

Science in San Francisco

Vol. 31, No. 6 • July/August 2018

# Observer



a publication of

**APS**

ASSOCIATION FOR  
PSYCHOLOGICAL SCIENCE

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**Arrested Development or  
Adaptive? The Adolescent  
and Self Control**

**BJ Casey**

*Department of Psychology  
Yale University, USA*



**Evolution of Emotions and  
Empathy in Primates**

**Frans B.M. de Waal**

*Department of Psychology,  
Emory University, USA and Utrecht  
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**The Brain in the Ecosystem:  
Cognition, Culture, and  
the Environment**

**Atsushi Iriki**

*Laboratory for Symbolic  
Cognitive Development  
RIKEN Brain Science Institute, Japan*

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## FEATURES

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### 2018 CONVENTION COVERAGE



#### Science Descends on San Francisco

It's been a beacon to gold miners, Beat writers, hippies, and techies. But in May the Golden Gate City called to psychological scientists and students from around the world as APS hosted its 30th Annual Convention. We've got all the highlights in this issue.

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# Observer

ISSN: 1050-4672

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Federal ID Number: 73-1345573

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## Fred Kavli Keynote Address

# Making and Remaking Memory

## *Lynn Nadel Explains the Role of the Hippocampus*

In the 1960s, research investigating the function of the hippocampus was in a state of crisis. The kinds of memory deficits that researchers had observed in the famous amnesic patient H.M. did not appear when they created analogous hippocampal lesions in rats and monkeys. How could the same structure play such a critical role in learning and memory in one species but not in others?

“This split led to chaos in the hippocampus world,” says APS Fellow Lynn Nadel of the University of Arizona. “I mean that seriously — there was this sense that ‘We have no idea what this structure is doing.’”

In his Fred Kavli Keynote Address at the 30th APS Annual Convention in San Francisco, Nadel discussed the paradigm-shifting advances he and colleagues have made, revealing just how much our understanding of the hippocampus has evolved in the last 50 years.

The turning point, said Nadel, was John O’Keefe’s discovery of “place cells,” neurons in the hippocampus that fire in response to specific places in the broader environment.

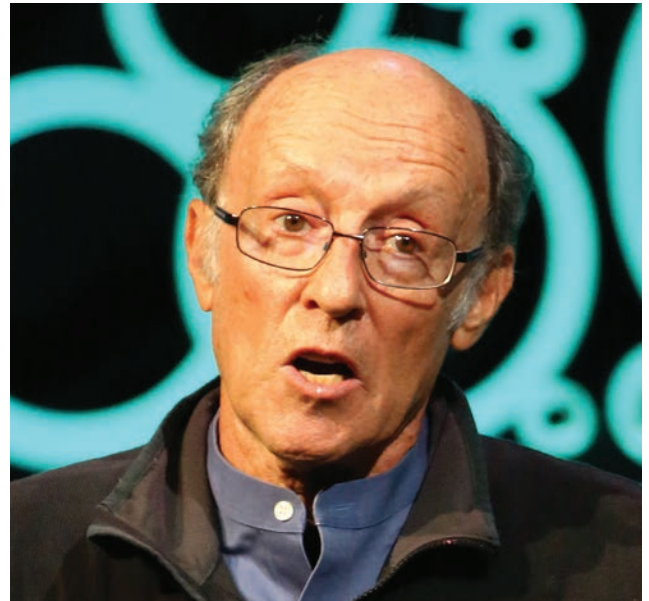
Nadel and O’Keefe were both working at University College London when O’Keefe brought over some exciting new data.

“This is like winning the scientific lottery,” Nadel observed. “Essentially, you work down the hall from somebody who makes a Nobel Prize-winning discovery and they ask you to join in — that doesn’t always happen.”

The two researchers began a collaboration that resulted in the now-seminal book *The Hippocampus as a Cognitive Map* and a 2006 Grawemeyer Award for Psychology. Nadel and O’Keefe theorized that place cells operated collectively to form a cognitive map of sorts — this cognitive map represents spatial information, but is fundamentally one of the brain’s memory systems. Each of these memory systems is associated with a particular brain area (or network) and specializes in processing and storing a particular type of information.

The purpose of the cognitive map, they theorized, is to represent information about space and episodes, enabling place-based strategies to predict what will happen in certain contexts.

The theory found confirmation in rodent studies, which showed that rats with hippocampal lesions were not able to recall



Lynn Nadel’s decades-long studies on the role of the hippocampus in memory formation and retrieval have shown that this region of the brain is activated whether someone is remembering an event from 3 days or 30 years ago.

the location of a food reward. In one experiment, for example, the researchers trained rats to receive water rewards either at specific locations or where a light was being shone. Rats with intact brains could remember and navigate to reward locations without difficulty, whereas rats with hippocampal lesions could only follow the light — they were incapable of learning about locations.

These findings suggested that the hippocampus is essential to learning and behavioral strategies that depend on a sense of place. Indeed, developmental research in humans and other slow-developing species has shown that this kind of place-based learning typically comes online as the hippocampus develops, emerging in humans around 18 to 24 months and maturing as late as ages 10 to 12.

The hippocampus is required for us to be able to access details from even the most distant or remote episodic

memories, as Nadel and APS Past Board Member Morris Moscovitch established in *multiple trace theory*. In several studies, Nadel, Moscovitch, and colleagues showed that the hippocampus is activated to the same degree whether participants are remembering a vivid event that happened 3 days ago or 30 years ago. These findings helped to upend the standard model of memory consolidation, which assumed that memories became independent of the hippocampus once they had been consolidated.

“This basic result — that the hippocampus is activated by remote memories as long as they’re interesting enough and have been preserved in that way — has been replicated by everybody. It’s no longer a question of whether this happens,” Nadel observed.

Importantly, multiple trace theory also asserts that the mere act of retrieving spatial, contextual, or episodic memories initiates new encoding that can alter the memory trace.

To Nadel and colleagues, it seemed like “a crazy way to build a memory system if every time you retrieve memory it’s in danger of being wiped out.” They hypothesized that there must be a functional advantage to a system that inherently makes memories so vulnerable to disruption. That advantage, they argued, is the ability to update our memories to accommodate new information.

The fact that our memories are labile means that they can expand and flex — they are “living beasts” that remain “adaptive and functional even as the world changes around us,” Nadel explained. Over time, Nadel and colleagues have illuminated some of the mechanisms that underlie this updating process.

In one study, Nadel and colleagues showed participants a blue basket containing multiple objects. They pulled the objects out of the basket one at a time and instructed the participants to try to remember all of the items. Two days later, some of the participants returned to the same room with the same experimenter, who asked them if they remembered what they had done there previously. Other participants were shown to a different room with a different experimenter. Participants in both groups then received a second set of objects to memorize.

The researchers hypothesized that bringing participants back to the same context would reactivate their memory for the previous session: Because the participants were learning the second list under similar conditions, they might end up erroneously associating some of those items with the first list. And that’s exactly what the data revealed. Participants who came back to the same room with the same experimenter misattributed several items from the second list, while those who came back to a different room with a different experimenter did not.

Additional findings indicated that the spatial context, not the experimenter or the reminder question, was the key component that triggered memory reactivation and updating in this way.

In another learning study, the researchers trained participants to associate objects, such as a saw or an alarm clock,

with the appropriate sounds. Two days later, the participants heard some of the sounds again as their brain activity was measured in a functional MRI (fMRI) scanner. They then learned a second list of words.

As expected, playing the sounds reactivated the memory of the first list and led participants to misattribute some of the items from the second list to the first one. But there was noticeable variation across participants — some showed significant misattribution, while others showed virtually none. The fMRI scans were revealing: Participants who showed relatively greater activity in the visual cortex while they heard the sounds tended to make fewer misattributions later.

“The more robustly they reactivated the memory, the less likely it was to be intruded upon by this new set of objects that they were learning,” Nadel explained.

Greater activity in the temporoparietal junction (TPJ) as participants learned the second list was also associated with fewer misattributions. The TPJ is thought to reflect processing of details, and these findings suggest that the level of detail “determines whether memories are going to get mixed together or whether they’re going to be kept apart,” Nadel explained.

In other words, when we reactivate a memory with high resolution, we can easily separate the details of the memory from the details of our current experience — the differences are clear. When we reactivate a memory with low resolution, however, details from the memory and details from current experience may become blurred together.

These findings have opened an entirely new frontier in memory research, and scientists are now beginning to examine whether it is possible to take a more deliberate and intentional approach to remaking memories. Nadel and others are also exploring the possibilities of memory updating during sleep, which is thought to be a period of spontaneous reactivation.

The exact parameters that determine the malleability of a memory remain unclear, but there is no longer any question that memory is inextricably linked with a sense of place. To illustrate this point, Nadel related a story about an encounter from his time in Prague as a postdoctoral student. On several occasions, he crossed paths with the same older man sitting on the bank of the Volta River. When Nadel eventually asked the man what he was thinking about, the man replied that he was thinking about his wife and how they always used to come to that spot on the river.

“He was telling me something very important about memory — that place is an indicator of memory, a signal for reactivating memories,” Nadel reflected many years later. • **–Anna Mikulak**

To watch the 2018 Fred Kavli Keynote Address, visit [www.psychologicalscience.org/r/kavli18](http://www.psychologicalscience.org/r/kavli18).





## Presidential Symposium

# A Grand Memory Tour

“Cicero described memory as the treasury and guardian of all things,” said APS President Suparna Rajaram (Stony Brook University, State University of New York) as she launched her Presidential Symposium at the 30th Annual APS Convention.

A distinguished group of speakers explored the science of memory from a variety of perspectives, crisscrossing fields within psychological science and taking the audience from neurons to nations in understanding the nature of memory.

### Hacking the Brain to Make Memories Stick

Can scientists use what they’ve learned from cognitive neuroscience to actually improve the way people remember? Charan Ranganath’s (University of California, Davis) work focuses on the ways that memories are prioritized; we don’t just remember everything we’ve ever encountered — we prioritize some memories for retention and we can hack and make use of them through the brain’s motivational circuitry.

As part of the presidential symposium, Ranganath described his lab’s development of “brain hacks” that not only help psychological scientists understand how memory works, but offer individuals some tips for improving their memories.

Ranganath and postdoctoral researcher Matthias Gruber hypothesized that curiosity may act on dopamine receptors in the brain similar to other forms of motivation, with the potential to improve memory. They had participants answer trivia questions while in an MRI scanner and found links among curiosity, activity in the hippocampus, and recall.

As might be expected, people were better at remembering information from questions that piqued their curiosity. People who were highly curious about a particular question were also better at remembering additional nonrelated information they weren’t curious about. Activity in the dopaminergic circuit, Ranganath noted, was stimulated only by questions that activated curiosity, not by answers that satisfied it. During this period of sustained activity, people were better at learning related information they weren’t curious about, and this effect was accompanied by greater activation of the hippocampus.

Another series of studies showed how recalling information about just a part of an event — in this case, a tour of a raptor bird

rescue center — can improve retrieval for the event as a whole. Just the act of going back to a photo of the experience and recalling one small piece of the event led to better memory for other parts of the event, and stronger recall over time.

Ideas and findings from both cognitive psychology and neuroscience can actually be used in education and other real-world settings to improve people’s memory, Ranganath explained.

### Effortless Memories

Involuntary autobiographical memories are a unique form of memory whereby past events come to our minds without any effort at retrieval; the memory simply pops up, seemingly on its own. Proust’s madeleine cookie (and the more than 4,000 pages of the novel this cookie ostensibly inspired) may be the most famous example of this type of memory.

Across several decades, APS Board Member Dorthe Berntsen (Aarhus University, Denmark) has studied this unique form of autobiographical memory. Her work has examined involuntary memory across the lifespan; in nonhuman animals; and as an important research topic for understanding the role of intrusive, involuntary memories in psychopathologies such as post-traumatic stress disorder (PTSD).

Across several studies, Berntsen and colleagues found involuntary autobiographical memories arise spontaneously in response to distinctive situational cues. This is adaptive and prevents us from being constantly flooded by these memories, she explained.

Voluntary and involuntary recall actually utilize the same underlying neurostructures, but differ in the degree of retrieval effort required. This has implications for populations with weakened or less-developed executive function, including nonhuman animals. To test the role of involuntary memory in apes, Berntsen and colleagues hid cardamom pellets, a novel and distinctive food the primates had never had before, in an enclosure for the apes to find. Even after nearly a year had passed, approximately 40% of the apes remembered the hiding place after coming across another cardamom pellet on the ground; much like Proust’s cookie, these



Charan Ranganath has developed a series of “brain hacks” that show connections among curiosity, hippocampal activity, and memory recall.



Across several studies, Dorthe Berntsen and colleagues have found that involuntary memories pop up spontaneously in response to distinctive situational cues.

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unusual treats prompted a memory of the past without the need for effortful retrieval.

Involuntary memories also play an important role in clinical disorders, perhaps most prominently in PTSD. Berntsen's research has challenged some of the assumptions about the role of intrusive involuntary memories in psychopathology. Involuntary memories do not seem to have privileged access to trauma and stressful events, as had previously been believed, but they leave little room for adaptive emotion regulation at the time of retrieval.



Qi Wang's examination of memory on a cultural level shows that autobiographical recall can adapt to constantly shifting macrolevel policies and even geopolitical politics.

"They are more emotionally overwhelming at the time of retrieval," she said, "so they take us by surprise and therefore may become very intrusive when we have negative content."

## Memory and Culture

Studies of cultural differences often reflect a static view of

culture as a characteristic largely defined by geography. But culture is anything but static, said APS Fellow Qi Wang (Cornell University).

A multilevel analysis approach reveals the dynamic process by which memory development unfolds in cultural contexts, she explained.

Wang's research shows how culture influences memory development across many different levels, from our day-to-day family interactions to macrolevel geopolitics. Her multilevel research examining individual, group, dyadic, situational, and temporal levels of analysis demonstrates how autobiographical memory can function as a complex, open system that is influenced by a wealth of shifting cultural factors. This includes everything from the language one is using at a particular moment to geopolitical policies that affect an entire nation.

Wang's research has shown that even in children as young as three years old, cultural self-goals influence ways of remembering, such as whether events are focused around an individual or a social unit. Parents also play a role in shaping what aspects of an experience are most important and hence imprinted in memory.

"The temporal level analysis suggests that even cultural values and ways of thinking can evolve and change as a result of larger societal-historical factors such as government policies," Wang explained. "Those changes can further lead to change in cultural priorities and goals, and the internalized self-goals individuals come to have, which further shape personal remembering."

China's one-child policy is an example of a national-level policy that fundamentally changed family structure and family practices. These shifts in family practices ultimately contribute to changes in how individuals remember; single children adopted a more individualistic pattern of memory compared with children raised with siblings.

"Autobiographical memory is influenced by the people we

interact with, the language we speak, the events taking place in our daily life, and also things happening remotely," Wang concluded.

## Who Won World War II?

APS Past President Henry L. "Roddy" Roediger, III (Washington University in St. Louis), became interested in the collective memory of World War II after contrasting popular portrayals of the war in America with the perceptions of people in other countries. He's found that remembrances of the war can vary remarkably nation to nation.

It's important, Roediger emphasized, not to confuse collective memory with history. Collective memories are representations of the past shared, to a greater or lesser degree, by members of a group. But just because a group shares a memory doesn't necessarily mean it's correct.

Research on collective memories about World War II indicate stark differences even among countries who fought on the same side. The standard American story about the war is that the United States joined the conflict after the Japanese bombed Pearl Harbor, with victory in Europe following 4 years later due largely to US efforts.

"Now, all well and good except that other countries, particularly Russia, have totally different narratives of the war, and that's what we wanted to try to get at in this study," Roediger explained.

His team surveyed 1,530 people from 11 countries, 8 of which fought on the Allied side, about their memories of World War II facts and events. When asked to rate their country's contribution to winning the

war, people of three of the countries surveyed thought that their country they deserved more than 50% of the credit. For example, Americans said 54% of the victory was due to the US contribution and English people said the United Kingdom was responsible for 51%. Yet, Russians gave the former Soviet Union around 75% of the credit (Russia also had by far the greatest casualty rate in the war). Furthermore, when asked to list the most important events of the war, people in the United States and United Kingdom provided lists that were almost nonoverlapping with those provided by Russians.

"We see that national schemas of the war, the way the war is remembered, is quite different, even among allies," Roediger concluded. Interestingly, other countries surveyed tended to provide the US and UK views of the war. • **-Alexandra Michel**



In a study of 1,530 participants from 11 countries, Henry L. "Roddy" Roediger, III, found that the collective memory of the second world war can vary remarkably from one nation to the next.

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## *Bring the Family Address*

# The Paradox of Diversity

*Jennifer Richeson Details Research on the Impact of Shifting Demographics*

**F**or years, the US Census has been projecting that racial minorities counted as one block will become the numerical majority by 2042. These reports have garnered a flood of coverage in the media, sparked commentary from pundits, and fueled the rhetoric of several recent political campaigns. But, as APS Past Board Member Jennifer Richeson explains, the census team tasked with crunching the numbers on race in America didn't fully anticipate how communicating their findings on this demographic shift might have unintended consequences for racial attitudes and race relations in the United States.

In her *Bring the Family Address* at the 30th APS Annual Convention, Richeson (Yale University) spoke about her award-winning research that illuminated how these consequences manifested in the United States. Her work on this and related topics has earned her a number of honors, including a MacArthur Genius Grant and a Guggenheim Fellowship.

In study after study, Richeson, largely in collaboration with Maureen Craig (New York University), has found that when projections of the majority–minority demographic shift are made salient, White American participants consistently respond with more negative attitudes about and toward other racial groups. Richeson also noted that both she and a number of other researchers have found that exposure to the majority–minority projections increase support for conservative political candidates and policies, including those that oppose diversity.

“Diversity is valuable, but it is also challenging. Thus, it is constantly being challenged across politics and policy,” Richeson explained.

This phenomenon extends well beyond the United States, Richeson emphasized. Research has shown similar reactions among White populations living in Canada, the United Kingdom, and Italy.

“This work suggests that diversity can be psychologically challenging, and indeed, we as psychologists should have known this,” Richeson said. “It’s an entirely old literature that has shown that increasing population sizes of minority groups can increase the tension between groups. This is old school.”



When confronted with projections of shifts in the racial make-up of the United States, White Americans show increased support for conservative political candidates and policies, Jennifer Richeson says.

Investigating people's reactions to a shift in demographics illuminates the broad psychological, social, and political implications of shifting demographics on our democracy, she added.

### **It's All About Status Threat**

At the heart of the paradox of diversity is this classic concept of group status threat: There is a sense that if an outgroup experiences an increase in status, “they” will usurp “our” position of influence in society. There is also a sense that cultural norms about what it means to be an American are at stake. An increase in diversity for some means the gradual erosion of Whiteness as an identity touchstone of what it means to be an American.

“There is a sense that American society will change. What it means to be an American will change, and Whites will lose,” Richeson explained. “If we know nothing else, social psychology has documented that social identity threat engenders intergroup tension. And that’s the mode we’re in right now nationally.”

This shift rightward occurs regardless of whether policies being considered are race-neutral or decidedly race-related and occurs across self-identified liberals, moderates, and conservatives alike. When people are made aware of the shifting racial

Continued on Page 13 ➡

# THANK YOU TO OUR EXHIBITORS



THE PSYCH STORE



Continued from Page 11

demographics, status threat is triggered for many Americans. That leads them to endorse more politically conservative ideology, support conservative policies, and favor conservative candidates. Psychological and political scientists have observed this effect time and time again, Richeson added.

Causal evidence for this finding utilized a third group of participants in an “assuaged threat” condition; these participants were shown an article about the impending racial shift. But they were also given additional “assuaging” information: Participants were told that “despite the demographic shift, racial groups’ relative positions in society are likely to remain the same.” White Americans in this assuaged threat condition were no more or less likely to support conservative ideology than those in the control condition.

“This is not the psychology of White people, it is a psychology of groups and relative position,” Richeson explained.

Indeed, White Americans aren’t the only people exposed to and aware of these shifting national demographics. Hispanics are the racial group with the largest share of population growth. So Richeson was interested in seeing whether non-Hispanic minorities would reveal similar responses to these demographic changes as found for White Americans. When Black and Asian American participants were exposed to information about shifting racial demographics that focused on Hispanic growth, they also showed increased support for conservative policy positions, a great tendency to personally identify as politically conservative, and even an increase in warmth toward Republicans.

### ‘Nothing Natural About It’

Scientists also need to be cognizant and skeptical of the way race has been defined in this majority–minority shift.

“We’re constructing race, and there’s nothing natural about it,” Richeson said, noting that the projected pace of the majority–minority shift depends almost entirely on who government demographers and others choose to categorize as White: “If

you checked off White — and anything else — on your Census form, you are likely to be categorized as not White.”

In Census projections where individuals who check off White and anything else are counted as Whites, Richeson added, the majority–minority shift moves back several decades.

“Nationally, we are at a crossroads,” she said. “For many in our nation, diversity is not consistent with democracy. They see diversity as something that is at odds with democracy, or at least certainly something that threatens democracy. The very question of what it means to be American is at stake, or at least it is now being contested.”

Richeson noted that one straightforward intervention against status threat is to remind people of the actual relative status of racial groups — the actual racial inequality — that persists across a number of domains in the United States. Most Americans are unaware of the true extent of their country’s racial inequity, she pointed out.

“I’d also like to suggest — just a little nod to us — that psychological science underlies much of the racial and political dynamics of our current moment in this increasingly diverse nation, so we need to be at the table,” Richeson concluded. “We need to be in communication with political scientists, economists, sociologists, demographers, and policy folks to really help us usher our nation in a direction where we’re both a democracy and diverse as opposed to the other possibility.”

To hear more about Richeson’s career, watch her 2016 interview for the APS video series *Inside the Psychologist’s Studio* at [www.psychologicalscience.org/video/inside-the-psychologists-studio-with-jennifer-richeson.html](http://www.psychologicalscience.org/video/inside-the-psychologists-studio-with-jennifer-richeson.html). • –Alexandra Michel

To watch the 2018 *Bring the Family Address*, visit [www.psychologicalscience.org/r/btf18](http://www.psychologicalscience.org/r/btf18).



# MINDS ON THE ROAD

AN APS BLOG ON THE SCIENCE OF WHAT’S DRIVING BEHAVIOR

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See page 28 for more information.

Poster:

The poster deadline has passed. The deadline was 15 June 2018. For more information please contact:

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*APS—David Myers Distinguished Lecture on the Science and Craft of Teaching Psychological Science*

# Preparing Teachers for the Unexpected

Daniel T. Willingham Calls for a Scientific-But-Practical Approach to Training Educators

**A** month into her first job at an elementary school, a newly minted teacher encountered a situation her Master's degree in education had never prepared her for: a 7-year-old girl who, seemingly at random, would get up out of her seat and start spinning in a corner of the classroom.

No one in any of her education classes had ever mentioned how to deal with a “spinner,” she told APS Fellow Daniel T. Willingham, a professor of psychology at the University of Virginia, and yet, when Willingham brought her predicament up with the other elementary school teachers he encountered through his work in educational psychology, they knew exactly the behavior she was talking about.

In general, up-and-coming teachers are receiving training that leaves them poorly prepared for unexpected experiences like this in real classrooms, Willingham said during his APS—David Myers Distinguished Lecture on the Science and Craft of Teaching Psychological Science at the 2018 APS Annual Convention in San Francisco.

“They are going to encounter problems that no one told them they were going to encounter,” he said, “so what do they do at those moments when they have this novel problem?”

Psychological science has been used to inform education in a number of ways, whether by inspiring classroom practices or evaluating existing practices, Willingham said.

**In a 2012 survey of the American Federation of Teachers, members' chief complaint was their training's heavy emphasis on theory over application.**

The problem lies in how psychological science is communicated to teachers, he explained.

“We're training future practitioners as if they're future researchers,” Willingham said. “It's interesting, so to some extent they like it ... but it's not really of very high utility.”

Most graduate programs require education majors to take a course in educational psychology or child development.



Rather than learning abstract theories, teachers are best equipped for the classroom when they understand empirical generalizations about the ways students think and behave, says **Daniel T. Willingham**.

Later on, the Praxis II licensing exam taken by most aspiring teachers in the United States expects test takers to have a basic understanding of how learning occurs, but that doesn't mean the knowledge sticks with them once they're out in the world as educators.

In a 2017 study led by Kelly Macdonald (University of Houston), more than 17,000 educators and members of the general public were asked to evaluate the accuracy of a series of “neuromyths” and factual information about the brain. When presented with common misconceptions about neuroscience (e.g., “classical music improves reasoning” and “dyslexia is seeing letters backwards”), educators accepted more than half of the myths as fact, suggesting that, on average, their grasp of psychological science was only 10% more accurate than that of the general public.

Teachers may not be retaining this information, Willingham said, because they're not putting it to use, and may even find it irrelevant to their work.

Continued on Page 17 

# 30TH APS ANNUAL CONVENTION

## 2018 APS James McKeen Cattell Fellows



**Richard E. Mayer**  
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Santa Barbara



**Janet Shibley Hyde**  
University of  
Wisconsin-Madison



**Richard A. Bryant**  
University of New South Wales  
Australia

## 2018 APS William James Fellows



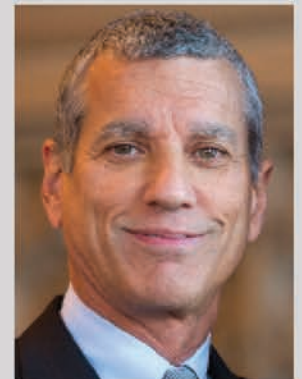
**Linda B. Smith**  
Indiana University  
Bloomington



**Barbara Landau**  
Johns Hopkins University



**Jonathan D. Cohen**  
Princeton University



**John T. Cacioppo**  
The University of Chicago

APS notes with great sadness  
the passing of APS Past President  
John T. Cacioppo in March 2018.

**Videos and coverage of these addresses will appear  
in upcoming issues of the *Observer***

More information on each award recipient can be found at  
[www.psychologicalscience.org/awards](http://www.psychologicalscience.org/awards)

Continued from Page 15

In a 2012 survey of the American Federation of Teachers, a labor union that serves more than 1 million educators in the United States, members' chief complaint was their training's heavy emphasis on theory over application. Most respondents said that their personal experiences, and the experiences of more senior teachers, in the classroom were of far more practical use to them than anything they were taught as students themselves.

## Basic Science Offers Solutions

Willingham said psychological scientists need to identify what they have to offer teachers rather than what they want teachers to know in classroom settings.

The three kinds of statements scientists make about the world — observations, theories, and epistemic assumptions — can be variably helpful to educators, he explained. While researchers need to be interested in all three, teachers should really only be concerned with observations that have risen to the level of empirical generalizations.

“Empirical generalizations are observations that not just have been replicated but have been shown to be highly regular across different contexts, across ages, across materials and so forth,” Willingham said, “and to me this is giving teachers information on what kids are generally like, what kids think, how kids behave, what their emotional life is like.”

“We’re training future practitioners as if they’re future researchers. It’s interesting ... but it’s not really of very high utility.”

Theories, on the other hand, tend to date back decades and to be abstract.

“If you look at a textbook of educational psychology what you’ll see is a few pages that describe Piaget’s Theory and then several pages after that describing all the ways in which we’ve had to modify our understanding,” Willingham explained. “It’s hard for me to see why that would be an especially valuable experience for teachers.”

Epistemic assumptions can also cause confusion, he adds. When psychological scientists say “learning is social,” for example, they mean that social factors should be considered when building a theory about learning. It’s easy for teachers, however, to interpret this kind of statement as meaning that children learn best in a social situation, when empirically that’s unsupported.

## Theories for Researchers Versus Theories for Practitioners

When it comes to creating a mental model of learners, Willingham said, teachers need one theory based on proven empirical generalizations so that they’re not

learning and memorizing something that could be disproven later.

“Theories for educators should be boring to researchers,” he said.

Willingham says psychological scientists need to identify what they have to offer teachers in classroom settings.

A researcher might explain memory, for example, as a complex multistep process involving concepts such as episodic buffering, visual semantics, and episodic long-term memory, whereas a more teacher-friendly model of memory should simply be comprehensible, he suggested.

Without greater follow through, however, even theories designed specifically for practitioners run the risk of being forgotten, Willingham cautioned. Students pursuing a Master’s in education usually take a course on educational psychology during their first semester of graduate school, and have little opportunity to revisit that content until they start studying for the licensing exam, he noted.

Standardizing the curriculum within a program to more consistently cover the psychological science of learning could help address this, but would require the cooperation of professors who are used to having full control over what’s taught in their own classrooms.

“If this is actually going to work, and psychological science is actually going to make a difference, this content needs to be revisited in future courses, and that’s a big ask,” Willingham said. “I don’t know about you all, but I’m pretty used to being the royalty in my classroom.”

Willingham concluded that translating theory into actionable information for teachers will require intermediaries with knowledge of both the classroom and the lab.

“It needs to be people who know the research literature very widely and very deeply and they also need to know classrooms,” he said. “If you’re a pure researcher and you haven’t spent time in classrooms, you don’t know what’s going to be useful to a teacher and you’re not going to know how these principles play out.” • —Kim Armstrong

This lecture was organized by the APS Fund for Teaching and Public Understanding of Psychological Science.

To watch the 2018 APS–David Myers Distinguished Lecture on the Science and Craft of Teaching Psychological Science, visit [www.psychologicalscience.org/r/education](http://www.psychologicalscience.org/r/education).





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# Recognizing Excellence

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# Call for Applications

## APS Fund for Teaching and Public Understanding of Psychological Science

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The APS Fund for Teaching and Public Understanding of Psychological Science (otherwise known as the APS Teaching Fund) invites applications for non-renewable grants up to \$5,000 to launch new projects.

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#### NEXT APPLICATION DEADLINE: OCTOBER 1

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Questions? Contact **Neil S. Lutsky, Committee Chair**  
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# SYMPOSIUM SUNDAY

The 30th APS Annual Convention hit the home stretch on May 27 with more than 40 symposia showcasing a range of research findings and discussion. Here is a sampling.

## How Neuroscience Can Save the World

Presenters took neuroscience beyond the medical and psychiatric realms to focus on how our understanding of the brain can address problems in society at large at “How Neuroscience Can Contribute to Solving Societal Problems,” a Sunday Symposium. The effects of lower socioeconomic status and chronic stress took center stage as **Allyson Mackey**, University of Pennsylvania, elaborated on how exposure to discrimination, crime, and toxins such as lead can change the brain. **Mirre Stallen** (left), Leiden University, the Netherlands, spoke on how incentives can be used to increase people’s intrinsic motivation to cooperate. Much of what psychological scientists already know can be used to inform policy related to the income achievement gap, the speakers said.



## Cultural Differences in Defining What’s Normal

Studies have found that Asians’ conceptions of norms are more detailed than those of North Americans, says **Krishna Savani**, Nanyang Business School, Singapore, during a Sunday Symposium on cross-cultural psychology.

## Big Data Methods for Health Research

Researchers based at the University of California, Merced, spoke on how the adoption of increasingly sophisticated statistical methods is allowing psychological scientists who study human health to better predict risk and health outcomes across massive sets of data. Psychiatric epidemiologist **Sidra Goldman-Mellor** discussed how she has used unique identifiers in longitudinal data from emergency department patients to identify teen suicide risk factors, such as living in certain neighborhoods or zip codes, which may not otherwise have been obvious. In a similar vein, **Gerald Martin-Gutierrez**, a fourth-year PhD student, explained how sociodemographic adjustment techniques can be used to tease out the health disparities between racial and ethnic groups in childhood and adolescence. “Sample proportions that approximate national statistics may not possess statistical power to detect racial and ethnic effects,” Martin-Gutierrez explained. “Therefore, studies may need to oversample minority groups to ensure adequate power to detect racial and ethnic effects.”



## The Visual and Affective Politics of Refugees

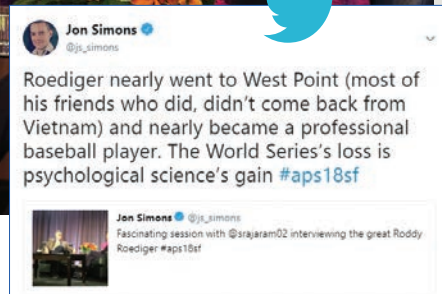
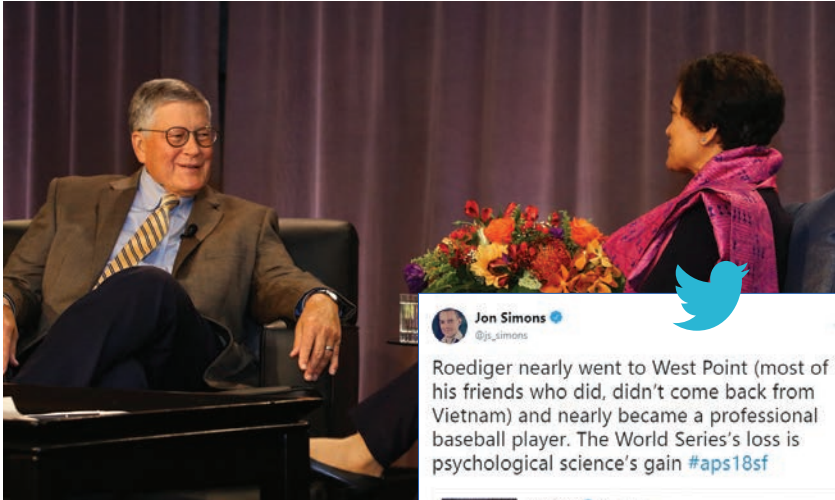
**Hannah Nam**, Stony Brook University, The State University of New York, gives a presentation on how the media portrayal of refugees affects the way they are viewed and treated by society at large. Nam and her fellow panelists examined multidisciplinary research about the dehumanization of immigrants.

## Poverty’s Impact on the Brain

Growing up in a low-income environment can not only shape your childhood but also your brain, influencing outcomes from academic achievement to mental health and substance abuse. In the case of alcohol consumption, said **Johnna Swartz** (left), University of California, Davis, exposure to the stressors associated with poverty can alter the way the ventral striatum and medial prefrontal cortex process reward. “The functioning of these same brain regions that seem to be associated with stress also seem to predict risk for different kinds of reward-related pathology,” Swartz said at a Sunday Symposium titled “Socioeconomic Disadvantage and Clinical, Neural, and Academic Outcomes Across Development.” Additional presenters outlined the ways in which these stressors can influence executive functioning and increase children’s risk of developing schizophrenia, bipolar disorder, and other conditions as adults.



# SCENES FROM SAN FRANCISCO



APS Past President **Henry L. "Roddy" Roediger, III**, discusses his life and career with APS President **Suparna Rajaram**, his former student, for a new addition to the "Inside the Psychologist's Studio" video series. The interview, conducted in front of a live audience, will be available for viewing on the APS website in late 2018.

APS James McKeen Cattell Fellow **Gary L. Wells**, Iowa State University, shares findings that challenge the image of eyewitness identification as inherently fallible. Wells' presentation was part of the *Psychological Science in the Public Interest (PSPi)* symposium, which covered a report on that subject of eyewitness identification that Wells coauthored with APS Fellow **John T. Wixted**, University of California, San Diego. Other presenters included APS Past President **Elizabeth F. Loftus**, University of California, Irvine; *PSPi* Editor and APS Fellow **Valerie F. Reyna**, Cornell University; the Hon. **Andre M. Davis**, US Court of Appeals for the Fourth Circuit (retired); and **David Angel**, Assistant District Attorney for Santa Clara County, California.







**Elana Safran** of the US Office of Evaluation Sciences (OES) discusses the ways that psychological science has been applied and evaluated in the federal government. OES is a team of social and behavioral researchers applying their knowledge and skills to help federal agencies improve their operations and service to the public.



APS President **Suparna Rajaram** (left) presents the APS Janet Taylor Spence Award for Transformative Early Career Contributions to APS Fellow **Catherine Hartley**, New York University, in recognition of her research focusing on the development and dynamics of the learning, memory, and decision-making processes that shape behavior. Other 2018 Spence Award winners include APS Fellows **Elliot T. Berkman**, University of Oregon; **Marc G. Berman**, The University of Chicago; **Kristin Laurin**, University of British Columbia, Canada; **Robb B. Rutledge**, University College London; and **Amrisha Vaish**, University of Virginia.

 **Bridget Callaghan**  
@BridgetCallagh3



Spontaneous blink rate predicts spontaneous recovery following instrumental extinction. Very neat work by Cate Hartley @NYUPsych #APS18sf



Psychological scientists working for Silicon Valley's biggest tech companies field a question from the audience in a special Q&A session about transitioning from academia to industry. Panelists included (from left) **Mengyang Cao**, **Jennifer Shukusky**, and **Eric Russell**, all of Facebook; **Carrie Ott-Holland** of Google; and **Sarah Semmel**, formerly of Twitter and now at business software company Stripe.



APS Mentor Award recipient **Lisa Feldman Barrett** chats with students during the annual "Champions of Psychological Science" event, which gives APS student affiliates the opportunity to meet with some of the field's most accomplished and recognized scientists.

# SCENES FROM SAN FRANCISCO



In a special event, APS Fellow **Nilanjana Dasgupta**, University of Massachusetts Amherst, talks about evidence-based interventions that help girls and women free themselves from the constraints of gender stereotypes as they relate to science and engineering.



More than 2,500 researchers and students presented posters at the 2018 convention.



Students can transfer the critical thinking developed in psychology courses to broader issues outside the classroom — even those that seem unrelated to psychological science, says APS Fellow **Bernard C. Beins**, Ithaca College, in his opening address at the APS-Society for the Teaching of Psychology Teaching Institute. More than 200 psychology instructors attended the annual event.



**Cathrine Jansson-Boyd**  
@Consumertrivia



Great talk by Bernard Beins on why our students need to be science literate. #aps18sf



APS Fellow **Daniel J. Simons**, Editor of the new APS journal *Advances in Methods and Practices in Psychological Science*, hosts a forum on appropriate and practical ways to make even the most sensitive research data publicly available in the age of open science.



Prominent neuroendocrinologist and APS Fellow **Robert M. Sapolsky**, Stanford University, drew a standing-room-only crowd to share his insights on understanding the biology behind some of the most destructive and most laudable behaviors among humans.



APS Past President **Robert W. Levenson** toots his saxophone while APS Fellow **Daniel J. Levitin** plucks and strums the strings during a celebratory concert to mark APS's 30th anniversary. Other band members included APS Fellow **Steve A. Sloman** on rhythm guitar, Disney Research scientist **Maarten W. Bos** on bass, **Bianca Levy** on drums, **Jessica Grahn** on keyboards, **Dale Boyle** on lead guitar and vocals, and **Carlos Reyes** on violin.



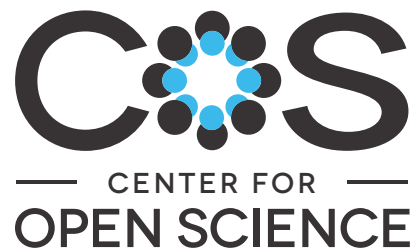
 **Suparna Rajaram**  
@srajaram02

@PsychScience The APS 2018 Convention in SF glittered with great science, all thanks to the outstanding scientists who brought their work and the amazing Program Committee! Thanks to ~4500 attendees and to everyone at APS! Suparna Rajaram, APS Immediate Past President @srajaram02

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# *Cross-Cutting Theme Program*

# Inequality Squares Up With Brain Function, Behavior

## *How Socioeconomic Status Shapes Development, Social Psychology, and Politics*

**W**hile inequality has existed throughout human history, the topic has gained center-stage status in the past several decades, from the Civil Rights movement of the 1960s to growing concerns about income disparities. Psychological scientists have provided insights into the drivers and perceptions of inequality and its consequences on our brains and behavior. Five researchers discussed these perspectives and discoveries in a Cross-Cutting Theme Program, “Science of Inequality,” at the 30th APS Annual Convention.

### **Keeping Kids Stimulated**

Katie A. McLaughlin, psychological scientist at the University of Washington, studies the academic achievement gap between children from families with low socioeconomic status (SES) and their peers from financially secure homes. Research suggests that cognitive stimulation could counteract the influence of poverty on academic performance. Access to books, toys, games, music, and interactions with parents all fall under the umbrella of cognitive stimulation, she suggested.

McLaughlin and her team went into the Seattle homes of 100 5-year-olds to study the relationship between cognitive stimulation and executive function, the mental control and self-regulation skills that are crucial to successful performance in school. In addition to observing home environments and surveying parents, the experimenters evaluated the children’s executive function using tasks to assess working memory, inhibitory control, and cognitive flexibility. They found that cognitive stimulation was strongly related to children’s executive function and explained SES-related differences in executive function.

A second study of 66 children ages 6 to 18 found that cognitive stimulation also related to success in school and provided evidence that a lack of cognitive stimulation leads to changes in the brain. McLaughlin explained the hypothesis: A child who grows up in an unstimulating environment will utilize fewer neuronal connections in regions of the brain that process complex cognitive and social inputs. Connections that aren’t utilized frequently will eventually be eliminated in a process called “synaptic pruning.” The children participated in mental tests as the researchers measured three indicators of brain structure and function — the thickness of the cortex, the integrity of white matter, and neural recruitment — during a working memory task using MRI. Children from

lower-SES families exhibited differences in these brain measures as well as lower executive functioning and academic achievement than children from higher-SES families. Critically, reduced cortical thickness in the fronto-parietal network — a brain network critical to executive function — among children from low-SES families was explained by differences in cognitive stimulation in children’s home environments.

Cognitive stimulation can be improved on a household and community-wide level, McLaughlin said: Parents may share more meals with their children and read them more books, and city, state, or national governments can help provide stimulating childcare or low-cost books, music, games, and toys. These efforts could ultimately help to close the achievement gap.

### **The Drug-Use Paradox in African Americans**

Research surrounding drug use in the African American community is informed by broader research into drug use in other populations, said Ezemanari M. Obasi, a professor at the University of Houston. African Americans are overexposed to known risk factors for drug use, but they initiate their drug use later in life compared with other Americans. They use drugs no more than other Americans, but they experience greater drug use morbidity and mortality compared with national averages. In order to understand this paradox, Obasi conducted an in-depth study of African Americans in metropolitan Houston, looking specifically at the links among stress, drug use, and levels of cortisol — the hormone associated with the stress response.

Obasi found that people experiencing chronic stress (e.g. racism, neighborhood violence, crime, and low family resources) showed blunted cortisol levels and responses. While a cortisol spike is a common response to short-term stress, cortisol that is low throughout the day and unresponsive to stressful situations is a symptom of unhealthy chronic stress and perhaps a compromised hormonal system.

The education gap, poverty, racism, underemployment, and violence all feed into stress and health outcomes, Obasi said. Exposure to crime and drug availability, as well as limited access to food and medical care, confer significant risks for both stress and substance use, he said. He also implored researchers to appreciate that local and cultural factors may differ among groups and places.

Continued on Page 29 

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Symposium Deadline - 15 September \*

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## Poverty and the Brain

Poverty is one of the most powerful risk factors for poor developmental outcomes. It is associated with depression and various externalizing behaviors. While the ways poverty influences development are multifaceted, APS Board Member Deanna M. Barch, a psychological scientist at Washington University in St. Louis, focuses on poverty's relationships to family stress, its impacts on parenting, and the way that parenting might in turn influence brain development.



**Deanna M. Barch** conducted a study that followed approximately 200 children from preschool through late adolescence and found that poverty at a young age negatively affects hippocampal volume in later life.

In addition to the brain changes McLaughlin noted among low-income children, Barch also discussed reduced hippocampus volumes — the brain areas associated with emotion and stress reactivity — that have been consistently found in impoverished kids.

The NIH-supported Preschool Depression Study measured income-to-needs, maternal support, and breast feeding — three factors thought to influence brain development. Researchers followed approximately 200 children from preschool through late adolescence. This study's results suggested that poverty in preschool predicts hippocampal

volume when children reach school age. Further, in comparative research, researchers have found that maternal care in rats leads to gene expression in the hippocampus responsible for growth in that area and future parental behaviors in pups. Barch also found that the relationship between poverty and hippocampal volume in humans was mediated by parenting behavior.

Connectivity between brain regions also shows responses to early life stress and deprivation. In depression, the connectivity between these regions is altered. This pathway may partially explain how early adversity contributes to depression risk. In the Preschool Depression Study, children from financially stable backgrounds were less likely to suffer depression at school age and were more likely to have patterns of brain connectivity associated with good emotion regulation than were low-SES kids.

Barch suggested that financial support for parents, educational augmentation, and family support should be studied to try to alter these adverse outcomes.

## Social Comparison Increases Risk-Taking

Poverty alone can't account for poor health and social outcomes, according to APS Fellow Keith Payne of University of North Carolina at Chapel Hill. Payne found that while national income per person doesn't match well with an index of health and social problems, income inequality does. The index included in a 2009 study covered infant mortality, math and literacy scores, homicides, imprisonment, teen births, obesity, and social mobility,

among other metrics. Norway, for example, scored relatively close to the United States on average income, but showed comparatively lower income inequality and fewer social and health problems. This same pattern — lower income inequality correlates with fewer social and health problems — was observed across 21 countries with sufficient income, health, and social data. This relationship holds when looking at health and social problems on a state-by-state basis within the United States.

Payne suspects that social comparisons and inequality can lead to bad decisions and risky behavior. He described a study in which participants were told they were about to play a gambling game to earn money. Half of the participants were told that the range of typical winnings each round was fairly narrow — between 40 and 60 cents. This was the “low-inequality” condition because there is a small range between the “richest” and “poorest.” The “high-inequality” participants were told that average winnings were between about 5 cents to \$1 each round. The average winnings for each condition were the same.

First, players were asked how much money they would need to win in the game to be satisfied. Then, while playing the game, participants could choose between low-risk options — an 80% chance they would win 25 cents, for example — or high-risk options such as a 20% chance they would win \$1. In the end, people in the high-inequality conditions said they would need more money to be happy with their outcome. This suggests that they were comparing themselves with the richest members of the group rather than with the poorest. During the game, players in the high-inequality group chose the riskier decisions.

Payne also looked at Internet searches to explore whether indicators of risky behaviors and inequality were correlated in the world outside of the lab. He found that search terms related to financial risk-taking (e.g. “lottery,” “pay-day loan”), sexual risk-taking (e.g. “morning after pill,” “STD test”), and drug and alcohol risk (e.g. “how to pass a drug test,” “how to get rid of a hangover”) were more prominent in states with higher income inequality, suggesting that social comparisons have real-life implications on a large scale, regardless of median income.

## Do Democracies React to Inequality?

Are the effects of inequality on policy preferences reflected in patterns of taxation and redistribution in the United States and Europe? It stands to reason that periods of inequality would lead to support for taxes on the rich. And while, historically, periods of low inequality follow periods of high taxation, the opposite



According to a study conducted across 21 countries, says **Keith Payne**, lower income inequality correlates with fewer social and health problems — including infant mortality, math and literacy scores, homicides, imprisonment, teen births, obesity, and social mobility.

is not true, said Stanford University political scientist Kenneth Scheve. This suggests that democratic systems are not very responsive to inequality. Many accounts of this fact have focused on why democracies may fail to represent preferences for greater redistribution in an era of higher inequality. But it is, of course, also possible that redistributive policy opinions do not respond to inequality as is often assumed.

To explore this possibility, Scheve and colleagues Michael Bechtel and Roman Liesch observed how individual study participants behaved with one another, and how they supported policies related to wealth redistribution, in financially inequitable situations.

In both Germany and the United States, the researchers ran experiments with a total of almost 5,000 participants. They gave out \$100 in gift cards to pairs of people. A participant would either get \$25 (with their partner receiving \$75), \$50 (partner getting \$50), or \$75 (\$25 to their partner). Then the participant would get a chance to give or take money from their partner.

When participants were given more, they generally gave to their less fortunate partner. They didn't, however, give enough to make the two partners equal. On average, those who were assigned \$75 gave up about \$9 to their partner. Those given \$25 and the chance to take money from their partner also took about \$9 on average.

Only 30% of participants were categorized as “equalizers” in all cases, making sure both parties ended with about the same amount whether they were given \$75 or \$25.

The behavior within the two-person interaction predicted support for society-wide policies. Those who opted to equalize pairs by taking from “rich” partners also supported raising taxes on wealthy members of society, while nonequalizers did not. Those who equalized by giving close to \$25 of their \$75 tended to oppose welfare spending cuts.

Overall, this would suggest that democracies may not implement redistributive policies in response to rising inequality because there range of responses people have to inequality may prevent a societal consensus. • **–Joe Dawson**



While it may seem intuitive that income inequality would affect policy decisions on a national level, **Kenneth Scheve** has found that democratic systems are not very responsive to such disparities.

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# Cross-Cutting Theme Program

## Getting A Grip on Reality

### *Our Ability to Distinguish the Real from the Imagined*

**H**ow do we learn to distinguish what's real from our own internally generated thoughts, imaginings, and dreams? In a now-seminal 1981 paper, APS Fellow Marcia K. Johnson described a framework for reality monitoring — our ability to differentiate between externally derived perceptions and our own internally derived thoughts.

In a Cross-Cutting Theme Program at the 30th APS Annual Convention in San Francisco, an integrative panel of researchers from fields ranging from cognitive neuroscience to political psychology discussed how reality monitoring research illuminates our understanding of everything from liberal rage at Donald Trump's Twitter account to predictions about adolescents' risk for psychosis.

#### The Brain, the Real, and the Imagined

APS Fellow Jon S. Simons (University of Cambridge, United Kingdom) has spent over a decade investigating “reality monitoring,” the brain's ability to distinguish internal experiences (imagination, dreams, thoughts), from externally generated events that occur in the real world.



**Jon S. Simons** has conducted studies showing that variation in a specific brain region, the paracingulate sulcus, may be a potential biomarker for the development of schizophrenia or psychosis in adolescents.

Across several studies, Simons and colleagues have noted the brain regions that appear to play a prominent role in our ability to determine reality from imagination: for example, a region at the forefront of the brain called the anterior prefrontal cortex and, in particular, a specific brain fold within that region, the paracingulate sulcus (PCS). Neuroimaging studies have shown that activity and connections in these regions may be a useful tool for determining an individual's proclivity for misattributing imagined internal details for real external ones.

These findings are particularly relevant for understanding clinical conditions. Simons has found that, in study participants with a diagnosis of schizophrenia, the anterior prefrontal region shows reduced activity, and this seems to

be associated with reduced reality monitoring performance. Variability in the PCS brain fold can distinguish people who hallucinate from those who do not, which might in the future provide promise as a potential biomarker for subsequent development of schizophrenia or psychosis.

#### Is This the Real Life? Is This Just Fantasy?

It's not just our memories that influence our imaginations but that our imaginations can also influence how we remember, APS Fellow Donna Rose Addis (The University of Auckland, New Zealand) explained. Though we may think of memory and imagination as completely separate processes, they may not be so different after all.

Initially, scientists hypothesized that episodic memory underpins our ability to imagine future events. The details we flexibly extract from distinct memories can be borrowed and rebuilt into our imaginations of future events. Nearly a decade after initially proposing this constructive episodic simulation hypothesis, Addis thinks it's time to re-evaluate this theory a bit.

“Memories are built from perceptual elements of experience, but they are also infused with the products of our imagination, and sometimes so much so that it can be quite hard to know where it is that memory ends and imagination begins,” Addis explained.

Addis would like to see a shift from conceptualizing memory as the basis of imagination to seeing memory as another form of simulation — one that doesn't differ fundamentally from imaginations of future and past events.

#### Discerning Children

Conventional wisdom holds that young children confuse or mix fantasy with reality. But across 20 years of research, APS Fellow Jacqueline D. Woolley (The Uni-



Memory and imagination may not be as distinct from one another as psychological scientists once believed, notes **Donna Rose Addis** — indeed, they are so connected that they can be hard to tell apart.

versity of Texas at Austin) has found that children actually separate fact from fiction better than we recognize. “Children often are quite skeptical and they use and evaluate evidence using all kinds of tools that are fairly scientific and analytic,” Woolley said.



Despite being taught myths, such as the existence of Santa Claus, that may lead them to confuse fantasy and reality, children are quite adept at separating fact from fiction, says **Jacqueline D. Woolley**.

We don’t make it easy for children to learn the distinction between reality and fantasy, Woolley noted. Parents teach children about fantastical beings like Santa Claus, and children read about and observe characters performing impossible events in books and on TV. Yet Woolley’s research shows that even young children master numerous skills that allow them to reason about reality, including using the fit between their knowledge of the real world and new information they may encounter to make reality status judgments.

Thus, although deciding whether something is real or fantastical might seem a simple judgment, Woolley argues, behind it lies a complex set of operations that can tell us a lot about how we think in general.

## Your Reality or Mine?

Though we may be experiencing the same events, our perceptions and interpretations of our shared realities may be very different. As a timely example of this phenomenon, APS Fellow John T. Jost (New York University) uses liberal reactions to Donald Trump and a rising swell of global support for authoritarianism.

In some all-important ways, liberals and conservatives differ psychologically, contributing to the polarization now sweeping the United States, Jost explained.

Research in political psychology has shown that highly threatening historical periods can be accompanied by an increase in authoritarianism in the general population. Extreme right-wing movements — such as those that have emerged in the United States, Israel, and Europe — thrive under conditions of threat and anxiety.

Jost says Trump drives liberals “crazy” largely because liberal values avoid elevating one set of values over others, even when one of those ideologies is seen as abhorrent. Conservative philosophy (and psychology) does not

struggle with the same internal contradictions. This “liberal conundrum” simply cannot be resolved ideologically, philosophically, or psychologically, Jost said.

Serving as a panel discussant, APS Fellow Steven Sloman (Brown University) elaborated on how our perceptions of knowledge — particularly when it comes to politics and policy — don’t always line up with the reality.

“People can’t know everything there is to know, so we rely on others. There’s a division of cognitive labor,” Sloman explained. “When we talk about our individual beliefs, we’re really talking about our communal beliefs, and the question of what it is we know becomes a question of who we trust.”



**John T. Jost** says President Trump upsets liberals because their values avoid elevating one set of values over others. Conservative philosophy (and psychology) does not struggle with the same internal contradictions.

“Memories are built from perceptual elements of experience, but they are also infused with the products of our imagination.”

—Donna Rose Addis

We have a false sense of personal knowledge called “the illusion of explanatory depth.” Our sense of understanding is a kind of hallucination, Sloman explained, that emerges from the belief in others’ understanding.

Someone may believe they understand something about an issue simply because the people around them think they understand it, because the people around them think they understand it, and so on. An entire community can end up with a strong sense of understanding even though no one has any real understanding at all. ● —**Alexandra Michel**

## Reference

Jost, J., & Hunyady, O. (2018, March 22). “Mass Psychology in the Age of Trump.” Retrieved from <https://democracyjournal.org/magazine/48/mass-psychology-in-the-age-of-trump/>

## Cross-Cutting Theme Program

# How Technology Shapes Thoughts, Feelings, and Actions

## *Psychological Scientists Examine How We Think About Smartphones, Virtual Reality, and the Internet*

**T**echnology is not just changing the way people interact with the world, it's also changing the way scientists study human behavior and the brain. New technologies are allowing psychological scientists to take their research out of the lab and “into the wild,” where theories can be tested in real-world settings.

San Francisco is a world-famous hub of technology and a fitting locale for a symposium on research on tech and the human experience. In a Cross-Cutting Theme Program at the 30th APS Annual Convention, speakers presented interdisciplinary work on the ways technology shapes learning, attention, behavior, and our social lives from childhood through old age.

### Technology Meets Neuroscience

Technology is allowing neuroscientist Melina Uncapher of University of California, San Francisco (UCSF), to take her science out of the brain-imaging lab and directly to the classrooms she studies.

“It’s not feasible, obviously, to bring an MRI scanner into every classroom, but we can start to use some of these mobile technologies ... to map the cognitive domains of the brain,” Uncapher explained.

The Neuroscape Center at UCSF has developed “ACE,” a tablet-based cognitive assessment, which has allowed Uncapher and her colleagues to study executive function within a group of more than 1,000 elementary and middle school students across nine different Bay Area schools. These customized Neuroscape video games use adaptive algorithms to adjust the level of game difficulty, allowing researchers to use the same exact cognitive tasks for children of all ages across experiments and time. Critically, this allows high-precision, high-dimensional measurement of cognition across development.

Uncapher and her team hope to use a technique called joint modeling to create models around the behavioral measures they’ve obtained and how they relate to brain structure and function. The researchers’ ultimate goal is to create a sustainable cognitive enhancement loop whereby each child receives the most effective intervention (technology-mediated or curriculum-based) to enhance their executive functioning — ultimately improving their learning, education, and life outcomes.

### Aging and Tech

Rates of technology use ranging from smart phones to the Internet are significantly lower among older adults compared with younger generations, University of Miami psychological scientist Sara J. Czaja pointed out. Czaja’s field-based research demonstrates that technology potentially can help older adults avoid social isolation, as well as improve their access to vital medical care and services.

In a trial, Czaja and colleagues provided video phones to people caring for someone with dementia. The research team found that providing caregivers with access to interventions such as counseling via the phone was linked to several positive outcomes, including a reduced sense of burden.

“The thing they liked the most were the support groups, because they didn’t have to leave their home to participate in the groups, which is problematic for many caregivers,” Czaja explained.

Czaja also is working with Prism, a custom software system designed for use in the homes of socially isolated older adults. After a year-long trial, not only did participants learn how to use a computer, they felt less isolated and reported increased emotional well-being.

Access to technology helps many people overcome logistic challenges, facilitating access to services, socialization, and information, Czaja said.

### Virtual Humans

Jonathan Gratch’s lab at the University of Southern California builds strikingly realistic and interactive virtual humans



Sara J. Czaja has conducted field-based research showing that technology can help older adults avoid social isolation and improve their access to medical services.

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reminiscent of the sentient robots on the television show “Westworld.”

“We build these social artifacts that have embodiment of various kinds and then we have people interact with those systems and examine the theoretical implications,” Gratch, a professor of computer science and psychology, explained.

These virtual humans have been used to help people learn negotiation tactics, to tell the stories of Holocaust survivors, and to help people disclose symptoms that could lead to the diagnosis of a stigmatized mental illness.

Building on social psychological theory, Gratch’s team trained a machine-learning algorithm to mimic the verbal and nonverbal habits of nonjudgmental listeners. Using a camera and microphone, this social agent also tracked relevant social information from their human partner’s voice, facial expressions, posture, and gestures in real time. A recently replicated study found that, in responding to questions related to symptoms of post-traumatic stress disorder, people disclosed twice as much intimate information to the virtual listener compared with what could be gleaned from an official online disclosure form.

### Your Attention Please

It’s hard to believe that the Internet has been in popular use for little more than 2 decades, psychological scientist Gloria Mark (University of California, Irvine) said. But what does it mean for our lives, and specifically our attention spans, to be immersed in digital media day in and day out?

“Working in a digital environment leads people to be polychronic, which means working on multiple tasks at the

same time,” Mark, an expert on human–computer interaction, explained. “Human beings can’t literally work on multiple tasks at the same time, but what they generally do is switch their attention very rapidly between different sources of info.”

In a study observing the behavior of information workers, Mark and colleagues found that on the job people had a median attention duration of about 40 seconds. That is, they spent around 40 seconds on any given window on their computer before switching to something else.

Additional work on interruptions suggests that rather than being driven to distraction by external sources such as digital notifications or a busybody colleague, we seem to be conditioned to work with a short attention duration.

“One of the most surprising things about this research,” Mark said, “is that people interrupt themselves almost as much as they get interrupted from externals.” • -Alexandra Michel



In his lab, **Jonathan Gratch** creates interactive virtual humans that have been used to teach people negotiation tactics, tell the stories of Holocaust survivors, and help people disclose symptoms of mental illness.



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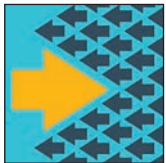
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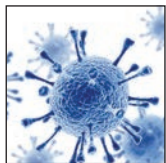
**Changing Minds and Behaviours Throughout Society: The Greatest Challenge of Our Times**

**Tom Beckman**, *Global Head of Creative, Prime Public Relations, Sweden*

**Enny Das**, *Centre for Language Studies Faculty of Arts, Radboud University Nijmegen, The Netherlands*

**Stephen Fleming**, *Wellcome Trust Centre for Neuroimaging, University College London, United Kingdom*

**Susan Michie**, *Centre for Behaviour Change, University College London, United Kingdom*



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

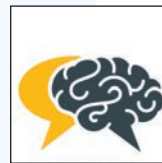
**Alyssa N. Crittenden**, *Department of Anthropology, University of Nevada, Las Vegas, USA*

**Robert Dantzer**, *Department of Symptom Research, Division of Internal Medicine, The University of Texas MD Anderson Cancer Center, USA*

**Jane A. Foster**, *Department of Psychiatry & Behavioural Neurosciences, McMaster University, Canada*

**William P. Hanage**, *Department of Epidemiology, Harvard University, USA*

**Mats Lekander**, *Department of Clinical Neuroscience, Karolinska Institutet, Sweden*



**The Consequences of the Evolution of Language on the Mind**

**Lera Boroditsky**, *Department of Cognitive Science, University of California, San Diego, USA*

**José Morais**, *Centre for Research in Cognition & Neurosciences, Université Libre de Bruxelles, Belgium*

**Jennie E. Pyers**, *Department of Psychology, Wellesley College, USA*

**Alexandra Rosati**, *Department of Psychology, University of Michigan, USA*



**Collective Emotions in Cooperation and Conflict**

**Emma Cohen**, *Wadham College, University of Oxford, United Kingdom*

**Paolo Gerbaudo**, *Department of Digital Humanities, King's College London, United Kingdom*

**Eran Halperin**, *School of Psychology, Interdisciplinary Center, Israel*

**Bernard Rimé**, *Faculté de psychologie et des sciences de l'éducation, Université catholique de Louvain, Belgium*

**Christian von Scheve**, *Institute of Sociology, Freie Universität Berlin, Germany*

**Dan Zahavi**, *Department of Media, Cognition and Communication, University of Copenhagen, Denmark*



## Human Culture: What Is It and How Does It Work?

**Marcus Feldman**, *Department of Biology, Stanford University, USA*

**Miriam N. Haidle**, *The Role of Culture in Early Expansions of Humans, Heidelberg Academy of Sciences and Humanities, Germany*

**Henrike Moll**, *Department of Psychology, University of Southern California, USA*

**Dan Sperber**, *Institut Jean Nicod, France*



## How Changing Our Bodies Changes Our Selves

**Henrik Ehrsson**, *Department of Neuroscience, Karolinska Institutet, Sweden*

**Carolyn Mair**, *Psychology for Fashion, United Kingdom*

**Nichola Rumsey**, *Centre for Appearance Research, University of the West of England, Bristol, United Kingdom*

**Melvyn Slater**, *Department of Clinical Psychology and Psychobiology, Universitat de Barcelona, Spain*



## From the Heart to the Eye: Interoception and Awareness

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

**Martin Paulus**, *Laureate Institute for Brain Research, USA*

**Catherine Tallon-Baudry**, *Laboratoire de Neurosciences Cognitives, Ecole Normale Supérieure, France*

**Manos Tsakiris**, *Department of Psychology, Royal Holloway, University of London, United Kingdom*



## Studying Perception: Is It Worth It?

**Ned Block**, *Department of Philosophy, New York University, USA*

**John McGann**, *Department of Psychology, Rutgers, The State University of New Jersey, USA*

**Yael Niv**, *Princeton Neuroscience Institute and Department of Psychology, Princeton University, USA*

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### About the Estes Fund

The Estes Fund was established to honor William K. and Katherine W. Estes. Bill Estes was a giant in the fields of learning and mathematical psychology, a recipient of the National Medal of Science, and the founding editor of the journal *Psychological Science*, for which Kay Estes served as founding managing editor. The Estes Fund is jointly overseen by the Association for Psychological Science and the Psychonomic Society.



# Student Events Offer Advice on Graduate School, Publishing, and More

By *Ryan C. Thompson*

**T**he APS Student Caucus (APSSC) organized several exciting and informative events for student members from across the globe at the 2018 APS Annual Convention in San Francisco. The events included networking opportunities, award addresses, and sponsored sessions detailing how to succeed in graduate school, find and keep jobs in a competitive professional marketplace, and become a published journal author.

APSSC programming began with a networking social on Thursday evening attended by more than 250 students. The following morning, the Naked Truth sessions began with “The Naked Truth Part I: Getting Into Graduate School,” designed to provide students with information about navigating the graduate school application process. Preparation and intentionality throughout the application process were overarching themes. Alexis Briant (Virginia Polytechnic Institute and State University) chaired this session with a panel of five current graduate students: Debielle T. Jacques (University of Rochester), Christal N. Davis (University of Missouri), Timothy J. Valshtein (New York University), Akshay Jagadeesh (Stanford University), and Meghan Vinograd (University of California, Los Angeles). The panel discussed their personal and professional backgrounds, which cut across clinical, developmental, neuroscientific, and social psychological science. Each of the panelists emphasized the importance of narrowing one’s research focus and population of interest, finding a mentor, preparing for the GRE and interviews, and determining program fit.

Emily Hokett (Georgia Institute of Technology) led the next session, “The Naked Truth Part II: Surviving Graduate School,” aimed at offering advice about how to maximize the graduate school experience and propel students into productive careers. Danica Kulibert (Tulane University), Monica Acevedo-Molina (University of Arizona), Lauren Drandoroff (Rosalind University of Medicine and Science), and William J. Brady (New York University) comprised the panel of current graduate students who discussed how to avoid early career pitfalls; maintain balance in a demanding work environment; manage relationships with peers, supervisors, and professors; and market oneself as a professional. Brady in particular underscored the need for students



During “The Naked Truth Part II: Surviving Graduate School,” graduate students (from left) **William J. Brady** (New York University), **Monica Acevedo-Molina** (University of Arizona), **Lauren Drandoroff** (Rosalind University of Medicine and Science), and **Danica Kulibert** (Tulane University) addressed everything from early-career pitfalls to marketing oneself as a professional.

to use their time efficiently and intelligently, especially when it comes to finding time to write. Acevedo-Molina stressed the importance of speaking up and questioning unclear guidelines and expectations.

A group of researchers, scientists, and leaders fielded questions about entering the job market during the third session, “The Naked Truth Part III: Navigating the Job Market after Graduate School,” chaired by Carolyn Davies (Institute of Living/Hartford Hospital). The panel included Andrea N. Niles (University of California, Los Angeles; University of California, San Francisco), Kristin Laurin (University of British Columbia, Canada), Jennie K. Grammer (University of California, Los Angeles), and Aidan G. C. Wright (University of Pittsburgh). Throughout the session, panelists detailed how they succeeded during their own job searches along with what to consider when deciding between industry, the public sector, and academia. Moreover, the speakers discussed the nuances of required experience and expectations for the interview and application timeline. Students were advised to identify their research “story” and to incorporate past experiences and future goals to support that “story.”

The fourth session of the day, “The Naked Truth IV: You’re Working Where?,” was led by incoming APSSC President Amy M. Rapp (University of California, Los Angeles) and focused on the benefits and challenges of taking a career outside of academia. Sarah Laszlo (Neuroscience Lead, Google X), Ryan Stoll (Founder, Obeo Wellbeing), David V. Yokum (Director, The Lab @ DC in the Executive Office of the Mayor of Washington, DC), and Cameron Sepah (Entrepreneur, Residence at Trinity

Ventures) described their range of career choices and experiences, such as leaving a tenured professorship and starting a company. The conversation was full of conflicting opinions, heated debates, and valuable advice from psychological scientists influencing both top companies and government offices.

“How to Get Published: Guidance from Journal Editors” was the final session on Friday, moderated by outgoing APSSC President Amy Heard Egbert (Loyola University, Chicago) and was one of the most highly attended APSSC student events throughout the conference.

The panel included three prominent research scientists and journal editors: Jonathan B. Freeman (New York University; Associate Editor, *Personality & Social Psychology Bulletin*), Ute-Christine Klehe (Justus-Liebig-Universität Giessen, Germany; Past Editor, *Journal of Applied Psychology*), and APS Board Member Deanna M. Barch (Washington University in St. Louis; Associate Editor, *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*). The panelists discussed how to create a list of targeted journals, what delays and stops an article’s path to publication, how to professionally engage with reviewers and editors, when to speak up about an article rejection, and the importance of integrating reviewer and editor feedback.

Saturday’s APSSC student event programming began with the RISE Research Award and Student Research Award addresses. The RISE Research Award recognizes outstanding student research on

socially and economically underrepresented populations, all of whom were selected by a panel of their peers. This award aims to increase awareness of the need for diverse perspectives in psychological science. Winners included Andrew Joseph Paladino (The University of Memphis), Jiyoung Park (Yonsei University), Alesha D. Bond (Georgia State University), and Alyssa Palmer (University of Minnesota). The Student Research Award addresses, led by Brooke Slawinski (Michigan State University), acknowledged outstanding APS student member research with the opportunity to present their projects at the APS Convention. This year’s winners were Minseo Kim (Central Michigan University), Maria St. Pierre (Walter Reed Army Institute of Research), Fang Hong (Boston University), and Alice Kathmandu (Stanford University).

The final APSSC event at the 2018 APS Convention, “Champions of Psychological Science,” was chaired by APS William James Fellow Barbara Landau (Johns Hopkins University). This annual and highly anticipated event offers students the opportunity to learn from and network with some of the world’s foremost psychological researchers and innovators. This year’s champions were APS President-Elect Lisa Feldman Barrett (Northeastern University), APS William James Cattell Fellows Richard E. Mayer (University of California, Santa Barbara) and Janet Shibley Hyde (University of Wisconsin-Madison), and APS Fellow Keith Payne (University of North Carolina at Chapel Hill). Students spoke with and received advice from the researchers in an informal setting. ●

## CALL FOR NOMINATIONS APS RISING STARS

DEADLINE: SEPTEMBER 30, 2018

The APS Rising Star designation recognizes outstanding psychological scientists in the earliest stages of their post-PhD research careers. Nominations will be evaluated based on the following criteria:

- significant publications
- significant recognitions
- significant discoveries, methodological innovations, or theoretical or empirical contributions
- work with potentially broad impact

Eligibility for the 2018 nomination period is limited to individuals who received a PhD between January 1, 2013 and December 31, 2017.

Nominations Process: Each nomination must be supported by two APS Members, one of whom must be an APS Fellow. For information on submitting nominations, please visit:

[www.psychologicalscience.org/rising-stars](http://www.psychologicalscience.org/rising-stars)

# ANNOUNCEMENTS

Send items to [apsobserver@psychologicalscience.org](mailto:apsobserver@psychologicalscience.org)

## GRANTS

### Special Initiative on Integrating Biology and Social Science Knowledge Accepting Inquiries

The Russell Sage Foundation (RSF) has launched a special initiative, Integrating Biology and Social Science Knowledge, which will capitalize on new theories, concepts, and data from the biological sciences to advance research in RSF core programs in the future of work, social inequality, and behavioral economics. The initiative is intended to integrate biology into social science models and social and environmental circumstances into biological models in order to further the understanding of how environments influence behaviors and socioeconomic outcomes. A detailed letter of inquiry must precede a full proposal. The deadline to apply is August 20, 2018, for proposals on the future of work, social inequality, and behavioral economics. For more information and to apply, visit the Russell Sage Foundation website or contact Program Director James Wilson at [programs@rsage.org](mailto:programs@rsage.org).

### NIH Funding Announcements for Methodology Research

The National Institutes of Health (NIH) has released a new funding opportunity announcement designed to support research on methodology and measurement in the behavioral and social sciences. NIH is supporting research on methodology and measurement via the R21 grant mechanism, which is a 2-year grant for exploratory or developmental research providing up to \$275,000 in direct support. NIH encourages applicants to contact one of the many NIH Institutes or Centers participating in the funding announcement which matches the research focus of the proposed project before applying for funding.

Applicants are encouraged to propose research projects that address methodological issues related to: interdisciplinary, multimethod, and multilevel approaches that integrate with biomedical, physical, or computational science research; integrating, mining, and modeling data in combination with genetic, epigenetic, biomarker, and imaging data, research in and on diverse populations, the study of sensitive health-related behaviors in the context of healthcare, the social environment, and policy; and ethics in research. NIH encourages applicants to contact one of the many NIH Institutes or Centers participating in the funding announcement that matches the research focus of the proposed project before applying for funding. The participating Institutes and Centers are: Office of Behavioral and Social Sciences Research, National Cancer Institute, National Eye Institute, National Institute on Aging, National Institute on Alcohol Abuse and Alcoholism, National Institute on Deafness and Other Communication Disorders, and the National Center for Complementary and Integrative Health. Applications are due October 16, 2018.

### NAS Mirzayan Fellowship for Grad Students and Early Career Scientists

Graduate students and those within five years of receiving their PhD with an interest in learning about science and technology policy in Washington, DC, are encouraged to apply for the Christine Mirzayan Science & Technology Policy Graduate Fellowship Program at the National Academies of Sciences, Engineering, and Medicine. The Mirzayan Fellowship provides early-career researchers with a \$9,000 stipend to support 12 weeks living and working with the Academies in Washington, DC from January 22 through April 12, 2019. Interested individuals should apply by September 7, 2018.

### NIH Funding for High-Priority Behavioral and Social Research Networks

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

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

## MEETINGS

### 41st Annual National Institute on the Teaching of Psychology

January 3–6, 2019

St. Pete Beach, Florida, USA

[nitop.org](http://nitop.org)

### 3rd International Convention of Psychological Science

Organized by the Association for Psychological Science

7–9 March 2019

Paris, France

[icps2019.org](http://icps2019.org)

### 31st APS Annual Convention

May 23–26, 2019

Washington, DC

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