F. (2016). Why certain gifts are great to give but not to get: A framework for understanding errors in gift giving. *Current Directions in Psychological Science, 25*, 380–385.**

Some people are easier to shop for than others. They tell you exactly what they want, you purchase the gift, give it to them, and they use it. A simple transaction for a simple gift. But doesn't that gift exchange reek of boredom? It robs the recipient of surprise, delight, and amazement. Aren't those the basic ingredients of a good gift?

According to Jeff Galak, Julian Givi, and Elanor Williams (2016), the answer is a definitive "No." Gift givers make regular errors that cause others to dislike the gifts they receive. To use the language of behavioral economist Dan Ariely (2009), gift givers are predictably irrational. They focus on what happens the moment recipients receive their gift rather than on how much the recipient will use the gift. It's easier to see surprise and delight than to imagine a gift's everyday usefulness. The result is a gift-giving culture that encourages people to prize the exchange itself over a gift's long-term value.

People want high-quality, reasonably priced gifts that they expect and can use (Baskin, Wakslak, Trope, & Novemsky, 2014; Gino & Flynn, 2011; Flynn & Adams, 2009). It's far better to give your father three pairs of pants that he will wear to work than to give him a sweater emblazoned with the statement "Best Dad I've Ever Had"; he will appreciate the pants more than a sweater attuned to his unique sense of humor (Steffel & LeBoeuf, 2014).

You don't even need to give a gift that people can use right away. Your loved one may enjoy blending margaritas or kale-and-fruit smoothies. Rather than buy a $30 blender, give your loved one the same amount as a deposit on a top-of-the-line blender (Kupor, Flynn, & Norton, 2016). It hurts to delay gratification, but gift recipients would rather wait for a high-quality product than have a clunky version of the same thing immediately.

**C. Nathan DeWall** *is a professor of psychology at the University of Kentucky. His research interests include social acceptance and rejection, self-control, and aggression. DeWall can be contacted at nathan.dewall@uky.edu.*

Most students have experience giving and receiving gifts, but please be sensitive to economic, racial, and ethnic diversity that can affect your students' gift-giving and -receiving experiences. Don't assume that your students received a new car for their 16th birthday, celebrated their birthdays at Chuck E. Cheese's, or gave Christmas presents to all members of their extended families. Their families may have struggled financially to give any gifts, emphasized Bar and Bat Mitvah or Quinceañera ceremonies, or given their young relatives decorative dreidels. To bring this cutting-edge science into the classroom, students can complete the following activity.

## Giving Versus Receiving

People make gift-giving mistakes because they focus on the recipient's immediate reaction rather than a gift's usefulness. This activity aims to correct this error by having students take the perspective of the gift giver and the gift recipient. Students will read instructions for each perspective, presented on the following PowerPoint slides. Feel free to switch the order of each perspective.

**My Gift-Giving Situation**

Imagine that you're giving your best friend a gift. You spend countless hours making sure the gift:

- Will surprise your friend.
- Will be something the friend learns to use.
- Is something the friend never requested.
- Is expensive.
- Is unique.

If your gift meets these five criteria, how much do you think your friend will like your present? (*1=not at all* to *7=extremely*)

**My Gift-Receiving Situation**

Imagine that your best friend gives you a gift. Your friend spends countless hours making sure the gift:

- Will be useful.
- Will be easy to use.
- Is something you requested.
- Is not too pricey.
- Is something that you could use in a variety of ways, places, or locations (e.g., a Visa gift card).

If the gift you receive meets these five criteria, how much do you think you will like your present? (*1=not at all* to *7=extremely*)

Once students have responded to both situations, ask them to predict which gift they would rather receive (1=the gift their friend chose vs. 2=the gift they chose). Ask students to form pairs and spend 3 minutes discussing their responses. Encourage students to share their discussion information with the class. Remind them that the first situation lists gift characteristics that gift givers emphasize, whereas the second situation lists gift characteristics that gift recipients actually want. Why do students think many people commit these gift-giving errors? Do features of the situation or of someone's personality increase or decrease the likelihood of making these errors? How might researchers and companies prevent these errors?

The next time you find yourself fretting over giving the perfect gift, pause to take a reality check. Your angst may result from a focus on the moment the recipient receives the gift. If you don't know what your loved ones want, ask them. If you can't afford the top-of-the-line product, let your loved ones know and ask whether they would use a cheaper model or prefer a gift card toward the purchase. More than anything, put yourself in your loved ones' shoes. Get them something that they can use every day. Such a gift-giving exchange might seem boring, but it will reduce the chances your loved ones will think your gift stinks. ●

# Corralling the Drifting Mind

*By Gil Einstein and Cindi May*

**Szpunar, K. K. (2017). Directing the wandering mind. *Current Directions in Psychological Science, 26,* 40–44.**

What college student's mind has not wandered or zoned out during a lecture? It's tough to sustain attention during a 50-minute or 75-minute class. Today's students, who were raised on a steady diet of video games and social media, may find it especially challenging to stay on task.

Mind wandering occurs when our attention shifts away from the immediate external perceptual input (e.g., a professor's lecture) and drifts to self-generated mental activity (e.g., thinking of a humorous reply to a friend's text message). When it is not critical to maintain focus on the external environment, mind wandering can have positive consequences — such as reminding us of unfulfilled intentions or stimulating creative insights (Smallwood & Schooler, 2015). However, in other contexts such as driving, mind wandering comes at a cost and makes us less responsive to unexpected events. During lectures, mind wandering interferes with deep processing of course content (Smallwood & Schooler, 2015).

To give students an idea of how mind wandering is often measured, first assess the extent to which students' minds are drifting during one of your lecture periods. That is, stop your lecture three times (perhaps once near the beginning, middle, and end of your lecture) and ask students to indicate whether their minds were wandering at the moment you stopped them. If so, ask them whether they were thinking about something related to the lecture (e.g., the implications of a lecture concept) or unrelated to the lecture (e.g., thinking about dinner plans). In the following class period, you can assess how often students were mind wandering and have them consider their levels of zoning out relative to some of the following reported results.

**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. She 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.*

Using an experience-sampling procedure (e.g., sampling people's thoughts while they were engaged in daily activities), one study showed that we mind wander almost half of our waking time (Killingsworth & Gilbert, 2010).

Another experience-sampling study procedure estimated that we reminisce about a past event about 13 times per hour and think about an upcoming event about 17 times per hour (Gardner & Ascoli, 2015).

In the classroom, mind wandering occurs more often toward the latter part of the lecture (Lindquist & McLean, 2011).

Young adults report more mind wandering when they are bored, anxious, or tired (McVay, Kane, & Kwapil, 2009).

Although it is well-known that testing enhances memory for information that is retrieved, Karl Szpunar (2017) suggests that testing also reduces mind wandering. The general point is that students stay more focused on lecture content when they anticipate upcoming quizzes.

You can illustrate this point with Jing, Szpunar, and Schacter's (2016, Experiment 2) experiment, in which two groups of participants watched eight 5-minute segments of a videotaped lecture. All participants knew that they would receive a final test on the entire lecture, but the two groups differed on what they did after each of the first seven segments. The tested group freely recalled as much as they could from those segments, whereas the restudy group studied the lecture slides from those segments. After the critical eighth segment, both groups recalled as much as they could from that last segment. Interestingly, the results showed that the tested group recalled about 70% more idea units from the eighth segment than did the restudy group. Thus, anticipating that one might soon be tested on the lecture material enhances memory for that material. Moreover, students who expected to be tested regularly had fewer off-task mind wanderings and more relevant mind wanderings related to the lecture. As might be expected, the former type of mind wandering was associated with poor retention, whereas the latter type of mind wandering was associated with high retention.

Students might be asked to consider how professors can take advantage of this research to keep the minds of students focused on lectures. Szpunar suggests injecting low-stakes quizzes (perhaps using clickers) throughout the lecture or regularly requiring students to use what they are learning to solve problems. He also suggests that professors can encourage relevant mind wandering by relating course concepts to concrete and meaningful events in students' lives. Students might be asked to consider these approaches

and others (e.g., mindfulness training; Mrazek, Franklin, Phillips, Baird, & Schooler, 2013) for keeping the wandering mind on track. They might also evaluate these methods in light of their potential for fostering intrinsic motivation for learning. Given the learning benefits of staying on task, it is important to consider techniques that professors can use to corral the wandering mind.

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# The Benefits of Engaging in Collaborative Research Relationships

*By Joel G. Sprunger*

Collaborative working relationships have many benefits to offer, regardless of whether your career focuses on research, teaching, clinical practice, consultation, or any of the myriad other opportunities available to psychological scientists.

In 1969, Donald T. Campbell proposed a model of science that highlights the benefits of collaboration. This model argued that science is most effective when researchers with expert knowledge in different areas collaborate on a project of overlapping interest. The overlap allows for common ground, while the respective areas of expertise cover a greater "surface area" of the possible knowledge brought to bear on a specific question. Whether it is across labs in your program, across areas in your department, or across disciplines, there is much to be gained by bridging the divide between isolated research silos.

Because science and practice are enriched by collaboration among individuals with diverse but complementary perspectives, formal opportunities for collaboration are becoming increasingly common. For example, integrated and interdisciplinary treatment teams are now frequently seen in hospitals and health care centers. These teams feature collaboration among physicians, psychologists, social workers, nurses, and experts from various other fields. Academic institutions are also beginning to conduct "cluster hires" that draw experts from different backgrounds to collaborate on a shared research topics such as autism. Funding opportunities for collaborative research are also available from agencies such as the National Institutes of Health, the National Science Foundation, the Department of Veterans Affairs, and the Department of Defense. Being able to work effectively with professionals from many different backgrounds can therefore be a very marketable skill. Additionally, such collaborations will keep your research interests fresh and give you new angles for approaching your studies.Working with others outside of your academic comfort zone can also provide you with novel skills, theories, and methods that enrich your research and make you a more unique, innovative, and marketable professional. There are even funding opportunities available to support this type of collaboration and specialized training early in your career, such as the National Research Service Award F31 predoctoral and F32 postdoctoral fellowships.

Another benefit to collaborating with individuals outside of your lab is the opportunity to develop as a scholarly author. Writing with different collaborators and for different audiences requires you to communicate your ideas and methods more effectively than you might when writing for your peers and close colleagues. Collaborating with others, even within your own field, is therefore an opportunity to learn alternative ways of doing things. Often in graduate school, students become miniature versions of their advisors. Over time, they internalize and anticipate the feedback they will receive from their advisors and begin to make those adjustments automatically. This is a core learning experience and enables students to benefit from advisors' years of experience in a field. However, there may be other ways to frame a question, measure a construct, and conduct the thousand other scientific tasks that are just as good or even better than what you are already doing.

## Practical Advice for Finding Collaborative Opportunities

I have benefitted directly from research collaborations throughout my graduate training. Along the way, I have learned some valuable lessons that may be worth considering. First, it has been helpful to attend conference talks by authors unfamiliar to me who are doing work relevant to my area of research. Seeking out such talks may show you new ways to approach familiar questions and prompt critical evaluation of your own work. Second, I recommend going to talks from labs studying subjects unrelated to your academic comfort zone. Doing so may help you to appreciate how other areas conceptualize their questions, which methods they use to

**Joel G. Sprunger** *is a PhD candidate in clinical psychology at Purdue University. His research examines mechanisms and interventions for alcohol-facilitated aggression and intimate partner violence. He is currently completing his clinical internship at the University of Mississippi Medical Center.*

investigate these questions, and how they may approach interventions. Your exposure to these scholars may uncover opportunities for translation into your own work and represent an innovation that moves the science forward. For a personal example, as an alcohol-facilitated aggression researcher, my attendance at a talk about a mobile phone-based intervention for anxiety led me to question how something similar may be applicable to my area of study. Eventually, I pursued a predoctoral fellowship from the National Institute on Alcohol Abuse and Alcoholism to investigate just that. You never know when inspiration will strike.

If you are looking for a potential collaborator, it may benefit you to invite that person to help you learn more about their work. This can range from a one-time conversation after a conference talk to their commitment as a sponsor of your project. Depending on your goals, it may be ideal to ask them for help within their area of expertise to get you started on developing your own knowledge and skill set in that area. As in many relationships, effective communication will be your key to successful collaboration. It will be important to work together to establish the roles and responsibilities of each individual as well as to build an agreement about how authorship will be handled for major products. I also recommend working together to identify a realistic method for monitoring progress (e.g., meeting in person, emailing, or voice/video call), as well as the frequency of these contacts. This can help to identify problems early on and make problem-solving a team effort rather than a difficult conversation later on.

Most of all, do your best, have fun, and learn from your mistakes. Give yourself permission to be a student, to not have all the answers, and to seek to improve as you develop as a psychological scientist. While we all want our projects to be successful, that is secondary to what we stand to gain at this point in our careers. Much more important is that we keep moving forward: that our future research is better than our past research, even if neither one is perfect. Adding breadth to our scope, depth to our toolkit, and span to our scientific network (while enjoying the freedom of being a student) can help us solidify our trajectory as psychological scientists. ●

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**University of California, Santa Barbara Department of Psychological & Brain Sciences Assistant Professor, Neural Basis of Motivated Behavior**
The University of California, Santa Barbara (UCSB) has embarked on a multi-year, multi-departmental expansion in neuroscience and related areas of research. As part of this growth, the Department of Psychological and Brain Sciences invites applications for an Assistant Professor, tenure-track faculty position in the Neural Basis of Motivated Behavior. The appointed person will be expected to establish a strong neuroscience research program related to motivated behavior broadly defined utilizing one or many techniques including behavioral, physiological, and/or computational approaches. Applicants must have completed the requirements necessary to have a PhD conferred in Psychological and Brain Sciences or a related discipline by the time of appointment. Preferred candidates will have an outstanding record or promise of research accomplishment commensurate with this stage in their career, and a commitment to excellence in teaching and mentoring at the undergraduate and graduate levels. Prior experience in research related appointments such as Post-Doctoral Scholar is also desired. For primary consideration, the following application materials should be submitted online via UC Recruit at: http://apptrkr.com/1095767. For full consideration, applicants must submit the following materials: a curriculum vitae, a cover letter, a statement of past and future research interests, and a teaching statement. Applicants should also arrange for three letters of reference to be submitted on their behalf to UC Recruit. Questions can be directed to the Neural Basis of Motivated Behavior Search Chair, Tod E. Kippin via email at tod.kippin@psych.ucsb.edu. The anticipated start date for this position is July 1, 2018. The Department is especially interested in candidates who can contribute to the diversity and excellence of the academic community through research, teaching and service. The University of California is an Equal Opportunity/Affirmative Action Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, disability status, protected veteran status, or any other characteristic by law.

**University of California, Santa Barbara Department of Psychological & Brain Sciences Lecturer, Psychological and Brain Sciences**
The Department of Psychological and Brain Sciences at the University of California, Santa Barbara invites applications for the position of Lecturer with Potential for Security of Employment (LPSOE), the anticipated start date of this appointment is July 1, 2018. The LPSOE position is a permanent full-time faculty position designed for individuals who wish to focus their careers on teaching, professional activities, and university and community service and is viewed as a "security of employment-track" position. LPSOEs are members of the Academic Senate and have all the benefits of Senate membership, such as eligibility for faculty housing programs, medical insurance, and retirement benefits. LPSOEs are regularly evaluated for merit salary increases; evaluation for Security of Employment (which has the permanence of a tenured position) occurs within 8 years of initial appointment. Promotion within the LSOE series requires excellent teaching, professional activities, and service. The department is particularly interested in candidates who have expertise and strong evidence of teaching skills in statistics and research methods, and are dedicated to a career in undergraduate teaching and mentoring within a research environment. The successful candidate will play a key role in the department's educational mission. Teaching responsibilities will include undergraduate courses in statistics and research methods, and may also include quantitative courses at the graduate level as well as courses in the candidate's and department's areas of expertise. The candidate will also be asked to assume a leadership role in non-instructional undergraduate activities such as student advising, curriculum development, assessment of program learning outcomes, and working to improve the quality of the undergraduate major experience in the department. For primary consideration, applicants must have completed the requirements necessary to have a Ph.D. conferred in psychological, behavioral, and brain sciences or a related discipline by the time of appointment and have submitted all application materials by January 1, 2018 online via UC Recruit at: http://apptrkr.com/1103923
For full consideration, applicants must submit the following materials: a cover letter, a curriculum vitae, a teaching statement (describing teaching experience and approach), evidence of teaching effectiveness (including syllabi and teaching evaluations from prior courses, if available), and three letters of recommendation. The department is especially interested in candidates who can contribute to the diversity and excellence of the academic community through research, teaching, and service as appropriate to the position. The University of California is an Equal Opportunity/Affirmative Action Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, disability status, protected veteran status, or any other characteristic protected by law.

## GEORGIA

**Georgia State University Research on the Challenges of Acquiring Language & Literacy Post-Doctoral Research Fellowship**
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**Georgia State University Research on the Challenges of Acquiring Language & Literacy Tenure Track Assistant Professor**
Georgia State University (www.gsu.edu) invites applications for one anticipated tenure-track (rank of Assistant) faculty position to contribute to its funded initiative: Research on the Challenges of Acquiring Language and Literacy. This anticipated position is part of a major initiative to enhance existing strengths in language and literacy at Georgia State and continues our successful hiring in this area. The focus of this initiative is research with children and adults, with or without disabilities, who face challenges in acquiring language and literacy. In this university-funded initiative, more than 40 faculty members from 10 departments in the Colleges of Arts & Sciences and Education & Human Development come together to engage in interdisciplinary research. The initiative's faculty has a broad range of external support including two national research and development centers from the Institute of Education Sciences in the areas of deafness and adult literacy and grants from the National Institutes of Health including a learning disabilities research innovation hub on reading and reading disabilities of African American children and a program project on neurocognitive factors for children with developmental dyslexia. We encourage applicants whose program of research addresses basic or applied, conceptual or methodological issues concerning challenges in the acquisition of language and literacy with a particular interest in intervention research. Applicants must have a Ph.D. degree in special education, psychology, educational psychology, communication sciences and disorders or related areas. The appointment is open to all programs within the initiative. The successful applicant will be the individual who is prepared to take advantage of the interdisciplinary collaborative research opportunities available within the Language & Literacy Initiative, have a strong record of programmatic research, obtain external grant support, and have a commitment to and experience in the instruction of undergraduate and graduate students. We are particularly interested in applicants whose research programs complement other faculty within this initiative (www.researchlanglit.gsu.edu). Inquiries may be made to Dr. Rose A. Sevcik (rsevcik@gsu.edu) or Dr. Amy Lederberg (alederberg@gsu.edu). Submit curriculum vitae, a brief statement of professional goals and research interests, evidence related to teaching interests and effectiveness, and the names and three letters of reference either electronically to Keneé Stephens at kstephens@gsu.edu, with the subject line "Language & Literacy Faculty Search", or by mail to Attn. Ms. Keneé Stephens, Georgia State University, Language & Literacy Initiative, P.O. Box 5010, Atlanta, GA 30302-5010, USA. The review of applications will begin October 13, 2017 and will continue until the position is filled contingent on available funding. An offer of employment will be conditional on background verification. Georgia State University is an Equal Opportunity Employer and does not discriminate against applicants due to race, ethnicity, gender, veteran status, or on the basis of disability or any other federal, state or local protected class.

## INDIANA

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## NEW YORK

**Utica College Department of Psychology Assistant Professor of Psychology**
The Department of Psychology at Utica College invites applications for a full-time, tenure track position in Clinical Psychology beginning fall 2018. A Ph.D. in clinical Psychology with a background in child clinical or developmental psychopathology is required. The ideal candidate would be able to teach courses in introductory, developmental, psychological measurement and assessment, abnormal, clinical practicum, disability, and behavioral psychology courses. The candidate should possess, or be eligible, for New York State licensure in clinical psychology. Founded in 1946, Utica College is a private comprehensive institution distinguished for its integration of liberal and professional study. Our dedicated faculty and staff have built a tradition of excellence in teaching and learning with particular emphasis on providing individual attention to students. The College enrolls approximately 3,700 students – approximately 2,700 undergraduates and 1,000 graduate students. Utica College is located in an attractive, family-friendly area of upstate New York near the foothills of the Adirondacks offering easy access to a broad variety of recreational and cultural attractions. In deciding whether to apply for a position at Utica College, candidates are strongly encouraged to consider the UC mission and culture to help determine their potential success at http://www.utica.edu/instadvance/marketingcomm/about/. Our Mission and Values Statement includes a commitment to fostering diversity in background, perspective, and experience within an environment that is dedicated to the freedom of expression and the open sharing of ideas. At UC, diversity means that we are a community that represents a range of human experience and makes conscious choices to appreciate, respect, and learn from each other. Utica College actively seeks and welcomes applications from candidates with exceptional qualifications, particularly those with demonstrable commitments to a more inclusive society.To apply, submit a letter of application, CV, research statement, statement of teaching philosophy, and three references. Candidates are asked to submit a reflective statement about teaching. Since Utica College strives to be a diverse, yet inclusive, community, it is essential that you include in this statement a reflection on the kinds of experiences you have had, and the kinds of approaches you would take, teaching and working with a diverse student body. (For the definition of diversity that we use at Utica College, please see the following web page: http://www.utica.edu/instadvance/marketingcomm/about/diversity/aboutus.cfm.) Reflective statements that do not address diversity will be considered incomplete. All application materials must be submitted online at the following link: http://uc.peopleadmin.com/postings/2008 Applications will be accepted until December 15, 2017. References will be solicited to submit letters upon application. Utica College is an affirmative action/equal opportunity employer. We encourage applications from under-represented groups, including disabled and veterans as well as individuals who have experience with diverse populations.

## TENNESSEE

**Vanderbilt University Department of Psychology Tenure-Track Assistant Professor of Clinical Sciences**
The Clinical Psychology Program at Vanderbilt University in the Department of Psychology invites applications for a tenure track position as an Assistant Professor in clinical psychology. The Vanderbilt Clinical Psychology Program is internationally recognized for its strength in experimental psychopathology, affective science, intervention research, and clinical neuroscience. We seek an exceptional individual who has a strong record of creative, methodologically rigorous research that is conceptually driven, who has strong potential for obtaining extramural funding, and who has demonstrated the potential for effective teaching. A Ph.D. in the clinical sciences or related field is required, and completion of an APA-accredited internship is preferred but not required. We have strong collaborative relations with the Department of Psychiatry and other departments affiliated with the Vanderbilt University Medical Center. Institutional resources are outstanding and include the Vanderbilt Institute of Imaging Science, the Vanderbilt Brain Institute, and the John F. Kennedy Center for Research on Human Development. For information about the faculty, department, and interdisciplinary opportunities, please see. https://www.vanderbilt.edu/psychological_sciences/ Vanderbilt University has a strong institutional commitment to recruiting and retaining an academically and culturally diverse community of faculty. Minorities, women, individuals with disabilities, and members of other underrepresented groups, in particular, are encouraged to apply. Vanderbilt is an Equal Opportunity/ Affirmative Action employer. Applicants should submit a cover letter, curriculum vitae, up to 3 representative publications, a statement of research and teaching interests, and at least three letters of reference electronically via Interfolio at this link: http://apply.interfolio.com/44123 Review of applications will begin immediately. To receive full consideration, applications should arrive by December 1, 2017.

# ANNOUNCEMENTS

Send items to apsobserver@psychologicalscience.org

## GRANTS

**NIH Postdoctoral Research Fellowship Opportunity**
The University of Vermont's Center on Behavior and Health announces NIH postdoctoral research fellowship opportunities in its center of excellence for the study of substance abuse. Applicants must have completed their training in psychology, behavior analysis, cognitive neuroscience, or a related discipline and be US citizens or permanent residents. Trainees are selected on the basis of scholastic record and commitment to a career in substance abuse research. The appointment last for 2–3 years. Benefits include a stipend, medical insurance coverage, and travel funds supported by NIH Institutional Training Awards. For more information, visit med.uvm.edu/behaviorandhealth/careeropportunities.

**SRCD seeking applicants for 2018–2019 Federal Policy Fellowship**
The Society for Research in Child Development (SRCD) is seeking applicants for SRCD Federal Policy Fellowships for 2018–2019. There are two types of federal fellowships: Congressional and Executive Branch. Both types of fellowships provide researchers with exciting opportunities to come to Washington, DC, and use their research skills in child development to inform public policy. Fellows work as resident scholars within congressional or federal agency offices. Fellowships are full-time immersion experiences and run from September 1, 2018, through August 31, 2019. Following a 2-week science policy orientation program sponsored by the American Association for the Advancement of Science, fellows receive an orientation to child development and public policy. The SRCD Policy and Communications Staff facilitate the fellowship experience and are available as a resource throughout the year. Applicants must have a doctoral-level degree in a relevant discipline (e.g., PhD, MD, EdD), must demonstrate exceptional competence in an area of child development research, and must be a member of SRCD. Both early-career and more advanced professionals are encouraged to apply. The deadline to apply is December 15, 2017. For more information, visit srcd.org/policy-media/policy-fellowships-federal.

**Funding Opportunities for Research on Methodologies for STEM Education**
The National Science Foundation (NSF)'s Directorate for Education and Human Resources (EHR) Core Research Program has released a new letter detailing opportunities supporting psychological scientists and others who wish to study methodologies supporting inferences in STEM (science, technology, engineering, and math) education. Interested scientists should visit the NSF ECR Core Research Program site for more information on how to submit a grant proposal. Full proposals are due September 13, 2018; however, researchers can submit for conference grants as well as the EAGER funding mechanism (designed to support exploratory work) throughout the year. For more information, visit nsf.gov/funding.

**NSF Funding Opportunity for Leading International Research Experiences for US Students**
Recognizing the importance of globally educated scientists, the National Science Foundation has announced a new round of funding for its International Research Experiences for Students (IRES) program. This program allows investigators (e.g., psychological science faculty) to develop programs and support international travel for students via one of three "tracks." For IRES Sites, scientists submit a proposal to create a research theme that enables an experience for undergraduate or graduate students to collaborate with international partners on individual research projects. For Advanced Studies Institutes, scientists submit a proposal to develop an advanced studies institute, focused on educating advanced graduate students and addressing a spectrum within a broad area of a discipline. For New Concepts in International Graduate Experience, scientists submit a proposal for a novel approach to providing research or professional development experiences to graduate students. Applications for IRES Sites are due January 30, 2018, and applications for the two other tracks are due in February 2018. For more information, visit nsf.gov/funding.

## MEETINGS

**2018 Anxiety and Depression Conference**
April 5–8, 2018
Washington, DC, USA
adaa.org/resources-professionals/conference/registration

**2018 Cognitive Aging Conference**
May 3–6, 2018
Atlanta, Georgia, USA
cac.gatech.edu

**7th International Congress on Interpersonal Acceptance and Rejection**
May 15–18, 2018
Athens, Greece
isipar2018athens.panteion.gr

**30th APS Annual Convention**
May 24–27, 2018
San Francisco, California, USA
psychologicalscience.org/convention

**25th Annual RAND Summer Institute**
July 9–12, 2018
Santa Monica, California, USA
rand.org/labor/aging/rsi.html

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

# 'BOOSTING' BEHAVIOR CHANGE

## A CONVERSATION WITH RALPH HERTWIG

*Max Planck Institute for Human Development, Berlin*

*Behavioral scientists have made great strides convincing policymakers to embrace the concept of nudges — interventions designed to steer people's behavior in a preferable direction while preserving their freedom of choice. But APS Fellow Ralph Hertwig, Max Planck Institute for Human Development, Berlin, is proposing a second kind of intervention that he calls "boosts." In a new article in* Perspectives on Psychological Science, *Hertwig and philosophy professor Till Grune-Yanoff (Royal Institute of Technology in Stockholm) explain the differences between the two types of policy strategies. APS asked Hertwig about the "boost" concept.*

***We've heard about the "nudge" concept for years, and field studies have shown that nudges can work as policy interventions. What exactly is the difference between a nudge and a boost?***

Nudges aim to change people's behavior, while boosts aim to strengthen the underlying competence that enables a behavior. When a nudge is used as a policy intervention, it steers people's behavior in the direction that policy-makers deem desirable. That takes away some autonomy from the decision-maker. When a boost is applied, it is up to the decision-maker to decide whether to engage the new competence (e.g., a skill, routine, or heuristic), and to what end. And whereas nudges focus almost exclusively on the external choice architecture, boosts also target the person's cognitive repertoire. For example, a typical nudge would be to rearrange a school cafeteria such that healthy foods are at eye level and junk foods are harder to see (and reach). A boost would aim to give people the competence to choose healthy foods in diverse environments. An example of such a boost is a simple food rule such as Michael Pollan's "Don't eat anything your great-grandmother wouldn't recognize as food."

***How did you come up with the concept? What from the behavioral science literature supports this concept?***

Reading about the nudge framework, I came to realize that it reflected only a subset of what we've learned from behavioral science (predominantly from research done within the heuristics-and-biases research program) and neglected research that casts people's capacity to make decisions in a more favorable light — for example, the study of naturalistic decision-making, simple and ecologically rational heuristics, and the mind as an intuitive statistician. These research programs indicate that we don't need to give up on people's ability to make good decisions but rather can work with people to improve their own competencies.

***Are there some existing behavior-change models or field trials that you'd consider more of a boost than a nudge?***

Definitely. Consider motivational boosts. I'm a fan of Carol Dweck and her colleagues' research on growth-mindset interventions. They show that simple instructions that focus on students' beliefs about learning and intelligence can boost motivation and achievement. When students learn to apply such interventions on themselves, they acquire the ability to better regulate their motivation and exercise more self-control in important domains of their lives.

***Are there any of your own behaviors that you've been able to change through a boost?***

I consciously apply nudges to boost myself. For example, I manage my chocolate consumption by stashing my supply in remote corners of the kitchen that I can't easily reach. But I can only rearrange my "private" choice architecture in this smart, simple way because I understand the rationale behind this nudge. Letting people into the secrets behind some nudges is another way to help them develop the competence to design their choice environments according to their own preferences and goals. ●

Observer
Association for Psychological Science
1800 Massachusetts Ave, NW, Suite 402
Washington, DC 20036-1218 USA

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