

THE SOCIAL DYNAMICS OF
ENVIRONMENTALISM

THE 2019
APS YEAR IN REVIEW

A DOCTORAL STUDENT'S
SUMMER IN TECH

Observer

VOL. 33, NO. 1 • JANUARY 2020

Sparking Change

Science lights the way

PAGE 28

a publication of
aps
ASSOCIATION FOR
PSYCHOLOGICAL SCIENCE

www.psychologicalscience.org/observer

Observer

ISSN: 1050-4672

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Federal ID Number: 73-1345573

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Take an Aisle Seat

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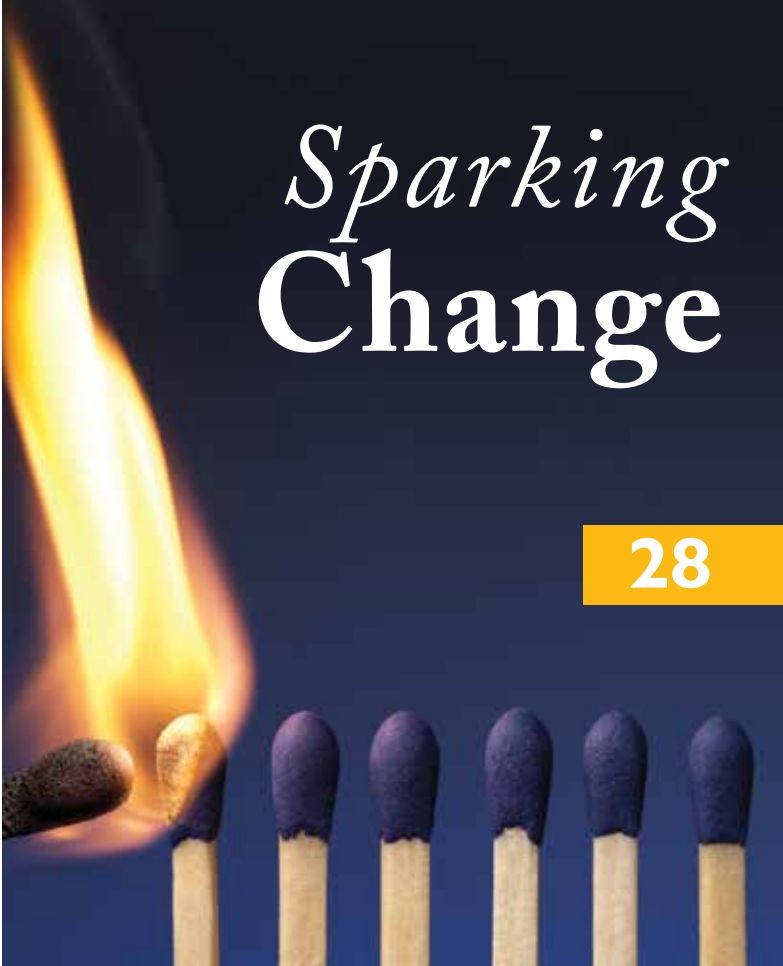
Our willingness to engage in proenvironmental activities reflects how we identify as a part of our social and political ecosystems, as well as how we envision our relationship with science itself.

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Sparking Change

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NEW YEAR, NEW LOOK!

The *Observer* is starting 2020 with a fresh new design. Changes include a simpler and more inviting layout and a greater focus on helping APS members keep up with the association and each other. Please share your feedback — and your submissions for articles— via email at apsobserver@psychologicalscience.org.

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Feeling Like “Part of the Family” Could Lead Employees to Take Advantage

Using communal “we” language in organizational codes of conduct can contribute to the perception that dishonesty will go unpunished. (*Minds for Business*)



The Human Brain

Psychological scientists are devoting an increasing amount of their research time examining the role of the brain in human behavior, emotion, and cognitive health. (*Research Topic*)



Games Can Be Good — When You Play for the Right Reasons

The effects of playing video games on well-being seem to depend largely on why and how an individual chooses to partake. (*Observations*)



Children’s Preference for Learning Could Help Create Curious AI

The strategies children use to search for rewards in their environment could be used to create more sophisticated forms of artificial intelligence. (*Observations*)



Opioid Addiction

The heavy shadow of opioid addiction continues to hover over the United States and other parts of the world. Psychological scientists are facilitating our understanding of opioid dependence and identifying new treatment options. (*Research Topic*)



Networking May Not Pay Off for Everyone

Professionals who invest time in networking against their personal preferences may find that their work suffers as a result, a study suggests. (*Minds for Business*)

NOMINATION DEADLINE

FEBRUARY 29, 2020

The Grawemeyer Awards

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The Nomination Process

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

Nominations Must Include:

- A one-page to two-page letter of nomination, in English, identifying the specific idea being nominated and delineating the reasons why the idea merits the award, based on the criteria above.
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2020 Robert Plomin

TAKE AN AISLE SEAT

By Lisa Feldman Barrett
 APS President

Much of the world has just ushered in a new year and is busily engaged in the aspirational activity called “making New Year’s resolutions.” You know, exercise more and eat less. Save more and spend less. And so, I humbly submit for your consideration, “discuss more and dismiss less”—that is, let’s engage with our critics.

Behind every scientific success you can always find a chorus of critics, and I mean that in a good way. Part of the scientific process is dealing with conflicting data and mistakes, and yet it’s tempting to find fault with the criticisms or even the critics themselves. But if you accept that being wrong is an opportunity for discovery, then the people who disagree with you should become your best friends. Call it “taking an aisle seat,” after the metaphor of reaching across the political aisle. If you’re sitting near the aisle, it’s easier to reach across. Your view of the world depends on where you sit.

Recently, four of my colleagues and I camped out for more than 2 years, tents and all, in the middle of the aisle to ask whether there are universal facial expressions of emotion. My partners in crime were APS Fellows Ralph Adolphs, a neuroscientist at the California Institute of Technology, and Seth Pollack, a developmental psychologist at the University of Wisconsin-Madison; Northeastern University computer scientist Stacy Marsella; and computer vision engineer Aleix Martinez of The Ohio State University. We did not know each other well and began with deeply opposing views on

this topic. We were aware that we were wading into a contentious debate that has raged for more than a century. And we were facing a mountain of research findings that are open to multiple interpretations. My compatriots and I did our best to set aside the ideological battle, focus on the data, and attempt to come to consensus on what the data show.

We decided at the outset not to forge an adversarial collaboration. Our goal wasn’t for one of us to be right, but for all of us to understand how things work. To stay loyal to that goal, we agreed on a few ground rules at the outset:

- **Define success up front.** We formally agreed on the criteria for universal facial expressions of emotion. The evidence needed to show reliability (e.g., when angry, do people scowl often enough for scowls to be considered a reliable signal of anger?), specificity (e.g., are scowls specific to anger, or do they frequently have other meanings?), and generalizability (across different ages, cultures, and so on).
- **Keep the goal in sight.** We agreed to examine the evidence and determine the soundest interpretation of the data, not try to win a debate.
- **Follow the data.** To settle disagreements, we’d reread the source material and seek additional evidence from other sources.
- **Be curious.** We reminded ourselves explicitly in the moments of greatest frustration to be curious instead of defensive. This was sometimes *very* difficult.
- **Mistakes are part of the job.** Each time one of us admitted we were wrong about something, even something we’d published, the rest of us agreed that we’d offer the person our admiration and esteem for their bravery.
- **Have a contingency plan.** In the end, if we didn’t come to agreement on what the data show, we would write companion papers in dialogue with one another. At the very least, we’d create a good example for readers about how science works.

Once we began the project, we stewed in the evidence for 6 months before we wrote even a single bullet point. Our initial draft manuscript was like ink ➡



Lisa Feldman Barrett is a University Distinguished Professor of Psychology at Northeastern University, with appointments at Harvard Medical School and Massachusetts General Hospital. Her research focuses on human emotions and how they are constructed. She is the author of the book *How Emotions Are Made: The Secret Life of the Brain* and is a recipient of the APS Mentor Award, the National Institutes of Health Director’s Pioneer Award, and a 2019 Guggenheim Fellowship. Barrett can be contacted at lfeldmanbarrett@psychologicalscience.org.

soup, with each scientist using a different colored highlighter. We sometimes discussed sentences down to the word. We imagined that our process was sort of like drafting a bill in the US Congress.

After the paper was written, we asked 40 of our scientific colleagues to read it and comment. From the responses, it was pretty obvious which scientists were eager to follow the data with us and which ones preferred to remain comfortably entrenched in their beliefs. Two and a half years later, after dissecting more than a thousand papers during almost a hundred lengthy videoconferences — and even more time reading, writing, and revising — we published our findings in *Psychological Science in the Public Interest*.

This collaborative project was one of the most rewarding experiences of my scientific career. Scientific practice is full of opportunities for people to tell you that you are wrong — journal reviews, grant application reviews, social media — but rarely do we create the conditions to actually *hear* the criticism and do something productive with it. In addition to *PSPI*, several other journals invite scientists to take an aisle seat. *Behavioral and Brain Sciences (BBS)* asks scholars to write commentaries on target articles (and the original authors get to respond), as do *Psychological Inquiry* and *Physics of Life Reviews*.

APS Past President Susan Fiske of Princeton University and her social psychology colleagues, APS Fellows Naomi Ellemers (Utrecht University, the Netherlands), Andrea Abele (University of Erlangen-Nuremberg in Germany), and Vincent Yzerbyt (Catholic University of Leuven, Belgium), and Alex Koch (University of Chicago) selected some aisle seats recently. They met in a hotel to confront their differences about the fundamental dimensions of social evaluation, using what they describe as a process of *adversarial alignment* (although to me it sounds more like constructive alignment). Where my colleagues and I began with the data and tried to figure out what they mean, Fiske and colleagues began with five conflicting, conceptual viewpoints and tried to reconcile them. Their aim was

to identify common theoretical ground, acknowledge disagreements, and compromise where possible, using strategies reminiscent of conflict negotiation. Like our *PSPI* working group, Fiske and her colleagues shared a commitment to curiosity, shared values, and trust. They actively read together, debated, and ultimately drafted two papers: one detailing their results, and a second that describes their constructive alignment process itself.

Most recently, my local coffee shop offered some aisle seating when I invited evolutionary psychologist Max Krasnow to discuss his views on my October 2019 presidential column about “zombie ideas” in science (long-disproven ideas that refuse to die). Max penned a vigorous online critique of several of my zombie nominations. Even though we had never met, we live just a few miles from one another, so I asked him to join me for coffee and pastries while we chatted about his concerns. After some lively discussion, we determined that our disagreements on most topics hinged on different vocabulary and semantics, except for one: waist-to-hip ratio in human females and its alleged relationship to reproductive success. In fact, when I wrote, “There should be a special place in hell, filled with mirrors, reserved for people who suggest that waist or hip size predicts anything important about a woman!” some young scientists who study evolutionary psychology experienced my words as mean-spirited. I had meant them as a joking commentary on being a woman in a culture that is preoccupied with looks and dress size. Taking an aisle seat sometimes means acknowledging that the message you intend is different from the one received. I offer a deeply felt apology to those who were offended by my ill-fated attempt at humor. Look for more about my discussion with Max in a future column, along with an *Observer* article highlighting the recent developments in research on waist-to-hip ratio.

One thing I’ve learned over the past 25 years of doing science is that lack of criticism means I’m playing it too safe. I don’t always have time to take an aisle seat the way that I would like, but when I do, I almost always learn something, even if it’s occasionally something I don’t particularly want to know.

So this year, let’s all make a resolution to cultivate new opportunities for discovery and progress in our scientific work. Reach out to someone whose research ideas are different from or even conflict with your own. Instead of bickering with them in your head as you have your morning shower, blasting them on Twitter, or eviscerating them as an anonymous reviewer of their manuscripts or grant applications — options that can prevent meaningful discussion and, correspondingly, scientific progress — why not invite them out for tea or have a video chat? Transform your adversaries into your greatest resource, scientifically speaking. You might think you don’t have the stomach for tackling conflict head on. But then again, you might surprise yourself. And if you want to debate, offer to switch sides so that you each argue the other person’s perspective. Cultivate more inquiry and less advocacy.

If your adversaries are reluctant to engage in discussion about scientific disagreements, you can always offer to change the topic to something less controversial, like the 2020 U.S. presidential election. ●

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Have you ever “taken an aisle seat” and learned something new?
Please share your story by commenting on this column on
psychologicalscience.org/observer-takeanaisleseat.

Sara Algoe, The University of North Carolina at Chapel Hill; David DeSteno, Northeastern University; **Thomas Gilovich**, Cornell University; **Francesca Gino**, Harvard Business School; and **Sonja Lyubomirsky**, University of California, Riverside, *The New York Times*, November 23, 2019: Why Gratitude Is Wasted on Thanksgiving.

Paulo Boggio, Mackenzie Presbyterian University, *Greater Good Magazine*, November 19, 2019: Four Ways Gratitude Helps You With Difficult Feelings.

Lawrence Calhoun, The University of North Carolina at Charlotte; and **Frank Infurna**, Arizona State University, *The Conversation*, November 15, 2019: Do We Actually Grow From Adversity?

Serena Chen, University of California, Berkeley, *The New York Times*, November 20, 2019: How to Have Closer Friendships (and Why You Need Them).

Molly Crockett, Yale University; and **Jonathan Haidt**, New York University Stern School of Business, *The Atlantic*, December 2019: The Dark Psychology of Social Networks.

W. Tecumseh Fitch, University of Vienna, Austria, *Science*, November 22, 2019: The World in a Song.

Robyn Fivush, Emory University, *The Wall Street Journal*, November 11, 2019: The Secret Benefits of Retelling Family Stories.

Alison Gopnik, University of California, Berkeley, *Quartz*, November 6, 2019: Charting how the time parents spend with kids changes as they grow up.

Samuel Gosling, University of Texas; **Shigehiro Oishi**, Columbia University; and **Jason Rentfrow**, University of Cambridge, UK, *The Atlantic*, November 18, 2019: The Three Personalities of America.

Adam Grant, The Wharton School of the University of Pennsylvania; and **Jamil Zaki**, Stanford University, *The Atlantic*, December 2019: Stop Trying to Raise Successful Kids.



THE THREE PERSONALITIES OF AMERICA

The friendly Midwesterner, chill Californian, and courageous Southerner may sound like clichés, but Jason Rentfrow's work on regional psychology suggests these archetypes may have some basis in reality. Surveys of millions of Americans suggests the interplay of genetics and environment may lead individuals on one coast or the other to behave a little differently, concur APS Fellows **Sam Gosling** and **Shigehiro Oishi**.

THE ATLANTIC | NOVEMBER 18, 2019

Ellen Langer, Harvard University; and **Michael Norton**, Harvard Business School, *The New York Times*, November 7, 2019: The Unexpected Joy of Repeat Experiences.

Neil A. Lewis, Jr., Cornell University, **Leah H. Somerville**, Harvard University; and **Jay Van Bavel**, New York University, *Science*, October 22, 2019: Tips for Easing the Service Burden on Scientists From Underrepresented Groups.

Julie Mennella, Monell Chemical Senses Center, *The New Yorker*, November 18, 2019: Can Babies Learn to Love Vegetables?

Carey Morewedge, Boston University Questrom School of Business, *Harvard Business Review*, October 30, 2019: AI Can Outperform Doctors. So Why Don't Patients Trust It?

Thomas Pettigrew, The University of California at Santa Cruz; **Susan Fiske**, Princeton University; and **David Myers**, Hope College, *The San Francisco Chronicle*, December 11, 2019: Psychology Explains Why Trump Supporters Shrug at Impeachment.

Paul Rozin, University of Pennsylvania, NPR, November 11, 2019: Hungry, Hungry Hippocampus: The Psychology of How We Eat.

Daniel Willingham, University of Virginia, *Los Angeles Times*, November 21, 2019: Math scares your child's elementary school teacher — and that should frighten you.

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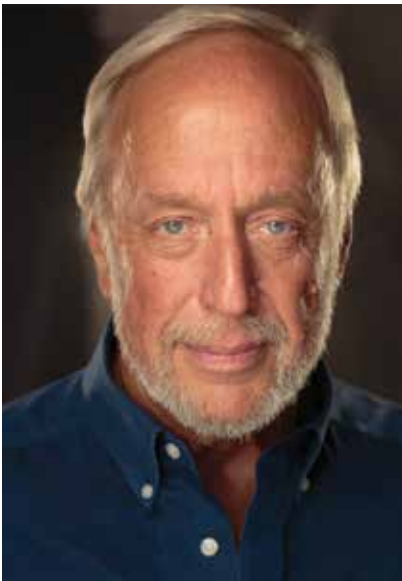
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ROBERT PLOMIN RECEIVES GRAWEMEYER AWARD FOR BEHAVIORAL GENETICS RESEARCH



Robert Plomin
King's College London

APS Past Board Member and William James Fellow **Robert Plomin** of King's College London has received the 2020 University of Louisville Grawemeyer Award for Psychology for his research on how DNA shapes personality.

Plomin's theory on the "nature of nurture" brings together genetic and environmental perspectives on the psychological science of individual behavioral differences, even between siblings raised in the same household.

"Genes make us who we are by influencing how we interact with the world around us, driving the

way we select, modify, and even create our environment," Plomin said in a statement for the award announcement. "DNA isn't all that matters, but it matters more than everything else put together."

His ongoing Twins Early Development Study (TEDS) has followed more than 10,000 pairs of twins born in the United Kingdom since 1994, tracing their development from infancy into early adulthood. Data from this study has shed light on the role of genetics in outcomes related to health, education, and psychological well-being, including the genetic basis of developmental disorders such as attention deficit/

hyperactivity disorder and autism.

"His work has revolutionized behavioral genetics and deepened our understanding of why we have the personalities we do," said award director Keith Lyle, an associate professor of psychological and brain sciences at the University of Louisville, Kentucky. "In particular, it has shown that genetic influences affect us in ways previously unknown."

In addition to serving as secretary of the APS Board from 1992 to 1994, Plomin was a member of *Psychological Science's* editorial board from 2012 to 2015. He is a fellow of the British Academy, the American Academy of Arts and Sciences, and the American Academy of Political and Social Sciences. He has published more than 800 papers and nine books, including "Blueprint: How DNA Makes Us Who We Are," published in 2018. He received the APS William James Fellow Award in 2005.

Grawemeyer Awards are presented each year to individuals in the fields of education, music composition, religion, and ideas for improving the world, in addition to psychology. The late H. Charles Grawemeyer, an industrialist, philanthropist, and University of Louisville alumnus, created the awards in 1984 with an initial endowment of \$9 million. Winners receive a \$100,000 prize.

As part of his award, Plomin will present a lecture on his work in April 2020 in Louisville. ◉

Genes make us who we are by influencing how we interact with the world around us, driving the way we select, modify, and even create our environment.

—Robert Plomin

OVER 50 APS LEADERS AND FELLOWS MAKE LIST OF TOP-CITED RESEARCHERS FOR 2019

More than 50 APS Fellows are among the most highly cited researchers of the last decade, according to a new report. Included in that list are APS President **Lisa Feldman Barrett**, Past President **John T. Cacioppo**, several recipients of APS lifetime achievement awards, and a Nobel laureate.

The psychological scientists are listed in the Web of Science Group's *Highly Cited Researchers 2019*, an annual list of influential researchers around the world. The list contains approximately 6,200 scientists whose work ranks in the top 1% of citations in their fields for papers published during the period of 2008–2018.

The list covers 21 fields ranging from materials science to neuroscience and behavior. Barrett and Cacioppo are among 14 APS Fellows listed in a new cross-field category that recognizes researchers with substantial influence across several disciplines. Barrett, who is also a recipient of the APS Mentor Award, is one of the world's foremost experts on the science of emotion and directs the Interdisciplinary Affective Science Laboratory at Northeastern University. Cacioppo, an APS William James Fellow who died in 2018, was a University of Chicago researcher and co-founded the field of social neuroscience with APS Fellow **Gary Berntson** of The Ohio State University.

Also included in the cross-field list are:

- APS Past Board Member **Deanna Barch**, Washington University in St. Louis, who researches behavioral and cognitive deficits in mental illnesses;

- APS William James Fellows **Joseph LeDoux**, New York University, who studies the brain circuitry's impact on fear and anxiety; and **Daniel L. Schacter**, a Harvard University scientist who explores the psychological and biological aspects of memory and amnesia; and
- James McKeen Cattell Fellow **Ian Deary**, whose work at the University of Edinburgh centers on intelligence, cognitive aging, and cognitive epidemiology.

Included in the neuroscience and behavior category are APS William James Fellow **Bruce McEwen**, Rockefeller University, and APS Fellow **Edvard Moser**, a neuroscientist at the Norwegian University of Science and Technology (NTNU). McEwen has spent nearly 50 years studying how hormones regulate the brain and nervous system. Moser shared the Nobel Prize in Physiology and Medicine in 2014 with APS Fellows **May Britt-Moser**, a psychological scientist at NTNU, and **John O'Keefe**, University College London, for their work identifying the place cells that constitute the brain's positioning system.

The categories also include psychiatry/psychology and social sciences. Among the psychological scientists included under psychiatry/psychology are APS William James Fellow **John Jonides**, a cognitive neuroscientist and psychological scientist at the University of Michigan, and APS James McKeen Cattell Fellows **Richard A. Bryant**, a PTSD researcher and director of the University of New

South Wales Traumatic Stress Clinic in Australia; **Geraldine Dawson**, whose work at Duke University Medical Center has focused on early detection, brain development, and treatment of autism spectrum disorder; **Tom Joiner**, director of the Laboratory for the Study and Prevention of Suicide-Related Conditions and Behaviors at Florida State University; **Elaine F. Walker**, whose research interests at Emory University include the precursors and neurodevelopment aspects of schizophrenia and other mental disorders; and **Susan Nolen-Hoeksema**, a Yale University professor who studied rumination in depression. Nolen-Hoeksema passed away in 2013.

James McKeen Cattell Fellow **Nancy Adler**, director of the Center for Health and Community at the University of California, San Francisco, School of Medicine, is listed under the social sciences category, as is APS Fellow **Mark Hatzenbuehler** (Columbia University), who studies the health consequences of stigma and is a 2016 recipient of the APS Janet Taylor Spence Award for Transformative Early Career Contributions.

The Web of Science Group is an information and technology provider for the global scientific community. It provides data, analytics, workflow tools, and other services to researchers, universities, governments, funding organizations, publishers, and corporations. ●

CARING FOR LOVED ONES THE TOP PRIORITY FOR PEOPLE WORLDWIDE

The human pursuit of romantic love and sex may be the mainstay of evolutionary psychology research, but according to the results of a global study published in *Perspectives in Psychological Science*, most people cite caring for family members as their top priority.

An international team of researchers led by evolutionary and social psychologists from Arizona State University (ASU) surveyed 7,000 people from 27 countries about what matters most to them. Respondents consistently rated family care and mate retention as the most important motivations in their lives, the researchers report. The findings were replicated in regions with collectivist cultures, such as South Korea and China, and in regions with individualistic cultures, such as Europe and the United States.

Forty-seven researchers from more than 30 institutions worldwide participated in the study, which was supported by the National Science Foundation.

The scientists noted that for the past 40 years, evolutionary psychological research has focused on people's pursuit of romantic and sexual partners and its effects on their behavior. But study participants consistently rated this motivation as the least important factor in their lives.

"Studying attraction is easy and sexy, but people's everyday interests are actually more focused on something more wholesome — family values," said APS Fellow **Douglas Kenrick**, an ASU psychological scientist and senior author on the study. "Everybody cares about their family and loved ones the most, which, surprisingly, hasn't been as carefully studied as a motivator of human behavior."



In the study, the research team used a set of survey questions about fundamental life goals, including caring for family, finding a mate, spending time with friends, avoiding disease, and staying safe.

The lead researchers sent the set of questions to scientists in each of the participating countries, who then translated the questions into the native language and made edits so that all the questions were culturally appropriate. The study included people from countries ranging from Australia and Bulgaria to Thailand and Uganda, and covered all continents except Antarctica.

Caring for and supporting family members ranked as the strongest motivations even among young adults and singles.

The research team is currently working on collecting information about the relationship between fundamental motivations and well-being

around the world. Kenrick noted in the journal article that his previous research with ASU colleague **Michael Varnum** demonstrated that people who rank mate-seeking as their most important objective were less satisfied with their lives and were more likely to be depressed or anxious. People who rated family care and long-term relationships as the most important features of their lives reported the highest sense of well-being.

"People might think they will be happy with numerous sexual partners," Kenrick said, "but really they are happiest taking care of the people they already have." ●

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THE SOCIAL DYNAMICS OF ENVIRONMENTALISM

How our relationships with nature and society influence proenvironmental behavior

In September 2019, millions of protesters across the globe walked out of their classrooms and workplaces and took to the streets to demand that governments take concrete action to avert catastrophic climate change. Participants in the global climate strike demanded that international leaders step up environmental regulations, end government subsidies for the fossil fuel industry, and invest in the infrastructure necessary to rapidly transition to 100% renewable energy. Months later, citizens continue to take to the streets in support of environmental sustainability worldwide.

Global warming and pollution are often portrayed as issues that fall squarely on the backs of individual consumers. But proenvironmental protesters argue that it's difficult, if not impossible, to go green when renewable energy options, reliable public transportation, and environmentally friendly product alternatives can be difficult to find — and often difficult to afford even when they are available.

On the surface, protesting in support of systemic change and altering one's personal consumption habits by choosing to take the bus or investing in a reusable shopping bag may all appear to fall under the umbrella of “environmentalism.” In the realm of psychological science, however, the factors that motivate people to engage in proenvironmental consumption in their personal lives and to take politi-



By **Kim Armstrong**
APS Staff Writer



cal action in society at large have been found to differ significantly.

Research suggests that our willingness to engage in these activities reflects not only how we identify as a part of our social and political ecosystems, but also how we envision our relationship with nature itself — and that the relative importance of each of these relationships can vary widely between cultures.

The Psychology of the Commons

Climate protesters' emphasis on government intervention, and regulation in particular, represents one solution to the oft-cited "Tragedy of the Commons." In a 1968 essay that remains one of the most cited works in the social sciences literature, evolutionary biologist Garrett Hardin framed this concept in terms of herdsmen managing a communal pasture, according to Mark Van Vugt, a professor of psychology at Vrije Universiteit Amsterdam, writing in *Current Directions in Psychological Science*.

In Hardin's model of the social dynamics surrounding common resources, individual herdsmen benefit economically by adding additional cattle to the shared field. This incentive to overgraze can lead to ecological disaster

for everyone, including those who choose to herd responsibly. Hardin's model suggests that mutually agreed upon coercion — that is, top-down regulation — is required to prevent opportunists from taking advantage of these kinds of common resources. This could take the form of enforcing a cattle limit, regulating pollution, or even legislating a nationwide transition to wind, solar, and other forms of renewable energy.

In certain contexts, individuals do seem to demonstrate the self-interest Hardin warned against. In a field study published in *Evolution and Human Behavior*, Jeffrey Winking and Nicholas Mizer, anthropologists at Texas A&M University, put individuals' prosociality to the test by having a confederate approach 60 unwitting participants at a casino bus stop in Las Vegas. In the first condition, the confederate, who claimed he was late for his ride to the airport and so had been unable to cash in his chips, gave each participant \$20 worth of casino chips; in the second condition, the confederate suggested that the participant could split the chips with another confederate, who was speaking on the phone nearby.

In a third condition, the researchers openly approached participants and asked them to divide the \$20 in casino chips between two envelopes: one that would go to the participant and another that would go to a randomly selected individual at some point in the future.

Participants in the third condition, who were aware of the experiment, gave an average of \$5.43, or 27% of their chips, to the unknown individual, but not one person in either of the first two conditions chose to share their chips. In fact, some participants couldn't even be debriefed on the experiment because they ran off as soon as they had the money in their grasp.

But it's rare for individuals to be so purely driven by the economics of a situation — a trope some psychological scientists refer to as the "myth of self-interest," noted APS Fellow Paul A. M. Van Lange (Vrije Universiteit Amsterdam) and colleagues in *Current Directions in Psychological Science*. There are numerous examples of communities successfully self-regulating the sustainable use of agricultural lands and fisheries, Van Vugt wrote, and some individuals are more likely to consider the future consequences of their actions on the environment than others. This is particularly true when individuals' social identities are closely tied to the community — whether that "community" be around the corner or on the other side of the world.

Consider this *Psychological Science* study involving 1,195 participants, ages 18 to 75, from urban and rural areas in the United States, Italy, Russia, Argentina, South Africa, and Iran. Researchers Nancy R. Buchan (University of South Carolina), APS Past President Marilyn B. Brewer (University of New South Wales), and colleagues gave each individual 10 tokens. They could either keep all of the tokens, guaranteeing a modest payout, or distribute some of them to a local or world account. There, the tokens would increase in value and be split with either three players from the individual's local community or 11 players from around the globe. If the other players in the group gave at similar or higher rates, the participant would benefit from contributing to these accounts; but if the other players didn't behave as generously, they would end up with even less than they started with.

After making their contributions, participants estimated how many tokens they expected each individual in their local and global groups would contribute to each account. They also reported how concerned they were with global issues such as climate change and income inequality and completed measures of social identity designed to determine how strongly they defined themselves as members of their local communities and the world as a whole.

In line with previous findings on the reciprocal nature of cooperation, participants' expectations about group members' contributions significantly influenced

It's rare for individuals to be so purely driven by the economics of a situation — a trope some psychological scientists refer to as the "myth of self-interest."

how much they gave. The contributions of individuals with more global social identities, however, were systematically higher than what would be predicted from expectations alone.

“Participants who described themselves as identified with the world community literally ‘put their money where their mouth was’ in making decisions to contribute significant resources despite the potential cost to personal wealth,” Buchan and colleagues reported.

Global social identity may help individuals generalize in-group behavior across national boundaries, the researchers continued. This could serve as a powerful tool for combating international social dilemmas such as climate change that require individuals and nations alike to commit to change without any guarantee of cooperation, the authors continued.

One With Nature, One Within Society

In contrast to these social dilemmas, research suggests that the factors that spur environmentally friendly living may be influenced not only by our relationship with others, but also by how we identify with the natural world itself.

In a survey of 351 online participants, Michael T. Schmitt, Caroline M. L. Mackay, and Daphne Payne, of Simon Fraser University, Canada, and Lisa M. Droogendyk of Sheridan College, Canada, found that participants who reported identifying more strongly as a part of nature were also more likely to self-report proenvironmental behaviors such as driving less and eating a vegetarian diet.

This “sense of oneness” with the natural world was found to have a weaker relationship with participants’ reported likelihood of engaging in proenvironmental activism, however, Schmitt and colleagues noted in the *Journal of Environmental Psychology*.

Instead, individuals’ likelihood of engaging in activism was predicted by the strength of their politicized environmental identity — that is, how

Identification with nature is less likely to lead to politicized environmental identification if it is not also accompanied by the perception of conflict between groups with competing interests (e.g., environmentalists vs. fossil fuel companies) within the context of a larger social system, Michael T. Schmitt and colleagues found.

strongly they socially identified with the collective of environmental activists, organizations, and other groups advocating for systemic change in the way societies regulate industry, resources, and energy use. In a longitudinal study of 62 students in Schmitt’s Psychology and Environmental Sustainability class, the researchers similarly found that politicized identification, rather than personal identification with nature, predicted participants’ self-reported activist work over the course of a 3-month semester.

“Social change behaviour is much more strongly predicted by identification with a politicized group — one that defines itself in terms of a collective resistance or social movement within a wider context of social conflict and competing interests,” Schmitt and colleagues wrote.

Environmental campaigns often emphasize humanity’s place in the natural world, attempting to leverage our relationship with the plants, animals, and ecosystems that support life on Earth into a call for proenvironmental action. But emphasizing individuals’ connections with the activists and organizations fighting for institutional change to mitigate climate change may more effectively move people to take political action, the researchers wrote.

“Identification with nature is less likely to lead to politicized environmental identification if it is not also accompanied by the perception of conflict between groups with competing interests (e.g., environmentalists vs. fossil fuel companies) within the context of a larger social system,” the researchers concluded.

Promoting awareness of environmental threats and a sense of moral obligation toward nature can also encourage activism — but not everyone responds to the same set of moral values, found Matthew Feinberg (Stanford University) and Robb Willer (University of California, Berkeley) in an article published in *Psychological Science*.

Environmental issues tend to be framed in terms of harm, care, and fairness, and proenvironmental campaigns commonly emphasize humanity’s obligation to protect nature, Feinberg and Willer explained.

On the surface, liberal-leaning individuals may seem to respond more strongly to this argument because they are more likely to view environmentalism as a moral issue, the researchers continued. In a survey of 187 participants, for example, Feinberg and Willer found that self-identified liberals were more likely than self-described conservatives to describe as immoral a hypothetical



Believers and deniers of climate change often frame the issue so that the two sides talk past each other. Discussing environmental issues in the moral terms suited to different political audiences can help improve communications.

man who chose not to recycle his plastic water bottle.

This may not result from an inherent conflict between conservatism and environmentalism, however. Part of the problem, Feinberg and Willer wrote, is that proenvironmental messages often neglect the moral domains such as loyalty, authority, and purity that tend to appeal to conservatives.

Feinberg and Willer investigated this relationship through a survey of 388 participants from 15 US cities. Participants were split into three conditions: a neutral condition, in which they read about neckties; a harm/care condition, in which they read a message about the importance of protecting the environment from destruction caused by humanity; and a purity/sanctity condition, in which they read about the importance of eliminating pollution and contamination. Participants in the harm/care condition then viewed images of environmental degradation, including a barren coral reef, while those in the purity/sanctity condition were shown images of pollution clouds, a person drinking dirty water, and a garbage-strewn forest.

Finally, participants completed measures of attitudes about the environment and legislation designed to protect it. They also reported their feelings of disgust, an emotion that has been found to play an important role in conservative moral judgments.

Overall, Feinberg and Willer found that appeals to ecological purity, but not care, triggered conservative participants' self-reported disgust, causing them to be just as supportive of proenvironmental attitudes and policy as more liberal participants in any of the three conditions.

Believers and deniers of climate change often frame the issue so differently that the two sides talk past each other, the researchers wrote. Discussing environmental issues in the moral terms suited to different political audiences can help improve communication.

"Political polarization around environmental issues is not inevitable but can be reduced by crafting proenvironmental arguments that resonate with the values of American conservatives," Feinberg and Willer wrote.

Global Solutions

Informational strategies such as those outlined above can powerfully motivate proenvironmental actions, wrote Kimin Eom (Singapore Management University), Heejung S. Kim and David K. Sherman (University of California, Santa Barbara), and Keiko Ishii (Nagoya University, Japan) in *Psychological Science*. Cultivating sustainable societies globally, however, requires an understanding of the significant cultural variability in what drives support for policy and behaviors worldwide.

Through a study of 57,268 participants from 47 countries, Eom and colleagues found that individuals' personal beliefs about environmental issues predicted proenvironmental support significantly more strongly in individualistic cultural contexts such as those in the United States, Australia, and Canada. Participants from these idiocentric societies who rated environmental issues such as global warming, loss of biodiversity, and pollution as high in seriousness were more likely to report a willingness to give up part of their income through a donation or tax if it was used to prevent pollution.

This link between environmental concern and action was much weaker for individuals in more collectivist societies such as Indonesia, Ghana, and Chile. Given that social conformity is highly valued in collectivistic societies, Eom and colleagues focused on another factor at play: social norms.

The researchers presented 149 European American and 102 Japanese undergraduate students with a series of 10 purchasing decisions. In each case, they could choose either a cheaper option or a slightly more expensive one with environmental benefits, such as a shampoo with biodegradable ingredients. Participants also completed a measure of environmental concern and reported what percentage of people they believed engaged in environmentally friendly behaviors such as recycling, carpooling, and energy saving in their own society.

As expected, the researchers found no relationship between Japanese students' self-reported levels of environmental concern and their willingness to pay more for a green product. Instead, this choice was reflective of how common they perceived proenvironmental behavior to be in their society.

Being a good group member is often prioritized over pursuing personal goals in collectivist societies, wrote Eom and colleagues. In these contexts, highlighting the social desirability and frequency of existing proenvironmental behavior may be more effective than focusing on informing the public about the urgency of environmental problems.

"Solving environmental challenges requires leveraging psychological diversity to motivate people across the globe," they added. "To design effective sustainability strategies and proenvironmental campaigns, it is important to identify and

Proenvironmental Personalities

An article in a forthcoming edition of *Perspectives on Psychological Science* further explores why individuals do (and do not) adopt proenvironmental attitudes and behaviors. Mounting evidence suggests that individuals who are open, honest, and conscientious — among other personality traits — are more likely to view issues such as climate change as important, and to take actions to improve the environment themselves. Accounting for individual differences in how we approach environmentalism can help advocates build more effective policies and outreach efforts, according to Alistair Soutter, Timothy Bates, and René Mörtuss of the University of Edinburgh.

Access *Perspectives on Psychological Science* at psychologicalscience.org/publications/perspectives.

understand cultural variation in the factors driving proenvironmental action.”

That’s not to say that campaigns should go all in on one strategy or the other, noted Eom, Sherman, Kim, and Viki Papadakis (University of California, Santa Barbara) in another article in *Current Directions in Psychological Science*. Informational and social factors dynamically influence behavior across a range of sociocultural contexts, and socioeconomic status (SES) and religiosity play a role as well. Social norms may play a greater role in the behavior of individuals in low-SES contexts, in which economic limits on individual autonomy can foster a heightened sense of interdependence, the researchers explained. Many religions, meanwhile, emphasize some version of environmental stewardship, often because of a sense of social responsibility to a higher power.

“Policymakers and activists are advised to use both informational and social-norm approaches in conjunction, perhaps with differential balances depending on the characteristics of communities,” Eom and colleagues concluded.

In the United States, for example, awareness of the shifting social norms around behaviors such as water conservation and meat consumption can encourage individuals to embrace green living, too.

Gregg Sparkman and Gregory M. Walton (Stanford University) investigated the role of dynamic social norms in environmentally friendly behavior through a study of approximately 1,200 residents living in graduate-student couples housing in three nearly identical on-campus high-rises during a summer drought. In the static norm facility, the researchers placed signs that read “Most Stanford Residents Use Full Loads!” on the dorms’ washing machines, while students in the dynamic norm condition operated washing machines labeled “Stanford Residents Are Changing: Now Most Use Full Loads!” Washing machines in the control facility remained unlabeled.

Over a period of 3 weeks, students who saw the static norms messaged reduced their water use by 9%, while those in dynamic norms message used 28% less water, conserving significantly more than those in the control and static norm conditions, Sparkman and Walton reported in *Psychological Science*.

“We often see norms as something that stands in the way of change, but it’s possible that they can also be leveraged to facilitate change in the world, too” Sparkman said. “People probably have lay intuition that change isn’t easy. If you start seeing other people change, it can give you a reason to question psychological barriers to change.” ●

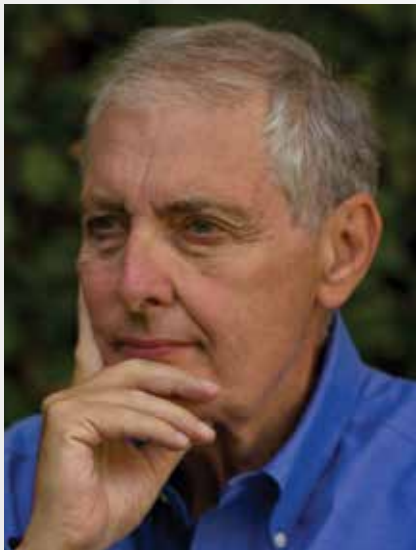
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Interviewed By
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FRONTIERS OF PSYCHOLOGICAL SCIENCE: AN INTERVIEW WITH EVELINE CRONE

The eminent psychological scientist and APS Fellow is now heading up behavioral science at one of the European Union's largest science funders.

Eveline Crone, Professor of Neuro-cognitive Developmental Psychology at Leiden University, has been elected as vice president of the European Research Council (ERC), an EU-focused scientific funding body with an annual budget of over €2 billion. In her new role, Crone oversees the funding of the social sciences and humanities, a portfolio that includes psychological science.

Crone, a member of the ERC scientific council, studies brain development in children and adolescents, focusing on how the brain permits complex decision-making in daily life. In 2017, she was awarded the Spinoza Prize, which is the highest scientific award in the Netherlands. In April, she will begin a new position as professor of developmental neuroscience in society at the Erasmus School of Social and Behavioural Sciences, at Erasmus University Rotterdam.

In a Q&A with the *Observer*, Crone discusses the role of psychological science at the ERC and the exciting opportunities afforded by her new role.

What does it mean to you to be overseeing the social sciences and humanities disciplines at the European Research Council?

Eveline Crone: I am very honored to have been elected as ERC vice-president. The ERC covers all fields of science, engineering, and scholarship, divided into three research domains



Eveline Crone, a Leiden University psychological scientist who studies brain development in children and adolescents, is vice president of the European Research Council.

— Social Sciences and Humanities, Life Sciences, and Physical Sciences and Engineering — each represented by one of the three ERC vice presidents who oversee the activities in their respective domains. Since 2017, I have already been one of the 22 members of the ERC Scientific Council — the governing body of the ERC — who represent the European scientific community at large. The core business of members, who are all active researchers in their respective fields, is to set the ERC strategy and select the peer review evaluators. The different domains work very closely together.

I am of course particularly thrilled that I will be in charge of Social Sciences and Humanities when I take up duties in January. It is a domain that uses multiple perspectives to embrace scientific complexity and contributes to societal and individual issues that occupy the world today. This domain

encompasses seven peer review panels at the ERC that I will be overseeing.

I am incredibly motivated to work with the ERC; it is an organization that truly makes a difference. I strongly believe in the ERC's investigator-driven nature, in which researchers approach problems not only from the perspective of tomorrow, but also from the vantage point of the generations of the future. It has already proven itself as a European success story and has shown that the formula it runs on works — giving top researchers the opportunity to carry out their dream project, selected on the single dimension of excellence.

What role do psychological science and basic behavioral research have at the ERC?

Crone: The ERC's grants operate on a bottom-up basis without predetermined priorities — that's our trademark. We treat all fields of research equally, and the budgets for the various fields are driven by demand. The peer review is in the hands of 25 evaluation panels covering all fields of research. Psychological science and behavioral research are evaluated by the panel "The Human Mind and Its Complexity," which covers cognitive science, psychology, linguistics, philosophy of mind; and by the panel "The Social World, Diversity, Population," which covers sociology, social psychology, social anthropology, demography,

The ERC "has shown that the formula it runs on works — giving top researchers the opportunity to carry out their dream projects, selected on the single dimension of excellence."

—Eveline Crone

education, and communication. The panel "Neuroscience and Neural Disorders" covers neural cell function and signalling, systems neuroscience, neural bases of cognitive and behavioral processes, and neurological and psychiatric disorders. This could therefore also be the panel suitable for applicants proposing research on psychological and behavioral sciences from the life-sciences perspective. Interdisciplinary proposals are evaluated within the primary panel with input from panel members from one or more other panels and remote referees.

As someone who has been a speaker at the International Convention of Psychological Science (ICPS), what can APS and ICPS do to promote and encourage the bottom-up, frontier research that the ERC strives to support?

Crone: We are grateful that APS and ICPS continue to encourage researchers, especially young ones, to follow their scientific curiosity and push the frontiers of knowledge. Be daring in your research and do not fear failure! In this day and age, this message and scientific freedom are more crucial than ever. It cannot be emphasized enough.

What kind of attention is the ERC devoting to integrative research initiatives like those that are the cornerstone of ICPS?

Crone: APS is dedicated to advancing scientific psychology across disciplines and geographic borders. One of its main goals is to foster the integration of scientific perspectives within psychological science and with related disciplines. This is actually in tune with the ERC's goal of supporting excellent investigators and their teams to pursue ground-breaking, high-risk/high-gain research. In particular, the ERC encourages proposals of a multi- or interdisciplinary nature that cross the boundaries between different fields of research; pioneering proposals addressing new and emerging fields of research; and proposals introducing unconventional, innovative approaches and scientific inventions. Having said that, it should be noted that the sole selection criterion is excellence; integrative or interdisciplinary research is not rated higher than monodisciplinary proposals.

Is there any current research or other work you are conducting currently that you would like to highlight to APS members?

Crone: My own research is driven by the question of how dynamic changes in brain development are related to cognition and behavior during childhood and adolescence. We study changes in brain structure and function that underlie our ability to anticipate, produce, and evaluate complex decisions in daily life, mostly using longitudinal behavioral and brain-imaging designs.

In recent years, we have come to understand how the many changes that occur in this important period in life open up opportunities for young people to explore, take risks, discover their identities, have purpose and meaning, and contribute to the challenges that the world faces today. This change — from a problem-focused definition of adolescence to valuing the opportunities — has been, and still is, a strong motivator for me. New directions that I am currently exploring include how we can employ citizen science in our designs, a novel direction of youth engagement that I am very excited about. We need many different perspectives to understand the complexity of human behavior, from interdisciplinary scientific approaches to understanding how our work finds its way in society, especially when it concerns young people.

So again, [my work has] many alignments with the goals and ambitions of APS. The new generation grows up in a world that is more globally oriented than we could even imagine, so understanding how we can create opportunities for youth all over the world is more important than ever. ●

Congratulations, New APS Fellows

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Noel Brewer

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Emily Butler

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Charissa Cheah

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Sun-Joo Cho

Vanderbilt University

Meredith Coles

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Northeastern University

Sara Cordes

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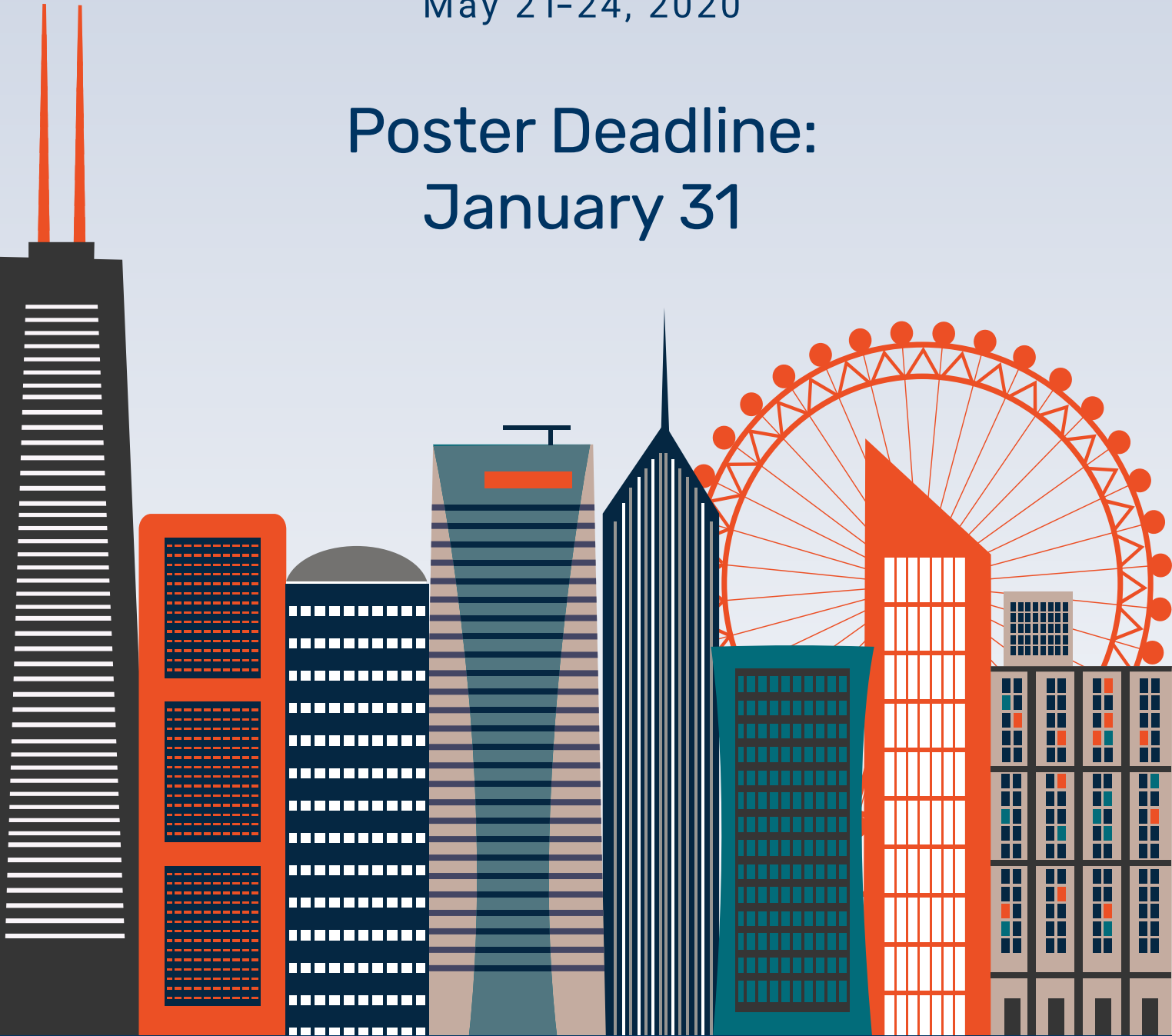
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FEATURED SPEAKERS



Fred Kavli Keynote Address
Ways to Think About the Brain and Cognition

György Buzsáki

New York University, School of Medicine

Buzsáki is known for many breakthrough “firsts.” His most influential work, the two-stage model of memory trace consolidation, revealed precisely how new information is reinforced while we sleep. His groundbreaking findings and advances in methodologies have earned him a host of honors, including the prestigious Brain Prize in 2011.



Saturday Keynote Address

Jennifer L. Eberhardt

Stanford University

Eberhardt, author of *Biased: Uncovering the Hidden Prejudice That Shapes What We See, Think, and Do*, examines racial bias and its consequences, particularly the ways in which bias expresses itself outside of our conscious awareness. In 2014 she received the illustrious MacArthur Fellowship – often referred to as the “Genius Grant”.

Eberhardt will sign copies of her book at the APS Booth in the Exhibit Hall.



Bring the Family Address
Becoming Human: How (and How Early) Do Infants Link Language and Cognition?

Sandra R. Waxman

Northwestern University

Waxman explores how we form some of our most profoundly fundamental concepts, such as what it means to be alive. She received the renowned Guggenheim Fellowship in 2007.



Presidential Symposium
Visceral Politics

Lisa Feldman Barrett
(Chair)

Northeastern University

APS President Lisa Feldman Barrett shifted the paradigm when she found evidence that emotions are constructed, in the moment, from a combination of environmental context, bodily sensory information, and our past experiences. She was honored with the prestigious Guggenheim Fellowship in 2019.

Sinan K. Aral

Massachusetts Institute of Technology

Eran Halperin

The Hebrew University of Jerusalem, Israel

Manos Tsakiris

Royal Holloway, University of London, United Kingdom

Jeanne L. Tsai

Stanford University

Hanna Rosin (Discussant)

NPR

Alix Spiegel (Discussant)

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32nd APS Annual Convention

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These programs cut across psychological science's sub - discipline, feature high profile speakers, and create networking opportunities for a broad audience. This year's topics include breaking boundaries, biological embedding, and resilience.

For more information and to submit a poster related to one of these themes visit:
www.psychologicalscience.org/conventions/annual

SPECIAL EVENTS



Featuring

George A. Bonanno

Columbia University

Interviewed by APS President Lisa Feldman Barrett



APS-David Myers
Distinguished Lecture
on the Science and
Craft of Teaching
Psychological Science
**Don't SoTL for Less: Challenges
and Issues in Researching
Teaching and Learning**
Regan A.R. Gurung

Oregon State University



Special Invited Address
**Lifecourse Mechanisms of
Disparities in Cognitive Aging
and Alzheimer's Disease**
Jennifer J. Manly

Columbia University

CLINICAL SCIENCE FORUM

Celebrating 25 years of the Academy of Psychological Clinical Science (APCS): Our Past, Present, and Future

Don't miss this special event organized by The Psychological Clinical Science Accreditation System (PCSAS) and The Academy of Psychological Clinical Science (APCS) featuring:

Dolores Albarracín, *University of Illinois at Urbana-Champaign*; **Ryan Bogdan**, *Washington University in St. Louis*; **BJ Casey**, *Yale University*; **Joanne Davila**, *Stony Brook University*; **Nicholas R. Eaton**, *Stony Brook University*; **Kathryn Paige Harden**, *University of Texas at Austin*; **Robert W. Levenson**, *University of California, Berkeley*; **Tené T. Lewis**, *Emory University*; **Richard M. McFall**, *Indiana University*; **Virginia Sturm**, *University of California, San Francisco*

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AWARD PROGRAMS

James McKeen Cattell Fellow Award Addresses



The Interpersonal Theory of Suicidal Behavior

Thomas E. Joiner

Florida State University



Promoting Positive Youth Development: Plasticity, Specificity, Non-Ergodicity, and Contributing to Social Justice Among Global Youth

Richard M. Lerner

Tufts University

William James Fellow Award Addresses



Neural Mechanisms of Memory and Imagery

Neil Burgess

University College London, United Kingdom



Mindsets: Adventures, Obstacles, Surprises, and Lessons

Carol S. Dweck

Stanford University



The Essential Child: What Children Can Teach Us About the Human Mind

Susan A. Gelman

University of Michigan



Foundations of Social Cognition: Self-Other Mapping and the 'Like-Me' Hypothesis

Andrew N. Meltzoff

University of Washington

APS Mentor Awards and Panel Discussion on Mentoring



Toni C. Antonucci

University of Michigan



Elizabeth Ligon Bjork

Robert A. Bjork

University of California, Los Angeles



Photo by Bruce Gilbert

E. Tory Higgins

Columbia University

Year in Review 2019

7.5
million

Page Views

Traffic to the APS website, psychologicalscience.org, reached an all-time high, with visitors seeking information about the latest research funding in our field, and members connecting with journals, employment and career resources, and more.

271,500

Social Followers

A widening world of psychological scientists and the public connected on APS's social media channels, including Twitter, Facebook, Instagram, and LinkedIn.

3100+

Media Pickups

Coverage of APS research appeared in hundreds of major media outlets all over the world in 2019, including stories throughout the year in *The New York Times*, *BBC News*, *Forbes*, *The Atlantic*, and *Scientific American*. Keep up with APS news at psychologicalscience.org/news.

2701

ICPS Attendees

Paris was an ideal locale for the 3rd biennial International Convention of Psychological Science, where 2,701 scientists and students representing 70 countries gathered in March to network and hear presentations from the world's leading integrative psychological scientists. Learn about the 2021 ICPS in Brussels at psychologicalscience.org/conventions/icps.

96

Countries

A ... Z, Albania to Zimbabwe, that is: In 2019, APS members hailed from 96 countries spanning six continents. 2020 membership goal: Antarctica! APS is covering the Earth.

Keep up with APS in 2020 at psychologicalscience.org.

From hosting a panoply of integrative science in Paris to helping policymakers understand the role of psychological science in critical social issues, APS had a momentous year. Here are some highlights.



42

PCSAS Accredited Programs

APS promotes psychological science to benefit society in health, the workplace, the environment, education, policy, and other areas, and strongly supports the Psychological Clinical Science Accreditation System (PCSAS), which now has 42 accredited programs and counting. Visit pcsas.org.

31st

Annual Convention

Descending on DC: The US Capitol set the backdrop for the 31st APS Annual Convention, which included presentations on applying behavioral science in government policymaking. APS Fellow **Carsten de Dreu**, Leiden University, served as the first non-US chair of the APS Convention Program Committee. Register for APS 2020 at psychologicalscience.org/conventions/annual.

19

APS Awards Recipients

APS presented its prestigious awards to 19 members whose groundbreaking work has shaped psychological science — and the careers of their students and colleagues — and to eight early-career researchers who are transforming the field. See the full list at psychologicalscience.org/observer/awards.

2

New Journal Editors

New editors took the helm at two APS journals. APS William James Fellow **Nora Newcombe** of Temple University is now Editor of *Psychological Science in the Public Interest*, while APS Fellow **Laura King** of University of Missouri-Columbia became Editor of *Perspectives on Psychological Science*. See all six field-leading APS journals at psychologicalscience.org/publications.

ONE

Great Year!

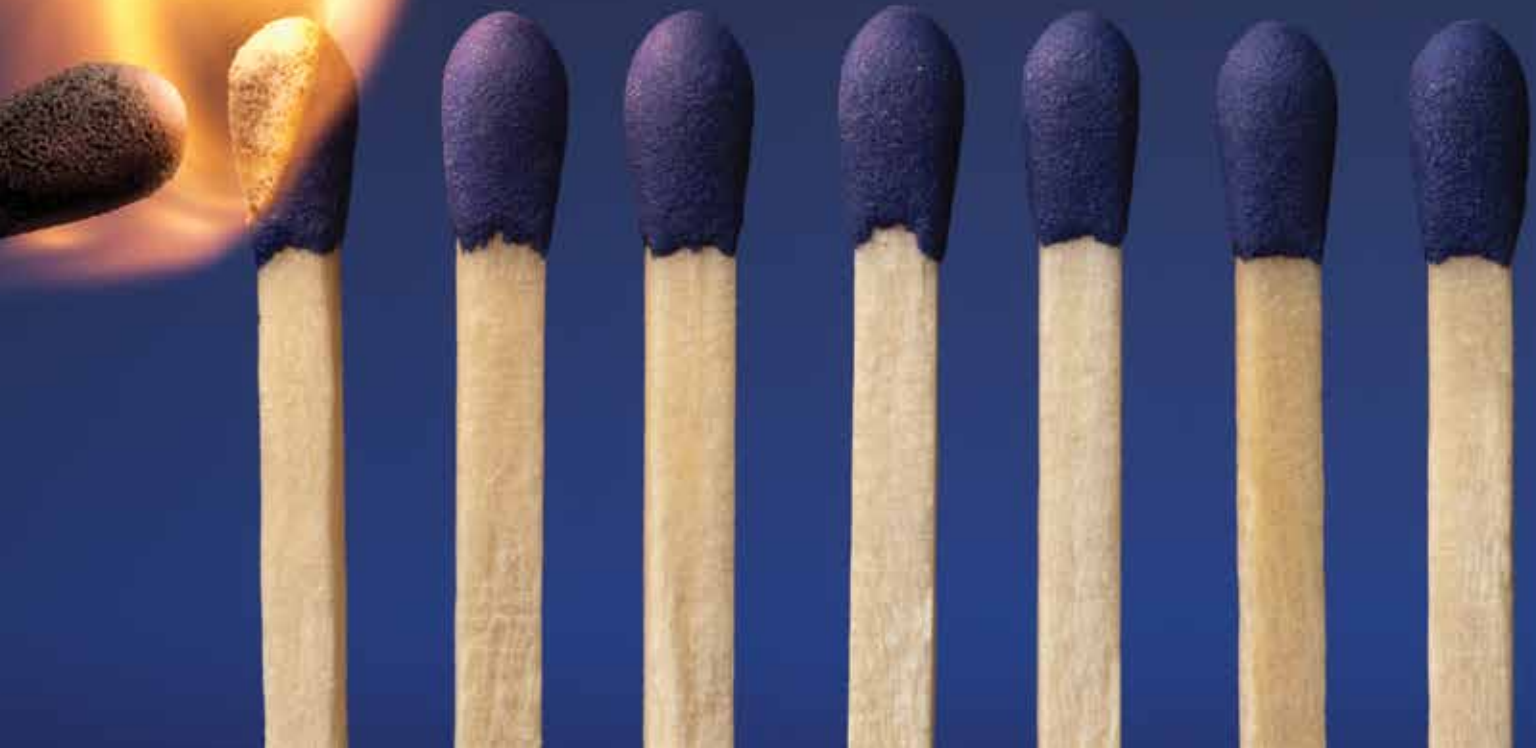
Keep up with APS throughout 2020! You'll find the latest in research news, convention coverage, awards recipients, and much more at psychologicalscience.org.



Sparking Change

Integrative research explores storytelling, metacognitive training, and embracing the “vujà dé” as strategies for understanding and changing patterns of behavior.

By Alexandra Michel



All around the globe, governments struggle with how to convince their citizens to engage in behaviors that will benefit their health and the environment. But whether it's joining a gym or addressing climate change, convincing people to change their minds and behaviors is one of the great challenges of psychological science.

Yet many of the world's most adept behavior change practitioners work far afield from a lab: Advertisers and marketers have achieved enormous success harnessing behavioral science findings to change minds en masse.

"Marketing has always stolen so many things from psychology," said Tom Beckman, the global head of creative at Prime Public Relations based in Sweden. Beckman believes that researchers need to embrace the experience of a *vujà dé* — the opposite of a *déjà vu*.

"A *vujà dé* moment is when you walk into a situation you've been in a thousand times and suddenly you see something new," he said.

Beckman counsels researchers and scientists to think beyond the simplest, most obvious solutions for changing minds. Instead, marketers try to understand what people will actually notice — what will stick with them — and this means paying attention to the cultural context, the zeitgeist of the moment. For example, Beckman explains how James Bond films must appeal to audiences all over the world; hundreds of millions of people have to buy movie tickets for the studio to make a healthy profit. Notice how the threats that Bond film villains have presented shifted over the decades to match the global anxieties of the time, from 1960s-era fears about nuclear bombs to the threat of climate change addressed in *Quantum of Solace* (2008).

The most important lesson marketing can offer behavior-change researchers, according to Beckman, is the concept of mutual value. Just as an apple has to be tasty to encourage animals and people to eat the fruit and

We don't like it when other people tell us how we should behave, even if we give them good advice.... However, we find it very, very difficult to resist a story.

—Enny Das, Radboud University Nijmegen

spread the seeds, successful behavior-change projects have to offer something of value to the target population.

"It has to be attractive," he said. "It has to be just like the apple; it has to be shiny, juicy, nutritious, in order for it to work. And that goes for you, too."

Strategic Stories

Stories can be used as a highly effective strategy for increasing people's interest and attention in a message, while decreasing their resistance to behavior change. Providing people with a good story also provides them with a meaning system and model for the right behaviors, according to Enny Das of Radboud University Nijmegen in the Netherlands. And stories are just fun, which can increase our attention and sidestep our resistance.

"We don't like it when other people tell us how we should behave, even if we give them good advice, like you should stop smoking or exercise more," Das said. "There are so many different creative strategies to say no to things that are good for you. However, we find it very, very difficult to resist a story."

For example, Das just completed a longitudinal study in which stories were used to persuade children into long-term improvements in brushing their teeth. However, stories don't always have to be happy and fun to convince us to change our minds. There has been a recent surge in interest on eudaimonic narratives — stories that evoke mixed emotions and deeper, more reflective feelings. Conflict and pain are essential components to any good story, and even tragic stories that focus on death or fear show promise as tools for shifting people's mindsets. Recently, Das has been integrating *terror management theory* — a model of the psychological defenses humans have developed in response to our awareness of death — into her research on how eudaimonic narratives from dramatic films influence our mindsets around death.

"Different stories can achieve different things," Das said. "We have fun stories that can increase attention for unwanted but important messages, we have eudaimonic entertainment that can increase reflection, and we have tragic entertainment that may break through different existing world views and open the mind up."

Signals of Change

Using a series of perceptual psychophysics tasks, Stephen Fleming's lab has been investigating the specific mechanisms that underpin how we change our minds at the cognitive and neural levels.

"You might vote in an election and then, later on, you might realize that wasn't such a good idea," explained Fleming, cognitive neuroscientist at the Wellcome Centre for Human Neuroimaging, University College



This article features findings presented last spring at an Integrative Science Symposium addressing the science of behavior change at the International Convention of Psychological Science in Paris. Practitioners from various professional backgrounds addressed the challenges of behavior change, from the underlying neural mechanisms involved in changes of mind to the design of national scale interventions.

The next International Convention of Psychological Science will be held in Brussels, Belgium, March 25–27, 2021. Learn more at psychologicalscience.org/conventions/icps.

London. “You might get new evidence about those political parties and decide eventually to change your mind.”

In a series of experiments, Fleming’s lab had participants make decisions about the movement of groups of dots, providing a minimal model for thinking about changes of mind. Participants rated their confidence in their choices and were incentivized to do so accurately. Whether participants changed their minds — and improved their accuracy according to the available evidence — largely depended on their initial confidence in their choices. Greater initial confidence led to fewer changes of mind, suggesting that confidence modulates the integration of the new postdecision evidence that people are receiving.

A series of neuroimaging studies pinpointed specific brain areas, the posterior medial frontal cortex and the anterior prefrontal cortex, that seem to be involved in simple changes of mind.

Additional evidence suggests that these low-level perceptual decisions

can also be useful for predicting real-world behaviors. In a large online study, participants responded to both perceptual-decision tasks and a series of questions about political beliefs. The results showed that people with a weaker ability to recognize their own incorrect decisions on the cognitive tasks were also more likely to hold radical beliefs about political issues. Fleming says that future research may examine whether metacognitive training, even with very simple tasks, may induce mindsets that promote changes of mind.

Scaling Up

Understanding and changing patterns of behavior at the societal scale is key to nearly every part of policy. Designing behaviorally sensitive policies requires a model for understanding behavior in its specific context, and models of behavior must be linked to applicable frameworks. One needs to think of an intervention or policy as if it’s a game of chess, advises Susan Michie, a professor of health psychology at University College London: You need to think through several steps ahead of where you are.

“If we’re to develop effective interventions to change behavior, we need to identify the key players in the system and understand the specific behaviors in their specific contexts,” Michie explained. “To effectively target behaviors, one needs to both start large in terms of the big picture but also drill down to the detailed granularity of the situation.”

The capability, opportunity, motivation, behavior model (COM-B) is a simple, yet comprehensive system for planning behavior change interventions. In this system, behavior occurs as an interaction among three necessary conditions: capability, opportunity, and motivation. For any behavior to occur, the intended agent needs to have the capability — without the capability to enact it, the behavior won’t occur. One also needs to have the opportunity to enact the behavior. For example, simply knowing how to ride a bicycle is insufficient — you also need safe, convenient spaces to ride. Finally, you must be motivated to complete the behavior.

Through the Human Behavior-Change Project, Michie is working with an interdisciplinary team using machine learning and artificial intelligence to synthesize the vast body of behavior change evidence to create a new, more functional ontology of behavior change.

“The scale of evidence that can be analyzed by these computational methods will allow the system to generate new hypotheses and advance our understanding of human behavior and answer questions with up-to-date evidence tailored to user need and context,” she said. ●

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— Alexandra Michel is a freelance writer based in Baltimore.

HERE, THERE, BUT NOT EVERYWHERE

Lynn Nadel on how the hippocampus gives memories context

Back in the late 1800s, when psychological science was, in William James' words, "only the hope of a science," he understood that there were different kinds of memory and that habits and memory operated separately.

James introduced the field "to the idea that there were different kinds of memory, although there were inklings of it prior to him," said Lynn Nadel, a professor of psychology at the University of Arizona, during his APS William James Fellow Award Address at the 2019 APS Annual Convention in Washington, DC.

Beginning decades later in the 1940s, the work of Donald Olding Hebb, a mentor of Nadel's at McGill University in Montreal, would help establish the existence of short- and long-term memory and of brain plasticity as the basis of learning and development. During this time, Hebb's student Brenda Milner (who would go on to become an APS William James Fellow) had the opportunity to investigate the unique case of one Henry Molaison, a man known at the time only as H.M.

The predominant understanding of memory in the 1950s and '60s was that immediate, short-term, and long-term memory all existed as a part of the same system. Molaison, after having a large chunk of his hippocampus removed in a surgery intended to limit his epileptic seizures, retained memories of his life before the surgery, and could maintain information in short-term memory for up to 20 seconds at a time. But he could no longer move material from short-term to long-term memory.

This seemed to suggest that the hippocampus serves as a catalyst of memory consolidation, supporting



2019 William James Fellow **Lynn Nadel** has helped to set the international research agenda in studies of the hippocampus, spatial cognition, and episodic memory.

this transfer of information. Researchers could not, however, recreate Molaison's amnesia by lesioning the same brain area in animal models, and the field was thrown into "complete chaos," Nadel said.

Questions about the hippocampus' purpose would remain at the forefront of memory science for over a decade until 1971, when psychological scientist and APS Fellow John O'Keefe (University College London, United Kingdom) made a Nobel Prize-worthy discovery: The hippocampus was home to setting-sensitive neurons now known as "place cells." The firing of these cells supports the creation of cognitive maps.

"Cognitive maps predict what you might expect to find around the corner, so to speak," explained Nadel, who would go on to collaborate with O'Keefe in writing the foundational 1978 book on the topic, *The Hippocampus as a Cognitive Map*.

The book was largely interpreted as telling a spatial story about the hippocampus, Nadel continued, but that wasn't quite the whole picture.

"What people didn't exactly cotton on to is that we were really talking about memory the entire time," he explained.

The hippocampus's place cells form the core of a context-dependent memory system — and there are multiple memory systems spread throughout the brain.



“There’s no such thing as *the* memory area; there are memory *areas*, each one of which is responsible for a different form of information,” Nadel said.

These systems vary in content as well as duration. Fortunately for those still waiting for the hippocampus to come online, they have distinct developmental trajectories as well.

A Land Before Hippocampi

No matter how you measure it, virtually no one reports instances of episodic memory from before the age of 2.

From a neurobiological perspective, the late maturation of the hippocampus, and thus the inability to create cognitive maps of our early experiences, plays a significant role in infantile amnesia, Nadel said.

Although species such as deer, antelope, and guinea pigs produce young that are capable of basic functions such as walking, swimming, and finding their own food shortly after birth, most animals are not ready to go right away, Nadel explained. For most species, the hippocampus has a postnatal maturation story. In humans, for instance, the neurons and synapses that make up this seahorse-shaped structure continue to form until a child is 18 to 24 months old, with adult function emerging between 10 and 12 years of age.

In rat pups, on the other hand, hippocampal development occurs in just 18 to 26 days. To an outside observer, it’s an all-or-nothing process. On one day, these pups show no interest at all when placed amid a field of novel objects, and the next they’re scurrying about with curiosity.

“There’s a switch, and then this system is going with respect to exploration,” Nadel said.

A similar switch seems to occur in the human brain as well. In a maze task designed to determine if individuals know where they are in space, Peter Anthony Mangan (Northern Arizona University) and Nadel observed 1- and 2-year-old children as they attempted

to locate a toy hidden amid a circle of identical plates.

After being shown which plate hid the toy, 2-year-olds were able to locate it successfully in the place-based learning condition, in which they were required to start the trial from a randomly chosen point in the room. One-year-olds could complete the task only in the response-based learning condition, where they started at the center of the circle of plates and always found the reward under a plate 45 degrees to their right.

Before you have a functioning hippocampus, Nadel explained, your brain is incapable of place-based learning, but it has other systems to rely on. Thus, although 1-year-olds were not capable of storing information about the plate’s location in space, they could be conditioned to check under a plate that was a certain direction and distance from them.

“The critical point that I want to emphasize is that because the hippocampus is linked to learning in context, everything you learn early in life is going to be context free. It’s not going to be ‘only do this in that context’ or ‘this works in that context.’ It’s going to be only ‘do this or do that, everywhere,’” Nadel said.

Late maturation in various brain regions, including the hippocampus, also renders developing brains susceptible to stress, laying the groundwork for behavioral patterns with the potential to remain with us later in life, he continued.

Learning Under Pressure

Individuals raised in stressful situations and circumstances are often said to have to “grow up quickly.” In the case of hippocampal development, this appears to actually be the case, said Nadel.

Stressing rat pups, whether by shaking them in a box or isolating them from their mothers, has been found to move the onset of exploration, an indicator of hippocampal development, up to several days forward. But while stressed pups may be better equipped to take on the world one-on-one in the short term, this shift in maturation can cause problems down the road.

“Many things are developing simultaneously, and the synchrony and timing of that system is important,” Nadel explained. “If you pull something out of that structure and mistime it, that’s not necessarily a good thing.”

Under ideal circumstances, rats begin life with brains high in plasticity and then develop inhibitory responses that reduce that plasticity as they age. A rat hippocampus that was forced to mature early as a result of exposure to stress does not undergo the same reduction in plasticity, however, Nadel said, and this difference in development is reflected in its behavior as well.

In a task similar to the plate study described above, Nadel and colleagues found that at 6 months old, four out of five rats that were not exposed to early stress were able to successfully navigate a T-shaped maze as it was flipped to different orientations between trials. These rats employed a place-based strategy drawing on the hippocampus, Nadel explained, and learned that they needed to go to a particular place in the T — which could be on either the right or the



Watch Nadel's award address at psychologicalscience.org/observer/nadel.

left depending on how the maze was turned — to receive a reward.

Only two out of five rats that were exposed to stress early in life demonstrated an ability for place-based learning, however. The majority relied instead on a response-based strategy originating outside the hippocampus, causing them to associate actions such as taking a right turn with receiving a reward, even when the maze was oriented so that there was nothing there.

“Early stress, according to all these measures, is doing something with negative consequences for the long-term functioning of the hippocampus,” Nadel said.

This period of developmental sensitivity also makes the hippocampus particularly vulnerable to environmental toxins and chromosomal abnormalities, he continued.

For example, the brains of people with Down syndrome, who are born with an extra chromosome, are known to mature later and to grow to a smaller size. Their hippocampi are significantly smaller than average, even when you correct for differences in brain size, Nadel said.

This reduction in hippocampal size is reflected in these individuals’ inability to engage in place-based learning as well: Nadel and Mangan found that toddlers with Down syndrome are often unable to complete the place-based plate task at 3 or 4 years old, but they can locate the toy in the response-based version of the task. People with fetal alcohol syndrome and those living with the effects of lead exposure can experience similar deficits in hippocampal functioning, he added.

Hippocampal Hypotheses

In the first few years of life before the hippocampus has begun to develop, our brains do a lot of learning in other systems, a significant portion of which will later be shrouded in infantile amnesia, Nadel said.

Individuals who suffer from arachnophobia, for example, often report having no idea why they’re so afraid of

Every time you reactivate a memory, there’s the potential for it to change, and recontextualizing these fear memories in a clinical setting can help alleviate these conditions. The big question, Nadel said, is how to get the effects of this kind of treatment to stick in the long term.

spiders. In some cases, it’s possible that decontextualized memories formed before the hippocampus was prepared to rein in the fearful impulses of the amygdala could form the basis of this and other seemingly inexplicable phobias, he explained.

“These fears that you acquire early in life, because they’re decontextualized, are going to generalize very broadly,” Nadel said.

Further research still needs to be done, but it could be that a similar process occurs during our adult lives as well, Nadel speculated. Particularly stressful or threatening experiences could cause the hippocampus to tap out in favor of the amygdala, enabling the creation of decontextualized fear memories that may be manifest as anxiety or posttraumatic stress disorder.

“Under high stress, [an adult’s] learning may be just like that of an infant,” Nadel said.

Every time you reactivate a memory, there’s the potential for it to change, and recontextualizing these fear memories in a clinical setting can help alleviate these conditions. The big question, Nadel said, is how to get the effects of this kind of treatment to stick in the long term.

On a neurological level, the plasticity of our brains, and thus our ability to reconsolidate these fear memories as adults, comes down to the balance of neurotransmitters in our brains, he explained. Manipulating this balance has already been shown to reopen the critical learning period for functions such as vision, and it may be possible in other areas, as well.

“Memory is way more plastic and dynamic than the field has ever admitted to,” Nadel concluded. “Once we admit that, all bets are off.” ◉

— Kim Armstrong

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DO WE WANT TO BE CREDIBLE OR INCREDIBLE?

Transparency plus scrutiny guarantee that research gets the credibility it deserves. As psychologists, we should know the risks of self-deception better than anyone.

By *Simine Vazire*

Psychological science is at a crossroads. The replicability crisis has turned into a credibility revolution. Many professional societies and journals, including APS, have raised their expectations for transparency and rigor. These early changes are heartening and signal our field's commitment to earning credibility. Those first steps, however, were the easy part.

The challenge facing psychology now is this: Do we want to be credible or incredible? Up until now, we have been able to make important strides in increasing transparency and rigor without giving up much positive attention from the public. Alongside occasional failures to replicate and high-profile retractions, most of the literature continues to make bold claims of groundbreaking discoveries based on research that receives little scrutiny — often because what we'd need to scrutinize it (e.g., data, code, materials, preregistered plan) isn't available. The bit of scrutiny to which we do subject claims, by way of formal peer review, is a black box, and only reviewers, authors, and editors get to look inside. This makes it easy to publish and promote incredible effects — headlines that reach the general public and provide a fleeting moment of positive press for our field — that are likely to shrink or disappear if submitted to scrutiny.



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There is an inherent tension between being incredible and being credible. To be incredible, we have to keep producing eye-catching results at a fast pace. This is easier to do if we don't provide a lot of details. As Buckheit and Donoho (1995) famously wrote, "An article . . . in a scientific publication is not the scholarship itself, it is merely advertising for the scholarship" (p. 5). In this advertisement-only model of science, it's easier to convince ourselves, and others, of incredible results. If no one is going to look under the hood (check reproducibility) or take the claim out for a test drive (check replicability), extravagant claims will thrive (Vazire, 2017). To be transparent is to give our critics ammunition — to share any information about the research process, within legal and ethical constraints, that others might use to identify flaws or errors. What survives that scrutiny is likely to be more credible, but less exciting, ➡

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than in the advertisement-only model.

It's tempting to try to have it all. After all, why not support and encourage incremental improvements in our methods and practices while also celebrating discoveries that follow from the old style of research? Why not let a thousand flowers bloom? Let everyone choose their preferred standards and practices, and see what happens.

The first problem, as we have been made painfully aware, is that this can lead to a proliferation of false-positive results (Camerer et al., 2018; Ebersole, Axt, & Nosek, 2016; Hagger et al., 2016; Klein et al., 2014, 2018; O'Donnell et al., 2018; Open Science Collaboration, 2015; Wagenmakers et al., 2016).

A second problem is that it is very easy to predict what will happen if we let a thousand flowers bloom (and these predictions have been validated by formal models; Smaldino & McElreath, 2016). This doesn't look good for transparency and quality control. If there are no negative consequences for being less transparent, for opting out of scrutiny and accountability, those who opt out will be able to take shortcuts, make bolder claims, and get more rewards. The more transparent researchers whose errors get caught and corrected will lose the race for jobs, tenure, grants, and prizes.

In a system in which we frequently have to compare research outputs across candidates (e.g., for jobs, awards, grants), how should we compare the researcher who transparently reports all analyses, studies, and results and therefore has a messy or boring story to tell with the researcher who tells us that they have a strong and compelling set of results but doesn't give us the information we'd need to verify this claim? If we give the second researcher the benefit of the doubt, we are de facto punishing the first researcher. In a system in which opacity is the acceptable default, there is no way to survive as a transparent researcher.

Of course, we should not assume that transparent research is good re-

When research isn't transparent, we should refuse to ascribe to it any particular level of credibility; letting nontransparent research enter the competition ensures that transparent research will get crowded out.

search. But we don't have to — that's the point of transparency. Transparency is for scrutiny, critique, and correction. We shouldn't assume transparent research is rigorous, we should evaluate whether it is. Transparency doesn't guarantee credibility; transparency and scrutiny together guarantee that research gets the credibility it deserves. When research isn't transparent, we should refuse to ascribe to it any particular level of credibility; letting nontransparent research enter the competition ensures that transparent research will get crowded out.

Another problem with the live-and-let-live approach is that it ignores our responsibility to the public. At least in the United States (Funk, Heffron, Kennedy, & Johnson, 2019), the public has a great deal of trust in science, but the same survey also suggests that the public doesn't trust individual scientists and expects us to hold each other accountable. Take, for example, the very low proportion of respondents who said they trust medical, nutrition, and environmental scientists to "admit and take responsibility for mistakes" (13%, 11%, and 16%, respectively) or to "provide fair and accurate information" (32%, 24%, and 35%).

How is it possible that almost 9 out of 10 Americans do not agree that medical researchers admit and take responsibility for their mistakes, yet 86% trust science? One clue is the finding, from the same Pew survey, that 57% of Americans say they would trust research more when the data are openly available (vs. 8% who say they would trust it less and 34% who say it makes no difference). The public doesn't trust us as individuals, but they trust science because of the expectation of transparency and accountability. If we continue to make transparency and quality control optional — which we effectively do when we continue to give our seal of approval (and put out press releases) for research that is not transparent and has not passed through careful scrutiny — we are putting our long-term credibility in jeopardy. We may score more points in the short term by putting out more frequent and dramatic headlines, but we risk losing credibility in the long term when the public realizes we don't make transparency and verification requirements for endorsing such claims.

I understand the appeal of using carrots and not sticks. It's unpleasant to punish researchers who sincerely believe that their practices are rigorous. But we now know that practices that we believed were rigorous turned out to be error-prone; we now know that we need more than a "trust me" from the researcher, however sincere they are. Researchers should not be able

to exempt themselves from outside scrutiny — as psychologists, we should know better than anyone the risks of self-deception. Given that we now know that transparent reporting is vital for catching and correcting errors, the public won't (and shouldn't) be sympathetic if we want to let every researcher choose their own level of transparency, simply because we don't want to step on anyone's toes.

There are still many details to work out. What kind of transparency is most important for detecting and correcting errors? What if we make things more transparent, but no one wants to do the thankless work of checking for errors? As Vonnegut said, “everyone wants to build, nobody wants to do maintenance” (1997, p. 167). Which kinds of errors should most concern us? These are questions for methodologists and metascientists to figure out, with help from experts in sociology, history, and philosophy of science.

But we cannot wait until these details are settled to decide how serious we are about our commitment to credibility. Are we willing to reserve bold claims of discovery for findings that are transparently reported and withstand the scrutiny and verification that transparency invites? Are we willing to forego the positive attention we get from media coverage of claims that were never put to a severe test? It will be painful at first, but the knowledge we'll produce in the long run will be better than incredible — it'll be credible. ●

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TEACHING STUDENTS ABOUT TRIBAL ANIMALS

By C. Nathan DeWall

Clark, C. J., Liu, B. S., Winegard, B. M., & Ditto, P. H. (2019). Tribalism is human nature. *Current Directions in Psychological Science*, 28(6), 587–592. <https://doi.org/10.1177/0963721419862289>

On Thursday, July 25, 2019, President Donald Trump made a phone call that rocked the stability of his presidency. Chatting with the newly elected president of the Ukraine, Volodymyr Zelensky, Trump requested two favors in return for already-approved U.S. military aid: (a) to investigate former Vice President Joe Biden and his son, Hunter Biden, along with a company on which Biden's son served as a board member, and (b) to look into a conspiracy theory that Ukraine, rather than Russia, had intervened in the 2016 U.S. Presidential election.

The Trump administration released portions of the phone-call transcript. What followed, according to Cory Clark, Bo Winegard, and Peter Ditto (2019), was a clear case of psychological tribalism. Most U.S. liberals viewed the phone call transcript as clear evidence of high crimes and misdemeanors, which led to impeachment proceedings against President Trump. US conservatives were unimpressed with the phone call transcripts and accused liberals of overreacting.

An October 2019 Pew survey reported that the United States was almost evenly split: 54 percent approved the

decision to pursue impeachment proceedings. How could people view the same piece of information so differently?

Clark and colleagues (2019) argue that evolutionary science helps make sense of this kind of tribalism. Cognitive biases that promote group loyalty help people to survive and reproduce. Even if biased thinking led people astray, this downside would be offset by the immense benefits that accompany loyal groups. Because liberals and conservatives faced matching selecting pressures, they have a shared biology make-up. Hence, differences between political groups should be expected and are mostly psychological rather than biological. Humans are tribal animals.

“Tribalism is a natural and quite possibly an ineradicable element of human social groups,” Clark said. “It is likely that all groups, and all people within those groups, are susceptible to tribalism and tribal biases.”

A 2018 meta-analysis of 51 experiments supported the tribal animal hypothesis (Ditto et al., 2018). Across all experiments, liberals and conservatives viewed study results they favored as more believable. Both groups showed bias, at equivalent levels.

To bring this provocative research into the classroom, ask students to complete the following two activities. Clark designed these activities to show students how partisan bias is a normal part of human psychology. Because politics can introduce discomfort and controversy, remind students that their responses will remain anonymous.

Clark asks students to consider the following fictitious study:

In math-intensive fields such as the physical sciences, computer science, and engineering, women are underrepresented. Lately, social scientists have become very interested in understanding why women are underrepresented in these fields. Could this difference be due to differences in math ability?

A study at Yale University followed 100 males and 100 females from a nearby school from first grade through twelfth grade. Each year they assessed the students' math and science abilities on standardized tests as well as other cognitive abilities related to math skills (e.g., mental rotation).

Once students have read about the study, ask half of the class to close their eyes while the other half reads the following (males-performed-better condition):

The results indicated that male students outperformed female students starting as early as first grade and this difference was stable over time.

Repeat the same procedure, except this time ask the other half of the class to close their eyes and the remaining students to read the following (no-gender-differences condition):

The results indicated that there were no differences between male and female students in math ability.

For all students, ask them to evaluate the study using these questions:

How valid were the study methods?

Responses could range from 1 to 9, from not at all valid to extremely valid.

How sufficient was the sample size?

Responses could range from 1 to 9, from not at all sufficient to extremely sufficient.

Have students average their responses to these two questions to create an overall *study-quality score*. Instructors can tally students' scores, making sure to label the condition to which students were assigned. If time permits, instructors can draw the results on a whiteboard. Otherwise, show students results from Clark's class on the same activity, which likely mirror their own responses:

Ask the class to consider these results. How could people view study quality so differently given these results? How does such a perceptual bias — to view data through a biased lens of personal beliefs — affect how people think, feel, and interact with others? What can we do to address these sorts of biases?

The second activity is a memory test using a scale from 1 to 7, from not at all to extremely.

How politically liberal do you consider yourself?

How politically conservative do you consider yourself?

If he runs, how much would you support Bernie Sanders in the 2020 Presidential Election?

If she runs, how much would you support Hillary Clinton in the 2020 Presidential Election?

How much would you support Donald Trump in the 2020 Presidential Election? Next, ask students to report whether they remembered seeing or hearing about the following news headlines:

Bernie Sanders in 1968: His Days in the Peace Corps

Trump Fires Housekeeper for Calling Him Donald Instead of Mr. Trump

Recordings Surface of Hillary Saying Some Poor Are Just Lazy

Write down how many students reported remembering each news headline. Instructors can then inform students that each news headline was fake. Who remembered the headlines most? Those who would support Bernie Sanders in the 2020 Presidential election? Clark completed this activity, and her class results were as follows:

Bernie Sanders in 1968: His Days in the Peace Corps

Sanders supporters: 29% remembered

Non-Sanders supporters: 0% remembered

Trump Fires Housekeeper for Calling Him Donald Instead of Mr. Trump

Sanders supporters: 14% remembered

Non-Sanders supporters: 0% remembered

Recordings Surface of Hillary Saying Some Poor Are Just Lazy

Sanders supporters: 43% remembered

Non-Sanders supporters: 0% remembered

Again, ask students to discuss these findings. How do people's political beliefs influence their propensity to believe false news? On the other hand, how might people's political beliefs lead them to believe that accurate news is actually false? How might this biased perception affect how people with different political beliefs interact with one another?

Teaching students about tribalism can aid their critical thinking. By understanding how we evolved certain biased perceptions, students can better understand themselves, their fellows, and their global community.

"Tribalism and tribal biases do not only affect our outgroups," Clark notes. "They likely affect *all* groups: mine, yours, and everyone else's. We are all humans, and thus we are all susceptible to these kinds of biases." ●

See this article online for results from Clark's trial of this activity.

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EDITED BY C. NATHAN DEWALL AND DAVID G. MYERS

Teaching *Current Directions in Psychological Science* offers advice and guidance about teaching a particular area of research or topic covered in this peer-reviewed APS bimonthly journal, which features reviews covering all of scientific psychology and its applications. Visit this column online for supplementary components, including classroom activities and demonstrations:

psychologicalscience.org/publications/teaching-current-directions.

GETTING STUDENTS INTERESTED IN BOREDOM

By Beth Morling

Westgate, E. C. (2019). Why boredom is interesting. *Current Directions in Psychological Science*. Advance online publication. <https://doi.org/10.1177/0963721419884309>

Imagine sitting in a chair for 10 minutes with nothing but your own thoughts. You aren't allowed to fall asleep, but you can think about whatever you want. By the way: You're holding a novelty toy that delivers shocks — if you want to, you can shock yourself while you sit there. Do you think you would do it?

People have reportedly done worse than self-shock out of boredom: Some bored employees started a fire while cremating a mouse; a bored security guard handcuffed himself. According to research, these bored troublemakers should have changed their situation's cognitive demands, made the situation more meaningful, or both.

Use a clicker poll to ask your students if they'd shock themselves under these circumstances. The subsequent discussion will be lively. As it turns out, a body of evidence on boredom has found that most people actually *do* shock themselves when they are bored (e.g., 15 to 20 times an hour on average; Nederkoorn et al., 2016). But why?

In her recent *Current Directions* article, Erin Westgate explains that boredom, like all emotions, provides information. Boredom informs us that “there's no point doing something anymore — something needs to change.”

Westgate's theory of meaning and attentional components (MAC) identifies the two appraisals that lead to boredom. One is meaning: Activities that are *irrelevant to our goals* are more boring — the message is “this is not worth doing.” The second appraisal is attentional: Activities that *mismatch our attentional resources* are boring. A task that's too easy will usually be boring, of course. But so is a task that's overwhelming: Boredom in response to the too-challenging task says, “there's no point trying this task — you don't have the resources.” Indeed, when people say, “I wish I were bored more often” it probably means they are chronically overchallenged.

According to MAC theory, some people would find 10 minutes of alone time boring (and would self-administer shock), in part because the task seems meaningless and in part because it is not challenging. People might instead increase meaning during the 10 minutes by practicing prayer or meditation. They might increase the challenge by mentally planning a project.

Westgate and Timothy Wilson (University of Virginia) tested MAC in a 2 × 2 study (2018). Participants were randomly assigned to perform 600 trials of an easy versus optimally challenging air-traffic-control activity. The easy condition required few attentional resources; the optimally challenging condition required many. In addition, half of participants were told their correct responses would donate money to a charity, thereby manipulating meaning. As the theory predicted, people reported being least bored in the meaningful and optimally challenging condition and most bored in the meaningless and too-easy condition. The dimensions were additive (they did not interact). Therefore, a meaningful task will still be boring if it's too easy, but a meaningless, optimally challenging task can be boring as well.

Research on boredom can be useful to teachers, who calibrate both challenge and meaning in the classroom. Our students might check out if they find the work overwhelming, so teachers can adjust task difficulty by helping students develop the skills they need. They can reduce the task's cognitive load by offloading some information into a slide or handout. For unavoidably easy tasks, teachers can increase meaning: Connect content to future job skills, design service learning, or link lessons to students' personal lives.

Teaching Boredom

In an introductory or social psychology course, the MAC theory of boredom can help you introduce appraisal theories of emotion. According to appraisal theories, emotions are not identified by their outputs but by their inputs. Westgate (2019) compares it to medical diagnosis: We determine strep infection not by throat pain, but by the presence of relevant bacteria. Similarly, emotions

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are diagnosed not by how they make people *feel* or *act*, but by the appraisals that led to them. Anger is caused by the appraisal that someone has violated your boundaries; happiness can be caused by the appraisal that your goal progress is better than expected (Clore 2009; Carver & Scheier, 1998). In turn, boredom is caused by the appraisal of attentional resources and meaning. Students tend to struggle with the appraisal concept. It may help to point out that when people are angry, their outputs vary a lot — your students can probably come up with several behaviors and faces they may make when angry. Nevertheless, the core appraisal — personal violation — is the same for all anger.

To help illustrate how appraisals cause emotions, use the experiment that manipulated appraisals and caused the emotion of boredom. Westgate has provided slides demonstrating the study (<https://tinyurl.com/qplxapb>). Walking through the slides, students first experience the too-easy air-traffic-control task (and imagine doing 600 trials of it), and then try the one requiring attentional resources. The second factor — meaning — was operationalized via a charity donation versus control.

Walk students through the two appraisals by asking, Which condition should have higher meaning? Which condition should require optimal attentional resources? Students can set up the axes on the figure, and sketch predictions based on the theory, before you show the results (Figure 1).

In research methods, the MAC model's two dimensions can help you introduce factorial designs; the theory predicts two main effects but no interaction. Boredom research also provides a fresh example of a curvilinear relationship: Tasks that are too easy and too hard result in boredom (Figure 2).

In short, you'll be shocked to learn how interested students will be in learning about boredom. ●

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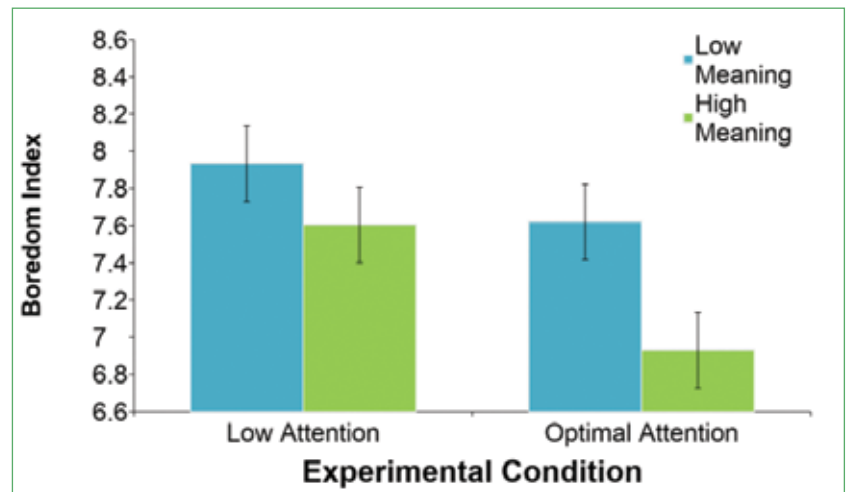


Figure 1. Results of the 2×2 study manipulating task difficulty and meaning (Courtesy Erin Westgate).

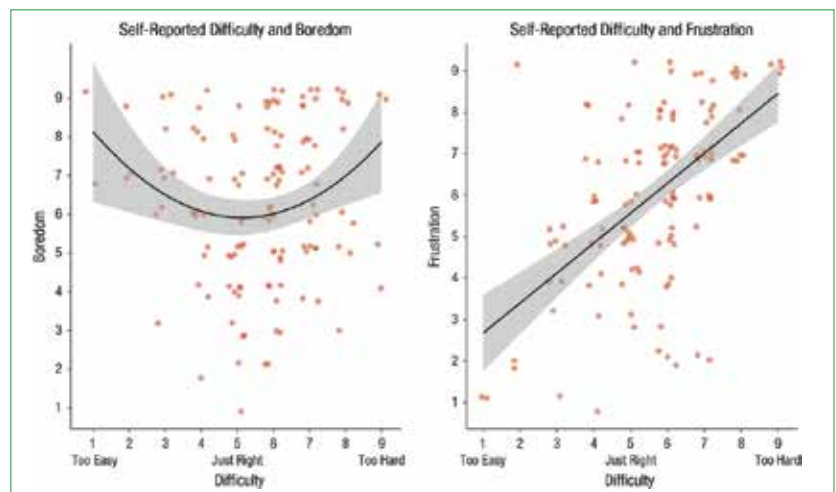


Figure 2. The curvilinear relationship between attentional resources (i.e., difficulty) and boredom. (Source: Westgate & Wilson, 2018).

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Questions?

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CONSIDERING LIFE ON THE “OTHER SIDE”

One doctoral student’s summer in tech

By *Tim Valshtein*



Tim Valshtein
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If you’ve spent any time reading about or discussing the academic job market recently, then you already know how the story goes — tenure-track jobs are scarce, and the numbers seem only to be getting bleaker. As might be expected, the reasons for this trend are complex. But as long as competition for tenure-track jobs increases, so, too, will graduates continue to find meaningful work elsewhere, particularly as industry demand for behavioral science PhDs increases. User experience (UX) research and related careers in the tech industry represent one alternative to the traditional academic route.

This past summer I interned as a UX researcher at a tech company and got a taste of what postgraduate life might look like outside academia. Many doc-

toral students seem to be curious about this world, and I hope that communicating what I learned can provide value to those in search of answers. I’m far from an expert on the machinations of industry — I never intended to do an internship and, in total, I spent only 12 weeks in this position — but the experience recontextualized everything I’ve learned as a doctoral student thus far.

Effectively plotting one’s course toward a career in UX likely merits its own article, and there is an abundance of material on preparing for the interviews themselves. But in brief, three pieces of advice seem especially appropriate.

- Become conversant in the basic principles and terminology of human-centered design, the assumptions surrounding research for business decision-making, and the typical problems encountered therein (e.g., usability research, A/B testing). This will help immensely when it comes to framing your skills during interviews.
- Consider your research identity and double down on it. Regardless of what research methods you enjoy, try to develop them as much as possible and decide whether you aspire to be a qualitative, quantitative, or mixed-methods researcher — all are valued in industry.
- If you know industry is of interest to you, communicate this to your academic support system as early as possible. While talking about your career aspirations with a mentor can be daunting, it will ultimately pay huge dividends. Mentors want their students to succeed and will be best equipped to provide support if they know what training you want and what opportunities will appeal to you.

My UX internship constituted a period of immense learning and growth, some of which felt familiar to my life as a graduate student. For example, the company where I interned had a strong culture of learning and mentorship on par with or exceeding the academic world. Everyone — not just interns — was encouraged to develop new skills ranging from methods to statistical packages and beyond. I was also excited to see that there are opportunities to teach (in the form of in-house workshops) and mentor more junior researchers. We even had research summits for researchers to disseminate their work to others around the business.

However, many aspects of industry operate very differently from academia. I found it especially challenging to orient myself to the radically different assumptions of industry research. While the standard for quality was rigorous, the purpose of research is different. Often, the research process begins with a decision to be made, and that subsequently dictates the kind of research to be conducted. Everything that follows from the initial decision to be made is based on priorities and strategies that are completely foreign in academic research. Generalizability only matters

Tim Valshtein is a fourth-year PhD student in social psychology at New York University and a member of the APS Student Caucus board. He is interested in understanding motivation and self-regulation in romantic relationships and, in particular, the mechanisms that explain why some people (typically men) struggle to move on from their romantic interests. He can be reached at valshteint@nyu.edu.

insofar as the decision is concerned, and theory building is irrelevant unless it makes for better decisions. Because business decisions are highly time sensitive, research needs to be conducted at an equally blistering speed, sometimes at the expense of producing polished work. That means you will need to communicate work in progress clearly and effectively to diverse stakeholders, on a moment's notice.

Working as a UX researcher — unlike an academic scholar — is a job and nothing more. Of course, many people I encountered were deeply passionate about their work and even dedicated long hours to their research (though this wasn't the norm). Generally speaking, though, you are merely an employee doing work to make your employer successful. The implications of this are two-fold. There is something *truly* liberating about leaving work at the office — no more waking up in the middle of the night to jot down study ideas, and no more equating the success of your research with your success as a *person*. But what made UX work easy to walk away from is precisely what made me begin to miss my academic research, too. As is the case for many academics, I feel a profound connection to my

research, and by the end of my internship, I felt ready to continue doing work that added social value to the world, above and beyond the (admittedly, much larger) immediate impact I had on the business during my internship. How you handle these dynamics will likely bear heavily on whether UX research is for you.

This brings up a related point. At the end of the day, tech companies are businesses — and in business, generating impact means your research (whether indirectly or directly) needs to help the company grow. In contrast, academics are ostensibly free to pursue whatever research they deem meaningful, unhindered by profit margins. On the one hand, this means that UX research's impact is direct, sizeable, and measurable. On the other, the nature of that impact is necessarily bound by profit. I found myself questioning whether I was comfortable with using my research skills to these ends, especially in light of the serious ethical issues in which many tech companies are embroiled.

The internship was a beneficial source of professional development for me. In academia, we work for years before being able to tangibly measure our success. Often, I was the only person in a given room with my skillset, and my team regularly made a point of recognizing this, justifying my decision to pursue doctoral education in the process. Of course, doing a full-time summer internship — and shirking nonessential academic responsibilities — was not without its challenges. Reacclimating to academic life took months. But when I finally returned to campus, I felt reinvigorated by my research, found my writing — to be clearer than ever, and had newfound clarity in what I value in a career.

In many academic circles, there seems to be a pervasive impulse to dichotomize graduates into those who “made it” by persisting in academia and those who “failed” by pursuing a career elsewhere. This attitude serves only to curb the advancement of our field and the intellectual development of our brightest graduate students. Like most who pursue doctoral study, landing a tenure-track professorship remains a dream of mine. Yet the odds of this actually happening are slim. Completing a UX internship validated and expanded the skill set I've spent years developing and showed me a future wherein I can have a meaningful career, even if it happens to be in one of the many viable industries outside of higher education. I'm not sure a career in UX research is the perfect fit for me, but it might be for you, and our field should continue to encourage such exploration. ●



Student Notebook serves as a forum in which APS Student Caucus members communicate their ideas, suggestions, and experiences. Read other Student Notebook columns at psychologicalscience.org/studentnotebook, and learn about the benefits of Student Membership at psychologicalscience.org/members/apssc.

Related Reading

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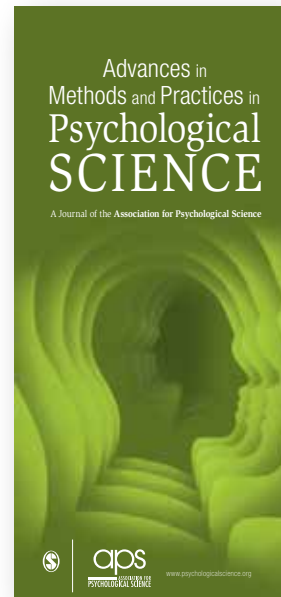
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The James McKeen Cattell Fund provides support to supplement the regular sabbatical allowance provided by the recipients' home institutions.

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For more information, see the ad on p.42 or visit cattell.duke.edu.

Psychological Science and Entrepreneurship Poster Award at APS 2020

The Psychological Science and Entrepreneurship Poster Award will recognize the contributions of students and early-career scientists conducting research at the intersection of psychological science and entrepreneurship. Apply for the award when submitting your poster for the 2020 APS Annual Convention in Chicago.

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For more information, visit: psychologicalscience.org/publications/observer/obsonline/coming-soon-psychological-science-and-entrepreneurship-poster-award-at-aps-2020.html

January and February 2020 NSF Grant Submission Deadlines

Apply today to NSF programs that support psychological science.

View application deadlines for 2020 on the APS website.

Visit psychologicalscience.org/policy/january-and-february-2020-nsf-grant-submission-deadlines.html.

2020 RAND Summer Institute

The 27th Annual RAND Summer Institute will be held July 6–9, 2020, in Santa Monica, CA.

The RAND Summer Institute will consist of two conferences addressing critical issues facing our aging population: Mini-Medical School for Social Scientists; and a Workshop on the Demography, Economics, Psychology, and Epidemiology of Aging. Interested researchers can apply for financial support covering travel and accommodations.

Application Deadline: March 16, 2020

Visit RAND's website for more information and the application form: rand.org/well-being/social-and-behavioral-policy/centers/aging/rsi.html.

Multinomial Processing Tree Modeling Workshop

A Multinomial Processing Tree (MPT) Modeling preconference workshop will run March 21 to March 22, 2020 at the 62nd Conference of Experimental Psychologists in Jena, Germany.

The 2-day workshop will provide a systematic and application-oriented overview of the basics and the most recent developments in MPT modeling.

For more information, visit teap2020.dryfta.com/79-program/87-pre-conference-workshop.

This workshop is supported by the William K. & Katherine W. Estes Fund, a fund jointly overseen by APS and the Psychonomic Society to support summer schools and workshops offering training in mathematical and computational modeling.

MEETINGS

32nd APS Annual Convention

May 21–24, 2020

Chicago, Illinois

psychologicalscience.org/conventions

4th International Convention of Psychological Science

March 25–27, 2021

Brussels, Belgium

psychologicalscience.org/conventions/icps

2020 Cognitive Aging Conference

April 16–19, 2020

Atlanta, Georgia

cac.gatech.edu

International Society for the Study of Behavioural Development 2020 Conference

June 21–25, 2020

Island of Rhodes, Greece

issbd2020.org

2020 Society for Affective Science Conference

April 23–25, 2020

San Francisco, California

society-for-affective-science.org/

Biennial International Seminar on the Teaching of Psychological Science

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Thomas Beckers
KU Leuven, Belgium

NEVER FEAR?

It may sound like he's inducing amnesia, but psychology professor **Tom Beckers** is actually testing the possibility of targeting and muffling psychologically crippling memories.

What specifically led to your scientific interest in fear-provoking memories?

I have always been interested in basic issues of learning and memory — what we take away from important moments in our lives shapes our sense of self and how we deal with future situations. While our ability to vividly remember past events with great emotional impact is vital to successful living and well-being, such memories can occasionally cause considerable suffering and contribute to depression, anxiety, or other psychological problems. Think for instance of posttraumatic stress disorder, where the sight or sound of a stimulus that is associated with a traumatic incident can trigger massive memory retrieval and reliving of the traumatic experience.

Tell us about the objectives of the WipeOutFear project that you're heading up.

Findings from lab experiments suggest it may be possible to make people selectively forget aspects of

past events that they previously remembered, through behavioral interventions or the administration of specific pharmacological agents after targeted memory retrieval (so-called reconsolidation interference). However, the translation of targeted forgetting from the lab to the clinic has met with limited success, partly because we don't fully understand the mechanisms and conditions governing such reconsolidation interference. In the WipeOutFear project, we are trying to dissect the nature of pharmacologically induced amnesia, through research in humans and rodents, in order to identify barriers to clinical translation and their possible solutions, all the while separating facts from fiction and promise from hype.

What findings has the project yielded thus far?

One thing we have found is that targeted memory suppression is not always readily replicated, even when sticking closely to protocols of previous successful demonstrations. Overall, it turns out that memory representations may not be that readily malleable. When a memory is retrieved, it seems that only if there are signals present that indicate that the memory is not entirely accurate does its representation become malleable and sensitive to suppression.

Other findings from the project suggest that these amnesic interventions don't permanently "erase" a memory representation. Rather, these targeted

memory-suppression techniques seem to make memory representations harder to access.

What are some potential real-world implications for fear suppression?

One upshot of our findings is that the results of these types of amnesic interventions are less drastic than often proclaimed, given that they seem to suppress rather than erase memory. This reduces a number of ethical concerns regarding their clinical application. On the other hand, it is clear that our understanding of the mechanisms that govern such amnesia is far too limited to allow solid clinical translation for now. Unfortunately, our limited understanding of these and related issues hasn't stopped some people from marketing the principle of reconsolidation interference and making bold claims regarding its effectivity.

Are there any fears of your own that you'd like to suppress?

I'm not particularly fearful myself. I do have plenty of memories of unpleasant and troublesome events, as does anyone who has been on this planet for long enough. But those memories are an integral part of who I am, and while thinking back to those events may make me sad at times, just like others can make me very happy, I'd rather hold on to them — they do not hold me back or impair me in my day-to-day life. After all, as I said, memory (even for negative events) mostly serves us well. ●



Read the full interview online at psychologicalscience.org/observer/never-fear.

Learn about the WipeOutFear project at kuleuven.be/english/research/EU/p/horizon2020/es/erc/wipeoutfear.

Back Page showcases particularly interesting work by a wide variety of psychological scientists. Know of a good candidate for a future profile? Contact the *Observer* at apsobserver@psychologicalscience.org.

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