

Observer

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Interoception

How We Understand Our
Body's Inner Sensations



INSIDE

- Universal Design for Inclusive Science
- Advice for New Faculty
- Connecting the Dots Between Biology and Addiction

PLUS

ZOMBIE IDEAS



Observer

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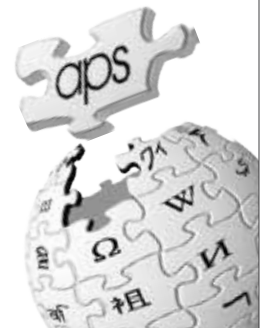
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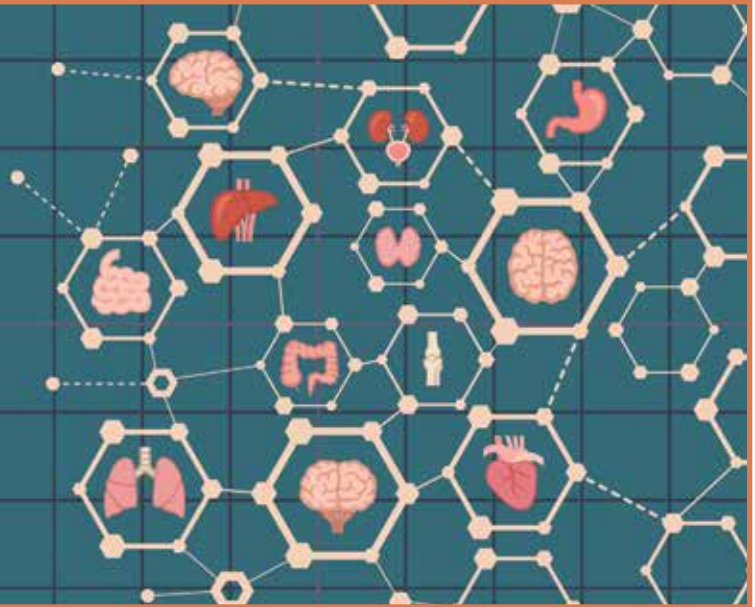
FEATURES

Interoception

How We Understand Our Body's Inner Sensations

The feel of our heart beat, the rumble of an empty stomach, the pleasure of a deep breath. Interoception — the ability to perceive the internal state of our bodies — is central to our thoughts, emotions, decision-making, and sense of self.

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5 *Presidential Column* *Zombie Ideas*

In this season of ghosts, witches, and everything spooky, APS President **Lisa Feldman Barrett** takes aim at the hordes of mistaken beliefs she sees continuing to haunt psychological science.

21 *Universal Design for Inclusive Science*

Individuals with disabilities are often excluded from research participant pools. Psychological researcher **Nazanin M. Heydarian** highlights some resources that can enhance accessibility and inclusiveness in lab experiments.

12 *2020 APS William James Fellow Awards*

APS Past Board Member **Susan A. Gelman**, **Carol S. Dweck**, **Neil Burgess**, and **Andrew N. Meltzoff** are honored for their lifetimes of achievement in the basic science of psychology.

29 *Hacking the APS Convention*

Hackathons started in the tech industry, but scientists are working to modify them into open-science collaborations that would be right at home at APS Annual Conventions.

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It's your first faculty job. Now what do you do? A panel of three psychological scientists who have been there, done that offer some advice.

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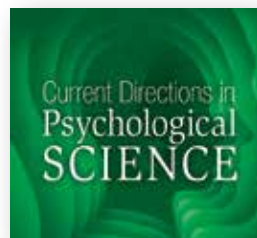
APS Fellow **Brad Wyble** of Pennsylvania State University, **Andrea Halpern** of Bucknell University, and **Clayton Curtis** of New York University are recipients of fellowships that allow them to extend sabbatical periods for research.

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Increasing Knowledge of Psychological Concepts With Family History Research
When it comes to helping students understand basic psychological concepts, **Nickles Chittester** is keeping the curriculum all in the family.

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"Digital-Media Use and Mental Health: A Teachable Example of Psychological Science Shining Its Light"
by **David G. Myers**

"She sounds nice!"
by **Beth Morling**



45 *Back Page*
Connecting the Dots Between Biology and Addiction

With \$2.3 million from the National Institutes of Health, Emory University psychological scientist **Rohan Palmer** is searching for the genetic influences that leave some individuals particularly vulnerable to addiction.



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A photograph of a Chicago river scene with a yellow ferry and a white tour boat. A large white circle is overlaid on the image, containing the APS logo and event information.

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Fred Kavli Keynote Address

Ways to Think About the Brain

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.



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

Hanna Rosin (Discussant)

NPR

Eran Halperin

The Hebrew University of Jerusalem, Israel

Alix Spiegel (Discussant)

NPR

Manos Tsakiris

Royal Holloway, University of London, United Kingdom



Bring the Family Address

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.



Saturday Keynote Address

Jennifer L. Eberhardt

Stanford University

Eberhardt 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.”

ZOMBIE IDEAS

It's October, a month auspicious for All Hallow's Eve and everything spooky. Accordingly, our topic for this month is ... zombies. Not the charmingly decayed corpses you encounter in movies and books, but *zombie ideas*. According to the economist Paul Krugman (2013), a zombie idea is a view that's been thoroughly refuted by a mountain of empirical evidence but nonetheless refuses to die, being continually reanimated by our deeply held beliefs.

Zombie ideas abound in our culture, nibbling away at the brains of their victims. The mistaken belief that vaccinations cause autism — a celebrated zombie idea — is responsible for rising rates of vaccine-preventable diseases. The belief that a person's personality type, assessed by the Myers-Briggs Type Indicator (MBTI), predicts job performance is another zombie idea that continues to lure otherwise capable managers into making decisions that benefit neither employees nor their companies.

If you think that formal science training will zombie-proof your mind, you're out of luck, my friend. Hordes of zombie ideas flourish in science (Brockman, 2015). They also fester in our own field, quietly biding their time in peer-reviewed papers and textbooks, waiting to infect another generation of unsuspecting psychological scientists.

For example, evolutionary psychologists have argued for years that waist-to-hip ratio is a phenotypic cue to reproductive success. I've always felt 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! But I'd heard this claim repeated enough times that I assumed the empirical case was a done deal. The logic goes like this: Men supposedly prefer women with relatively smaller waists and broader hips, which supposedly aids conception and childbirth and, in turn, increase the males' reproductive success. Nevertheless, there is no evidence that healthy women with larger waist-to-hip ratios are less fecund or fertile than women with smaller ratios (Bovet, 2019). It's a zombie idea. Ditto for the "*body symmetry*" hypothesis, which survives despite the empirical evidence (Jennions & Møller, 2002; for cogent analysis, see Prum, 2017).

In honor of Halloween and the first MetaScience symposium, exploring the science of doing science, I asked the APS staff to canvas APS members for zombie idea sightings. Alison Gopnik, a developmental psychologist, nominated "the nature/



Lisa Feldman Barrett
APS President

nurture distinction" as an undead idea that will not expire. "It's commonplace in both scientific and popular writing to talk about innate human traits, 'hard-wired' behaviors or 'genes for' everything from alcoholism to intelligence," writes Gopnik, in an aspirational obituary (Gopnik, 2016). She points to growing evidence, including the research of neurologist Michael Meaney, for the many complex ways that environmental factors govern gene expression and protein construction (i.e., epigenetics). There is also increasing evidence that certain genes tune, for better or for worse, the extent to which a person's genes are sensitive to environmental impacts (so-called orchids vs. dandelions; for a review of evidence and discussion, see Boyce, 2019). And developmental neuroscience evidence clearly shows that infant brains wire themselves to their physical and social surroundings. These findings show that nature requires nurture, and nurture has its impact via nature. The two are biologically entwined and cannot be discussed in either-or terms or as independent factors that interact.

Joshua Buckholtz, a clinical neuroscientist, nominated the "hydraulic model of self-control," the idea that within each of us lurks ancient brain circuits that, when triggered, cause us to do stuff that we later regret (more colorfully referred to as the four Fs — fighting, fleeing, feeding, and . . . sex). Our prodigious prefrontal cortex allegedly puts the brakes on our inner beast, protecting us from worst selves, and impaired self-control in psychological disorders is thought to result from a faulty brake. Buckholtz points out that this idea should have remained buried by mountains of neuroanatomy evidence showing that the relevant brain circuitry is not structured in a way that makes the

APS President **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. Feldman Barrett can be contacted at lfeldmanbarrett@psychologicalscience.org.

hydraulic model plausible (e.g., Haber, Kim, Maily, & Calzavara, 2006; Bilder, Volavka, Lachman, & Grace, 2004), not to mention the accumulating evidence that self-control, in and of itself, is a value-based choice (Berkman, Hutcherson, Livingston, Kahn, & Inzlicht, 2017; Buckholz, 2015).

The hydraulic model of self-control is a close cousin to another zombie, the *triune brain*, the idea that evolution laid down brain circuitry like sedimentary rock, with reptilian, limbic, and neurocortical layers. It has been known since the 1970s in evolutionary and developmental neuroscience that this story is a myth (Striedter, 2005). Think about this the next time you read that emotions erupt from neurons in the amygdala and other parts of the fabled limbic system, or that rational thought emerges in the neocortex, with one struggling to regulate the other.

Here's a shocker from APS Fellow Sari van Anders, social neuroendocrinologist: It's time to bury the idea that "male" and "female" are genetically fixed, nonoverlapping categories (i.e., natural kinds). Evidence from numerous disciplines fundamentally disconfirms this common-sense view (Hyde, Bigler, Joel, Tate, & van Anders, 2019). For example, a variety of neuroscience findings refute sexual dimorphism of the human brain. Behavioral neuroendocrinology findings similarly challenge the notion that male and female are natural kind categories. Research from developmental and cultural psychology also suggests that our view of these biological categories as fixed and immutable is learned, malleable, and culturally variable. (For additional evidence and cogent analysis, see Dreger, 2000, 2015; Fine, 2010, 2014).

Our final example of a dead idea that continues to roam the psychological landscape is that people can read emotions in other people's faces, because certain configurations of facial movements, commonly called "facial expressions," reliably and specifically signal a specific emotional state. A team of five senior scientists (including myself) met weekly for over 2 years, reviewing more than 1,000 publications related to this topic. We began with starkly different priors, but nonetheless came to consensus over what the data show, and we published our conclusions in the July 2019 issue of *Psychological Science in the Public Interest* (Barrett, Adolphs, Marsella, Martinez, & Pollak, 2019). People do, indeed, spontaneously smile in happiness, frown in sadness,

scowl in anger, and so on, more than would be expected by chance, but not with sufficient reliability or specificity across contexts, individuals, and cultures for these facial configurations to be considered prototypic displays of any emotional state.¹ Nor do human perceivers infer emotions from particular configurations of facial muscle movements in a reliable and specific way (once certain methodological factors are considered and controlled). For example, a wide-eyed gasping face is not *the* facial expression of fear but is *one of many* configurations that can express fear, and frequently does not express fear at all. Human facial movements are much more variable than previously assumed, and the effects of context and culture have been insufficiently documented and accounted for in published experiments. Have your zombie detector ready the next time you encounter terms like "emotional displays" to refer to how people move their faces when they are emotional and "emotion recognition" to refer to how people infer the emotional meaning in facial movements.

To kill a zombie, you generally lop off its head or destroy its brain in some permanent way. Luckily, you don't have to decapitate yourself to stop zombie ideas from eating your brain or infecting other psychological scientists. Instead, deploy the most powerful anti-zombie vaccine: curiosity (Firestein, 2012, 2015). Be curious about evidence that seems to disconfirm your strongly held hypotheses. Being wrong is an opportunity to discover something new.

So this October, be brave: Take a deeply held belief and put it to the test. Search for empirical evidence that it might be wrong. Seriously entertain at least one alternative hypothesis during your hunt. If you do, you might just uncover a zombie infestation. ●

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¹This evidence largely comes from people living in larger scale, urban cultural contexts; there are no peer-reviewed, published studies that systematically observe spontaneous facial movements during emotional events of people from small-scale, remote cultures.

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

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To be eligible for this year's awards, candidates must not be on sabbatical at any time during the Academic Year 2019–2020. Sabbaticals must be for the Academic Year 2020–2021.

Questions?

Christina L. Williams
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The deadline for submissions is January 15, 2020.

Applications may be submitted online: www.cattell.duke.edu/cattappl.html.



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Support for Defusing the Arms Race

“The Publication Arms Race”, APS President **Lisa Feldman Barrett**'s column in the September issue of the *Observer*, drew considerable attention on social media. Here are some of the tweets that the column generated.



David DeSteno
@daviddesteno

My colleague & friend [@LFeldmanBarrett](#) makes excellent points here. As a scientist who uses confederate-heavy designs to study behavior in context, work is slow (running 1 participant at a time). We value these designs, but it means fewer papers.



Heather Urry
@HeatherUrry

Well said, [@LFeldmanBarrett](#). We need to defuse the publication arms race.



Keith Renshaw
@KeithDRenshaw

Terrific piece by [@LFeldmanBarrett](#) on growing push to publish insane number of articles. [#AcademicTwitter](#)

Bonus quote for life in general: "Sometimes we're responsible for fixing things not because we're to blame but because we're the only ones who can."



Maryanne Garry
@drlambchop

Brava, [@LFeldmanBarrett](#) and [@PsychScience](#) !



Roger Giner-Sorolla
@RogertheGS

This needs to be said and I'm glad Lisa said it. Even as we value multistudy papers more than single, we should also value large or nonstandard samples, more difficult methodologies, and careful and open reporting.

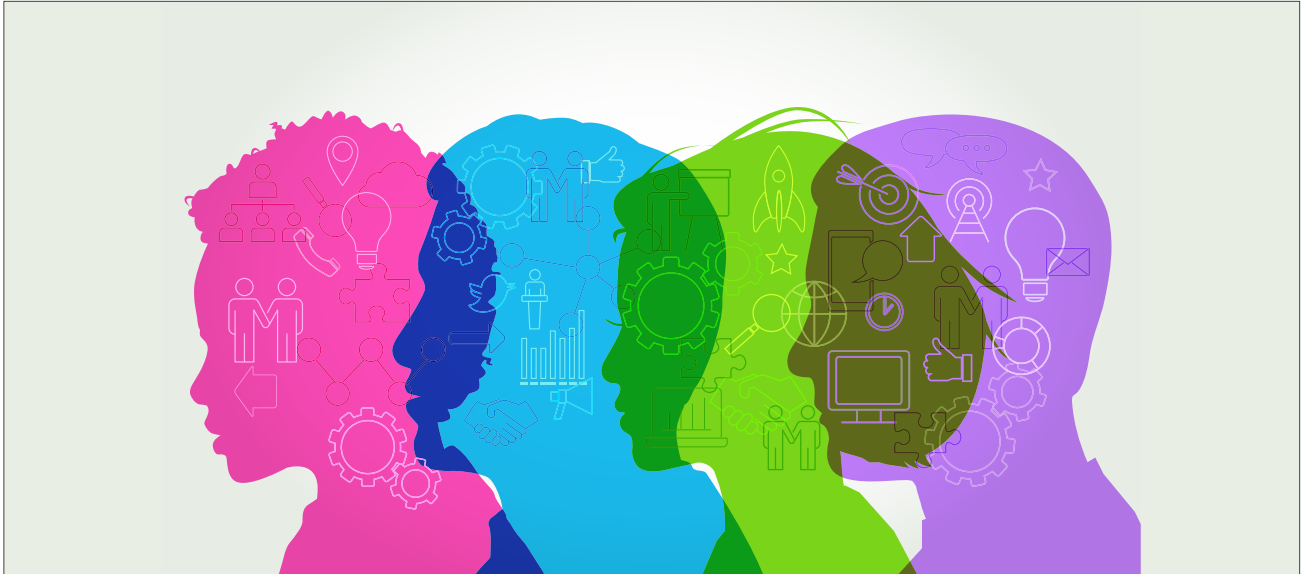


Sabine Doebel
@sabine_doebel

Fantastic, timely, and important column by [@LFeldmanBarrett](#)! So very inspiring to this junior scientist. Thank you. :)



Coming Soon: Psychological Science and Entrepreneurship Poster Award at APS 2020



Thanks to a sponsorship from the Ewing Marion Kauffman Foundation, APS is pleased to announce a new annual award to recognize and encourage research by students and emerging scholars studying psychological science and entrepreneurship.

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, broadly conceived. The purpose of the award is to stimulate research in this area, encouraging work examining such topics as social and personality characteristics of entrepreneurs, cognitive underpinnings of financial decision-making, perceptions of risk and risk-taking, effects of diversity and entrepreneurship, entrepreneurship within the larger context of industry and organizations, and more.

The Kauffman Foundation is a private, nonpartisan foundation that works together with communities in education and entrepreneurship to create uncommon solutions and empower people to shape their futures and be successful.

Two \$1,500 awards will be given, one to a student scientist and one to an early-career scientist. Awardees will also receive complimentary registration to APS 2020 and special recognition at the Convention.

APS Members can apply for this award when submitting their poster presentation for the 32nd APS Annual Convention in Chicago held May 21–24, 2020. Applicants should follow the instructions under the “Psychological Science and Entrepreneurship Award” heading in the APS Call for Submissions.

For more information and to apply, please visit the APS Call for Submissions open in October 2019.

You may also inquire about the award by emailing aps@psychologicalscience.org.

Applicant Eligibility:

- Applicants must be either a current undergraduate or graduate student, OR an early-career scholar, defined as having received their PhD in 2013 or more recently
- Applicants must be the first author on the submitted poster
- Applicants must have no current existing financial relationship with the Ewing Marion Kauffman Foundation
- Awardees must be APS Members
- Awardees must present their poster at APS 2020 in Chicago

Criteria for Award:

1. Relevance to the study of psychological science and entrepreneurship
2. Scholarly contribution to existing knowledge, application, or practice ●

Psychological Scientists Recognized With NSF Early-Career Awards



Luke Chang

The National Science Foundation (NSF), one of the premier science-funding agencies in the United States, has recognized a group of psychological scientists with early-career awards.

These psychological scientists were named to the Faculty Early Career Development (CAREER) program, which provides support for scientists who are in the beginning stages of their faculty careers to further their research programs while continuing their work in teaching, learning, and dissemination of knowledge.

APS Fellow Luke J. Chang (Dartmouth College) and psychological scientists Mariam Aly (Columbia University), Daniel Conroy-Beam (University of California, Santa Barbara), Morteza Dehghani (University of Southern California), Moira Dillon (New York University), Teomara Rutherford (North Carolina State University), Jennifer Silvers (University of California, Los Angeles), and Miko Wilford (University of Massachusetts Lowell) are among the recipients of this year's award.

The recipients have proposed research that spans the entire spectrum of psychological science. Chang's award proposal, for example, focuses on the neural and computational basis of guilt in decision making.

"This grant will help us develop computational models of the psychological and neural processes that give rise to emotions such as guilt that occur in the context of social interactions," says Chang.

"In addition, this grant will partially help fund an intensive Methods in Neuroscience at Dartmouth (MIND) summer school for graduate students, postdocs, and junior faculty to learn cutting edge data analytic techniques in an interactive hackathon environment," he explains.

Among the other recipients, Dehghani plans to build computational methods to predict hate crimes, while Silvers will examine the effects of institutional orphanage care on brain inflammation and development.

Conroy-Beam plans to use the award to develop computer simulations to help understand how individuals choose romantic partners.

"Essentially, we will try to predict real peoples' mate choices using simulated mating markets," he explains. "In preliminary data, we have found that this approach produces pretty accurate predictions and can identify happy, committed relationships."

"We're going to continue validating the method and use it to develop even more predictive models. We'll also use this work as an opportunity to teach students how to develop computational models for psychological research," he notes.



This grant will help us develop computational models of the psychological and neural processes that give rise to emotions such as guilt that occur in the context of social interactions.



— Luke Chang



Learn more about the NSF Faculty Early Career Development (CAREER) Program at https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503214

The CAREER award offers generous support of a minimum of \$400,000 for its 5-year duration. Applicants must outline a program of research that will build a foundation for a lifetime of research and education contributions, and must show that their application is supported by their academic department. CAREER winners are eligible to be nominated by NSF for the Presidential Career Award for Scientists and Engineers, which is the highest honor bestowed by the US government to early-career scientists. ●

2020 APS William James Fellows

APS Past Board Member **Susan A. Gelman** (University of Michigan), APS James McKeen Cattell Fellow **Carol S. Dweck** (Stanford University), **Neil Burgess** (University College London), and APS William James Fellow **Andrew N. Meltzoff** (University of Washington) are recipients of the 2020 APS William James Fellow Award in recognition of their lifetime of intellectual contributions to the basic science of psychology. They will receive their awards at the 32nd Annual APS Convention, to be held May 21–24 in Chicago.



Susan A. Gelman
University of Michigan

Susan Gelman is a professor of psychology and linguistics who has achieved international renown for her work on essentialism, the theory that people categorize objects and ideas on the basis of underlying features that are not obvious on the surface. Her research has shown that children have an early, powerful tendency to assume and search for such features. These findings argue against the standard view of children as concrete thinkers and overturn longstanding assumptions about what is simple or basic in human concepts. Gelman's theories on essentialist thinking have spurred a revolution in developmental psychology. Gelman served on the APS Board from 2011 to 2014. She was elected to the National Academy of Sciences in 2012.



Carol S. Dweck
Stanford University

Carol Dweck is a professor of psychology focused on understanding the implicit theories that can shape human development and growth. Her research has demonstrated the power of a *growth mindset*—the belief that abilities can be developed—to enhance learning and help struggling students improve their academic success. Her theoretical work has shed important new light on the workings of motivation and personality, with implications for the enhancement of human potential. Dweck has also received APS' James McKeen Cattell Award for her contributions to applied psychological research, as well as the APS Mentor Award, and has been elected to the American Academy of Arts and Sciences and the National Academy of Sciences.



Neil Burgess
University College London

Neil Burgess, a professor of cognitive and computational neuroscience, has made strikingly original contributions to our understanding of spatial and episodic memory. His behavioral, neuroimaging and electrophysiology experiments with both humans and rodents have bridged the gap between brain science and observed behavior, shining a light on the neural representations and computations supporting spatial cognition in humans. Burgess pioneered the use of virtual reality in studies of spatial memory and leverages his background in math and physics to generate novel predictions that continue to drive the field forward.



Andrew N. Meltzoff

University of Washington

Andrew Meltzoff is a professor of psychology whose theory of imitative learning has influenced researchers across disciplines, including evolutionary biology, robotics, and philosophy of mind. Meltzoff's research demonstrates that infant imitation serves as a powerful social-learning mechanism through which young children acquire the behaviors, skills, and norms of their culture. His "like-me" developmental framework connects early social understanding to the emergence of in-group bias and stereotyping in childhood. Recently, Meltzoff has begun to use neuroscientific methods to study imitation and perception-action coupling in infants. Meltzoff was elected to the American Academy of Arts and Sciences in 2009 and is a fellow of the American Association for the Advancement of Science. ●



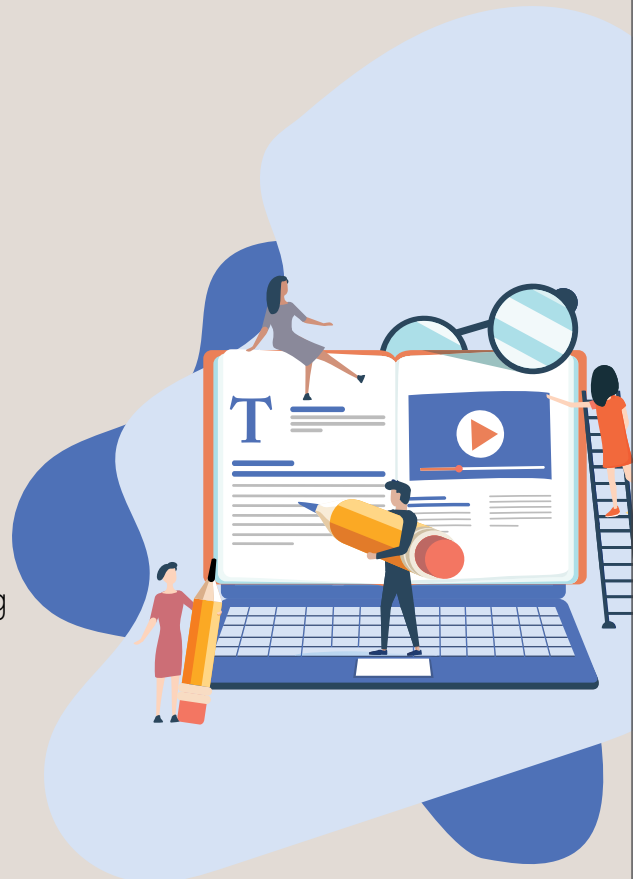
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Advice for New Faculty

It's your first faculty job. Now what do you do? A panel of three psychological scientists who have been there, done that offer some advice.

Kim Penberthy, University of Virginia School of Medicine

Jessica Schleider, Stony Brook University

Evan Kleiman, Rutgers University

Interviewed by **Rosanna Breaux**, Virginia Polytechnic Institute and State University

What are the first things you should do as a brand new faculty member?

Kim Penberthy: Get a mentor if you have not already been assigned one. This should be a faculty member at a higher rank who has risen in your system. Check and see if there is a mentoring program in your institution and join it!

Jessica Schleider: I'm not sure if these are things everyone *should* do, but here are some things I *did* do and found helpful:

Find out who the “go-to” administrative folks are in and beyond your department. Who is the best person to ask about reimbursement procedures? Who knows about navigating the IRB? The logistics of preparing and submitting grants? HR and on-boarding? I found myself with a long, regenerating list of questions in my first year; learning where to direct those questions saved me time and frustration.

Set up your physical lab space ASAP. If your work involves inviting participants for lab visits, this is a critical first step to getting your research program up and running.

Reach out to other faculty to set up coffee/tea meetings, and not just in your department! I found that folks were very willing to meet with a brand-new assistant professor, and building those

Rosanna Breaux is an Assistant Professor at Virginia Polytechnic Institute and State University. Her research focuses on the emotional and social functioning of children and adolescents with ADHD, with a focus on emotion regulation.

Kim Penberthy is a Professor of Research in Psychiatric Medicine at the University of Virginia School of Medicine. Her research focuses on exploring the impact of contemplative practices, including mindfulness and meditation. She explores not only the healing abilities of these practices, but also has explored the positive impact of contemplative practices upon human performance and extraordinary abilities.

Jessica Schleider is an Assistant Professor at Stony Brook University. Her research focuses on developing scalable, accessible interventions for youth mental health problems, particularly depression and anxiety; identifying the mechanisms of change underlying their effects; and testing novel approaches to dissemination.

Evan Kleiman is an Assistant Professor at Rutgers University. His research focuses specifically on understanding the everyday lives of individuals at risk for suicide using smartphone and wearable monitoring technology.

relationships opened doors for new collaborations (and even a funded grant) that I never would have thought of otherwise.

Create a plan/timeline for your grant applications for the coming year.

Collect examples of syllabi from other faculty in your department to inform the syllabi you need to create.

Find out from your chair/colleagues as much as you can about tenure-related expectations/goalposts related to grants, publications, teaching and service—along with what paperwork you'll need to complete, and when (e.g., for second- or third-year reviews).

Be kind and patient with yourself. Your pace may be slower than what you would prefer in your first year. Given the many new systems, responsibilities, and logistics you need to navigate (not the least of which is building a life in a brand-new place), that makes perfect sense!

Evan Kleiman: Take some time to think through your lab culture, your lab structure (will it be large? small? will you have postdocs?), and your lab infrastructure (what will you use the space for?). It's worth thinking things through before you jump right in. It's going to seem like you have to do everything at once, but this isn't true—it's worth it to take some time and learn the university's system, whom to ask for help, and to think through how you want your first weeks/months/years as a faculty member to go.

What do you see as the best way(s) to build a program of research when just starting out with your own lab (prioritizing low-hanging fruit vs. more ambitious projects, what to do about longstanding and fruitful collaborations when your being told to “demonstrate independence,” etc.)?

Kim: You must continue to publish and this is often the most important priority. Making sure that you do continue to publish on standard things you are researching with yourself as first author is important and you must also continue to develop and maintain collaborative relationships with others in order to build the connections for more advanced research projects.

Jessica: I spent much of my first year wrapping up pre existing projects, and applying for grants and building collaborations to support the larger-scale studies I am excited to pursue in the





In some ways, your lab is like a small business — this is very different from any other position we're in up until this point. We're responsible for money, people, etc. ”

— Evan Kleiman
Rutgers University

future. I was also in the fortunate position of having external funding for a clinical trial, which I was able to launch in my second semester. In terms of “demonstrating independence” — departments may have different attitudes and expectations in this domain, so I would suggest speaking with your chair for personalized suggestions. I know many newly-tenured faculty members who have continued to collaborate with their graduate advisors. To me, this makes perfect sense, because their shared interests led them to work together in the first place! As long as you have *some* areas of work that clearly depart from your advisor’s work, I tend to think you’ll be in good shape.

Evan: I like to have a mix of collaborations/projects that range from low-hanging fruit (e.g., analyzing data I collected during my postdoc) to new projects in my group with students to higher-risk projects that are contingent on grant funding.

What advice do you have regarding setting up a research lab team? Specifically, would you take a graduate student in year one or limit it to undergraduates and/or project coordinators to help run studies the first year or two?

Kim: I would take a grad student as soon as possible if that option is available — you can always learn together! I think paid project coordinators who are not students is absolutely necessary as well — this helps maintain continuity and typically has worked better for me.

Jessica: My first PhD students will arrive at the start of my second year as an assistant professor. I chose not to admit a student to start during my first year. My reasons were as follows:

I had accepted my position after the PhD application deadline had passed, so no students had applied to work specifically with me that cycle.

I was on clinical internship when I accepted my current position. I wanted to have at least some distance from graduate school before accepting my first PhD students!

Not all of my lab’s research relies on PhD student availability. I recruited several undergraduate and post-bacc research assistants (RAs), and that met my needs for the year. Also, my department has a terminal master’s program (MA), and I was able to mentor two MA students during my first year (our MA students match into labs after they arrive on campus). They became research assistants in the lab and were wonderful additions to our team!

Evan: I deferred my offer for a semester, so it wasn’t really an option to take a student my first year. But, if I could have, I wouldn’t since a lot of my first year has been spent setting up the lab and I think this would have taken a lot of time away from what’s needed for mentorship.

Please share some tips or tricks for new lab set-up that you have found helpful and perhaps wouldn’t have predicted would be so impactful both to productivity but also for undergrad RA involvement and satisfaction?

Kim: Work study students are a great way to go for some basic work. They are inexpensive and very helpful!

Jessica: At least three things have made a difference for me:

Weekly lab meetings in which *all* lab members, including undergraduate RAs, are active participants. This will become difficult as my lab grows, but my first year (there were nine of us; me, undergrad RAs, post-bacc RAs, and Master’s students) it was feasible for us all to meet as a group every week. Everyone contributes to those meetings. Lab members take turns giving 15-minute research presentations to the group - a sort of practice conference talk on a new paper in our field that’s of interest to everyone. I also ask all lab members to suggest discussion topics that the full group might benefit from (some recent ones: getting into grad school; applying for grants; developing research ideas; writing an IRB proposal). I like to think this helps to foster a sense that all of us are collaborators in the ongoing work, and that everyone has something to contribute — both of which I firmly believe.

I give undergraduates a fairly high degree of responsibility (e.g., recruiting, screening, and running participants through aspects of the study protocol as part of an ongoing clinical trial; coding for a meta-analysis). This is a big time investment on my end, because I train and supervise them. But it’s important to me, because receiving those types of opportunities in college allowed me to go to graduate school in the first place. With the

right scaffolding, and lots of step-by-step protocols, I find that many undergrads rise to the challenge of high-level tasks.

I use Basecamp to distribute/track lab tasks and streamline communication. It's an amazing platform — and you can get a free account as an educator!

Evan: Write up a lab manual and have procedures for as many tasks as possible (e.g., I use Asana and have “templates” for all kinds of repetitive tasks such as new RA onboarding). Make sure you clearly assign who's responsible for the task.

Order your furniture ASAP — I cannot stress this enough. I've heard a ton of stories about it taking months for furniture to come. I started 4 months early and still had to wait 8 months total!

In some ways, your lab is like a small business — this is very different from any other position we're in up until this point. We're responsible for money, people, etc. I make it a point to know how much money we have in the budget and what our plans are for that money—it's very easy to overspend if you don't watch your funding.

Don't forget what it was like being a student — things like conference travel can be insanely expensive, and if you're in a position to do so, you can help students with this. Make sure to have clear guidelines whenever possible for example. I make it clear that I'll pay for travel to at least one conference per year for any grad student, postdoc, or full-time RA in my lab. Make sure you can fit this in your lab budget before committing to do so!

Try something like Slack — if you don't know what it is, it's like AIM for the workplace. If you don't know what AIM is: (a) I feel old, and (b) it's like Gchat for the workplace.

Did you encounter any faux pas to avoid or unwritten rules to follow that are important to know?

Kim: Each institution is bound to have these, and unfortunately sometimes you can only learn them from a mentor or when you violate them!

Jessica: I imagine this is setting dependent, so that's an excellent question for your future department colleagues! (Beyond unwritten rules that exist across academic culture more broadly, I can't think of any in particular.)

Evan: Generally speaking, no — but I think it's important to get a sense of what the culture is like in your department (expectations for time in your office, students, and so on).

Did you feel it was expected for you to always be in your office as a new faculty member?

Kim: I think being present and visible is important; this may or may not involve “being in your office.”

Jessica: This varies by department culture, but in my case, no. Although to be accessible to my students and research assistants, I tend to work from my office anyway. I have a lot of autonomy in structuring my time — and am extremely grateful for that!

Evan: This varies a lot from department to department, but it's clear that there wasn't an expectation for me. I think the culture will be obvious early on, and you don't always have to follow it (e.g., if no one's in, you can still come in more often). Even if people are often in their offices, don't feel pressured to always have your door open. I'll usually let people know I'm there if they need me (post-it on the door, Slack status message).

How do you build and maintain mutually beneficial collaborators at a new institution? (finding someone who is related to your work but can offer something different, finding someone who is willing to pull their weight in the work, establishing division of duties in new research endeavors, etc.) Is it better to build collaborative relationships with people in similar points of their career or with people who are more established?

Kim: I think it is important to develop relationships with people at all stages of their career because each will have different things they can offer you. Additionally, finding out what mechanisms your institution has for connecting with others and then making sure that you become involved in those is important. For instance, our institution has a committee on women, programs for new faculty, for faculty leaders, etc., and these are very helpful.

Jessica: Other responses have covered the first portion of your question. As for collaborating with early-career versus more established investigators: Both have pros and cons, and generalizations aren't always helpful when it comes to choosing specific relationships to invest in. Personally, some of the work I'm proudest of has come from collaborations with folks who are energizing to work with, reliable, and kind. These people exist at all seniority levels!

Evan: I'd look around to other departments that complement what you want to do (e.g., stats, computer science) and get to know the person (directly or by talking to others) before committing to a project where you may not be happy with the collaboration. Related to this, you don't have to immediately collaborate with people at your institution — in fact, it's probably good to collaborate with people you know at other schools while you start up at your own, so you can get to know people. I've begun collaborations I'm very excited about here with a few people in my department, but at the same time, I've started new collaborations with collaborators I've been working with for a long time.

Re: points in collaborators' careers — I mostly have long term collaborations with people at the same or similar stage. But I do have some ongoing collaborations with my former mentors. My former postdoctoral mentor is my most frequent collaborator, however, my three other most frequent collaborators are all around the same stage as I am (one soon-to-be assistant professor, one established assistant professor, and one soon-to-be associate professor).



What is the best way to network and build research collaborations with your new colleagues?

Kim: See above regarding finding out about existing structures, groups, etc. and joining! Also joining committees such as the CE or promotion and tenure or other committees can be very helpful.

Jessica: “Cold-emailing” people to express admiration for their work and an interest in meeting about a possible collaboration has never (to my knowledge!) hurt me, and has occasionally helped! If there is any mutual interest area, I find it’s easy (and fun) to build projects from meetings that result from these initial contacts.

Evan: Get to know them outside of faculty meetings e.g., ask them to grab lunch, etc. But, it’s important to know that it’s not always realistic to expect to collaborate with your colleagues the way that you did your former lab mates (it may also not even

be encouraged). In psychology departments where the goal is breadth not depth, you may not have natural areas of overlap and this is OK (since you were hired to add to what the existing faculty do). But this doesn’t mean you shouldn’t be friendly with your colleagues and collaborate with them to help support the program. These people could potentially be your coworkers for life. So, most importantly, be a good citizen of your department.

Beyond being a good citizen of your department, be a good citizen of the field. Clinical psychology is a very small field and some people will be in your life for a long time (there are several members of SSCP who have known me since I was a teenager!). If you’re a good person, people come to know this. If you’re a jerk, they’ll know this too. ●

Adapted from a Q&A session of the Society for a Science of Clinical Psychology (SSCP). Like this content? Consider becoming an SSCP Member Today (sccpweb.org).

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Cattell Fund Projects Explore Music, Mental Imagery, and Visual Meaning

The 2019-2020 James McKeen Cattell Fund Fellowships have been awarded to APS Fellow **Brad Wyble**, **Andrea Halpern**, and **Clayton Curtis**. Presented in partnership with APS, the fellowships allow recipients to extend their sabbatical periods from one semester to a full year. During that time, the researchers plan to pursue the research projects outlined below.



Brad Wyble

Pennsylvania State University

My lab explores how the human mind extracts meaningful events from a continuous stream of sensory information. For example, we have developed models of target selection that explain how the attentional blink (Raymond, Shapiro & Arnell 1992) could play a role in dividing a continuous stream of visual input into a series of discrete episodes that encapsulate different stimuli or events (Wyble et al., 2011).

Recent innovations in computer vision have provided biologically inspired models called convolutional neural networks (CNNs) that mimic some aspects of human visual function (Krizhevsky, Sutskever & Hinton 2012). These models are mostly focused on single images, whereas biological visual systems integrate information over time to provide a rich comprehension of events and interactions. The focus of my sabbatical will be to develop new models of visual processing that extend CNNs to better understand how the brain extracts meaningful information from video input.

This idea is inspired by the notion that attention is not just useful for in-the-moment perception, but also helps us to learn more efficiently by selecting which information about the world becomes part of our remembered experience. By providing a structured and sparse set of memories to guide learning, attention may increase the rate at which our perceptual systems learn to make sense of the data from our senses. Such theories can be tested with computational models that learn how to perceive such regularities (e.g., CNNs). By imbuing such models with biologically and cognitively inspired attentional systems, we can test how attention affects learning. My sabbatical will give me time to learn the application of such models to video data, and more importantly, how to incorporate analogs of human attention into such models. I am indebted to the James McKeen Cattell Fund for allowing me to spend an entire sabbatical year developing new directions in my research program.

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Andrea Halpern

Bucknell University

I've always been interested in understanding how the mind and brain perceive and remember nonverbal information, especially music. Most people respond to the structure and function of music, and relationships between musical training and developmental trajectories can be studied. A special interest of mine is understanding auditory imagery as mode of music retrieval.

My sabbatical year will be divided between the University of Maryland and the University of Durham (UK). With two collaborators in Maryland, I will combine machine-learning methods with EEG data to understand how neural activity associated with hearing environmental sounds may predict the environmental sound you are later imagining. Another project will follow up on prior work showing musical conductors are better than pianists in monitoring two musical streams. We'll be adding a language task to examine generalization to other auditory domains,



and also EEG to see whether neural responses to targets are stronger among the conductors. A third project will explore auditory mental imagery in healthy older adults.

In Durham, I will be working in the Music Department on two music emotion projects. One will extend my prior work showing that musicians display a larger EEG signal than nonmusicians when they hear the first minor interval in a melody (which conveys negative affect). Will nonmusicians show this response if the musical instrument is “happy” rather than “sad”? Which cue will “win” in conveying the emotion of a melody when they are in conflict?

Another project deals with aesthetic reaction to music. A prior study showed that when asked to rate music for pleasantness in real time, people’s ratings head unidirectionally toward the positive or negative end of the scale. We are asking whether decision time will vary in older versus younger adults. The former are typically slower, but they do have many decades of experience with knowing their own taste.



Clayton Curtis

New York University

For decades, scientists have argued about the importance and function of mental imagery (Pylyshyn, 2002; Kosslyn et al., 2006) and how the brain might support imagery. We now know that imagery evokes complex patterns of neural activity in the early visual cortex (Klein et al., 2000) that resemble the patterns of activity when one imagines or holds that image in working memory (Albers et al., 2013). This suggests that the neural mechanisms that allow us to see things outside our body also allow us to see imagined or recalled things in our mind. Moreover, there appear to be large individual differences in imagery ability, including so-called aphantasia, a loss of visual mental imagery (Zeman et al., 2010). Nonetheless, the causes of this variation remain unknown.

With the support of the Cattell Fund Award, I will use recent computational neuroimaging developments in my lab that allow us to map almost two dozen retinotopic areas in the occipital, parietal, and frontal cortex (Mackey et al., 2017) and also model the contents of both perceived and imagined images (Rahmati et al., 2018). The main idea is that variation in these topographic maps underlie the variation in mental imagery ability. Leveraging these developments with collaborations across New York University’s Global Campuses, we will test a variety of hypotheses about the cognitive and neural mechanisms that enhance and limit mental imagery. ●

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QUOTE OF NOTE

“Individuals who experienced even a single recession impact still had higher odds of nearly all of the adverse mental health outcomes we examined – including clinically significant symptoms of depression, generalized anxiety, panic, and problems with drug use – three years after the recession ... These findings may be particularly pertinent given some indications that the next period of economic contraction might begin as early as 2020.”

Miriam K. Forbes, Macquarie University in Australia, on a study on the long-term psychological ramifications of the Great Recession. The findings appear in *Clinical Psychological Science*.

Universal Design for Inclusive Science

By Nazanin M. Heydarian

As the semester gears up, Introduction to Psychology students are going to start looking for ways to accumulate research participation hours. Most of us were Intro Psych students at one point in time. Twelve years ago, I was the nerd who eagerly started research participation early. As a blind person, I quickly found that many studies were unwelcoming. In some cases, the description on the research-participant-pool platform excluded me as a disabled student. When I would show up for a study, I would awkwardly rearrange the computer monitor and keyboard while the research assistants hung out and watched.

In this piece, I highlight a few resources intended to enhance the accessibility of nondisability-related research for disabled participants in the hopes that researchers of all kinds will find something to take back to the lab and try out.

Rethinking Disability-Exclusion Criteria

In the biomedical sciences, disability as an exclusion criterion is rarely justifiable, and such exclusion contributes to health disparities faced by disabled people. Any resulting innovations may not work for disabled people because they were not developed with data from disabled participants (Kroll, 2011; Williams & Moore, 2011). If the central focus of the study is to examine processes such as sight, hearing, or movement, it may be justifiable to exclude participants on the basis of a specific disability. However, there would need to be strong justification for more research on those whose perspectives are overrepresented.

For those of us who use research materials that have sensory and motor features (e.g., visuals, sounds, reaction times measured with keystrokes) as a means of studying underlying cognitive or social processes, we may think of specifying our exclusion criteria to function-related cutoffs to avoid needlessly excluding disabled participants whose disability does not affect their ability to complete the task (Kroll, 2011; e.g., a blind person can participate in a phone survey). Such exclusion should also require justification because the disability is not directly related to the central constructs of interest.

Welcoming Diversity

Including information in a study description about how a study is accessible can draw potential participants who may

have otherwise assumed that the study was inaccessible (Williams & Moore, 2011). Furthermore, researchers can include a statement in the consent form inviting participants to request accommodations so that participants need not disclose a disability (Rios, Magasi, Novak, & Harniss, 2016). Disabled and nondisabled participants may feel more engaged if they can request conditions that are best suited to their needs and preferences — having participants who feel comfortable translates to higher quality data for you (Rios et al., 2016).

Access to Your Study

As researchers, we may consider the accessibility of the paradigms that are typically used in our disciplines and devise alternatives, where necessary, to accommodate those with diverse needs and preferences, while maintaining (or enhancing) scientific rigor. We can often come to solutions that use little to no extra time and money (Kroll, 2011). When designing your study, you could choose materials that are inherently accessible in multiple modalities; you could also be prepared to provide modifications of study tasks, depending on how you ask your research questions and design your methodology (Rios et al., 2016). For example, if you are interested in participants' responses to text, you may prepare a version of your study that is accessible with a screen reader, which can read at a standardized speed just as text can appear on a screen for a standardized amount of time. You can collect data on how the task was administered and see for yourself whether your accommodation covaries with variables of interest.

The following resources can help you evaluate the accessibility of your study materials:

This is a simple checklist based on the Americans with Disabilities Act that can be used to assess for basic accessibility of a physical testing site: adachecklist.org/checklist.html.

This section 508 compliance checklist can be used to evaluate the accessibility of your electronic materials: hhs.gov/web/section-508/making-files-accessible/checklist/html/index.html.

You may be surprised to find that some of your study materials are more accessible than you thought. That would be a great thing to note in your recruitment materials and in publications. You can also consult with experts in accessibility (e.g., people with disabilities, rehabilitation counselors, people at your institution who specialize in accommodations, external accessibility, evaluators and consultants). If you don't know how to provide accommodations, advice from experts on ways to enhance the accessibility of your research will complement your own expertise in research design and lead to a rigorous and accessible science.

Nazanin M. Heydarian is a health psychologist and a postdoctoral Fellow at the Steve Hicks School of Social Work at the University of Texas at Austin. She uses mixed methods to study stereotypes and clinical decision-making with minority populations, including people with disabilities.



Including information in a study description about how a study is accessible can draw potential participants who may have otherwise assumed the study was inaccessible. ”

Everyone Benefits

Building accessibility into your research can cost little to no extra time and money — you may even discover increasingly efficient ways to administer materials. Nondisabled people have benefited from accessible solutions in the past (e.g., texting on cellphones was originally an accessible feature for deaf cellphone users), and you will foster a more approachable scientific practice for the next generation of scholars. ●

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Interoception

How We Understand Our Body's Inner Sensations



It's common to conceive of the brain as an organ designed to react to stimuli from the outside world. A heavy book falls off a table next to you, and your brain allows you to see, hear, and feel the impact. Watch a muted *video* of a book falling off a table, however, and your brain may still generate a version of these sensations — causing you to jump at the illusory slam of the book hitting the ground even though the signals we would normally process as sound or vibration are absent.

This is because our brains didn't evolve to react to the world around us, but rather to predict what's going to happen to us next, APS President Lisa Feldman Barrett of Northeastern University explains.

"Brains didn't evolve for rationality," said Barrett. "They did not evolve for you to think or to perceive the world accurately. They didn't even really evolve for you to see or hear or feel. Brains evolved to regulate a body so that it could move around the world efficiently."

By Kim Armstrong, APS staff writer

The core task of a brain working in service to the body is allostasis: regulating the body's internal systems by anticipating needs and preparing to satisfy them before they arise. Interoception — your brain's representation of sensations from your own body — is the sensory consequence of this activity, Barrett says, and is central to everything from thought, to emotion, to decision making, and our sense of self.

"Your body is part of your mind, not in some gauzy mystical way, but in a very real biological way," she said during an Integrative Science Symposium at the 2019 International Convention of Psychological Science (ICPS) in Paris. "This means there is a piece of your body in every concept that you make, even in states that we think of as cold cognition."

To maintain allostasis, Barrett continued, the brain must continually construct concepts that guide the body by integrating scraps of sensory input with memories of similar experiences from the past. Creating this internal model of your body in the world allows the brain to infer the causes of the sense data that it receives through the retina and other sensory organs.



“This predictive process is the way your brain navigates the world, guides your actions, and constructs your experiences,” she said.

Barrett’s work with functional MRI (fMRI) has also shed light on the role of the brain’s default mode network, which helps to initiate prediction signals, and the salience network, which helps to determine which unexpected sense data are important to learn in a given moment. Barrett’s research shows that both networks, working in concert, contribute to allostasis and its interoceptive consequences.

Ironically, Barrett notes, these regions’ limbic cortices, once derided as the brain’s reactively emotional “inner beast,” may be closely tied to the anticipatory processes that construct our perception of the world.

(Mis)Predictive Processes

Maintaining allostasis is a lot like managing a budget for the body, in which glucose, water, salt, and other biological compounds constitute the currency, Barrett says; as with any

budget, it’s possible to run a metabolic deficit. When this happens, the brain will reduce spending on two “expensive” things: moving the body and learning new information. This can result in fatigue, confusion, and anhedonia and, in the long run, depression.

Allostatic disruption is just one of many factors that contribute to depression, Barrett notes. Appreciating the physical basis of symptoms can be helpful for people suffering with the disorder, who often feel that they can’t control their negative thoughts and feelings.

“Sometimes you feel wretched for a purely physical reason,” she said. “It’s not thoughts that are driving feelings, but feelings that are driving thoughts.”

Differences in the predictive processes supported by interoception can also contribute to psychopathology, says Martin Paulus of the University of California, San Diego. Healthy individuals, he explains, have a set of expectations about the state of the world that they update by observing and evaluating new evidence relative to past experiences.

A cyclist, for example, may have a running model of where he can bike on the road that is based on how close cars generally come to the curb, which he would continuously update on the basis of the sounds of approaching cars and the distance at which he sees the vehicles pass him.

“It’s not that perception is a passive process,” Paulus said. “Perception is an active process based on what your prior experiences are.”

This process can go awry, however. A healthy individual might perceive an increase in heart rate when arriving at a party as an indicator of excitement, wrote Paulus and Murray Stein (University of California, San Diego) in *Brain Structure & Function*; someone with anxiety, however, may interpret that same interoceptive signal as predicting impending danger.

Paulus, Stein, and colleague Justin Feinstein (University of Tulsa) further investigated the basis of these interoceptive prediction schemas in *Biological Psychiatry* through an fMRI study of 26 participants, half of whom had high trait anxiety. The findings showed that participants in the two groups performed equally well in a series of tasks in which they had to choose between two options. Even when there was little chance of choosing incorrectly, however, highly anxious individuals demonstrated significantly more activity in the anterior cingulate, a region of the brain involved in differentiating between predictive and nonpredictive signals.

This suggests that individuals prone to anxiety may need to devote more processing resources to decision making in order to distinguish ordinary fluctuations in their physiological state from signals that predict potential harm, Paulus wrote.

Individuals experiencing this kind of interoceptive failure, including people with depression, he explained, will not shift to a more adaptive belief about the state of the world even in the face of evidence proving their current understanding is incorrect.

“You can often present this person with evidence that the anxiety is really irrational or has no basis, and yet there is a





We tend to think the brain is sitting on top of the pyramid, and it's controlling the body in general — actually, it's probably the other way around. ”

— Catherine Tallon-Baudry,
École Normale Supérieure

strong resistance to learning that new information,” he said.

Context rigidity, on the other hand, can lead individuals to inappropriately apply their past experiences to their understanding of an unrelated situation – for example, if a hiker who had a run-in with a bear on the trail began expecting bears around every corner on their daily commute.

Interoceptive signals can also lead us astray when our body's signals conflict with our best interest, interfering with our intuitive decision-making abilities. To investigate this effect, Barnaby D. Dunn (Medical Research Council Cognition and Brain Sciences Unit, United Kingdom) and colleagues monitored the heart rates of 92 participants as they completed the Iowa gambling task. This measure of intuitive thinking hinges on individuals identifying that two of the four decks of cards available to them contain mostly profitable cards, while the other two decks are more likely to subtract from their final score. After completing this task, participants counted their heartbeats over several time intervals, which the researchers compared with actual electrocardiographic (EKG) measures of participants' heart rates.

Overall, the researchers wrote in *Psychological Science*, participants with more accurate interoception were more likely to make decisions that aligned with their cardiac activity — that is, to choose a deck in response to an increase in heart rate. If their heart rates increased in anticipation of choosing the wrong decks, however, this could lead individuals to score worse than those who had less awareness of their body's activity.

Paulus's ongoing Tulsa 1000 longitudinal study is focused on identifying how these kinds of predictive failure modes contribute to various psychopathologies involving substance use and eating behavior. One aspect of the study puts cardiac interoception on center stage, tasking participants with counting their heartbeats to assess their awareness of their own bodies.

“What I would like to do is see whether we can build, in a literal sense, the EKG of the psychiatrist,” Paulus said.

In addition to supporting more precise diagnoses, this could enable practitioners to communicate how failures in the predictive processes that draw on interoception may contribute to psychopathology on an individual basis, he concluded.

Listen to Your Heart

In the absence of input from the outside world, the brain might generate its own spontaneous activity, but it's also possible that such activity reflects the brain processing visceral input from our internal organs, said Catherine Tallon-Baudry, who studies cognitive neuroscience at École Normale Supérieure in France. The heart and the gastrointestinal tract both generate their own electrical activity (this is what allows a donor heart kept in cold-storage to continue beating on its own) and, during fetal development, these organs begin contracting before the brain becomes fully active. This suggests that the brain develops in response to these organs.

“We tend to think that the brain is sitting on top of the pyramid, and it's controlling the body in general — actually, it's probably the other way around,” Tallon-Baudry said.

One indication of this is the way in which information is relayed to and from the brain through the body's sensory pathways: 80% of fibers in the vagus nerve ascend from organs such as the stomach and the heart to the brain, while just 20% descend in the reverse direction.

This sensory interplay may be about more than just allostatic regulation, however — Tallon-Baudry's research suggests that it may also support first-person perspective taking, a foundational building block for our sense of self.

To be conscious, you need to have a subject of consciousness, she explains, and interoception of signals from our organs may help our brains unite incoming information — including sight, body placement, and cognitive categories — into a singular point of view.

Discussions of consciousness can easily veer into philosophical territory, Tallon-Baudry said, but her work focuses mainly on the mechanical aspects of this phenomenon.

“We know there is a lot of unconscious information processing in the brain, so having first-person perspective is not necessarily a default mode. We need a mechanism to account for it,” she said.

In a *Journal of Neuroscience* study probing the link between the heart and first-person perspective, Tallon-Baudry and colleagues Mariana Babo-Rebello and Craig G. Richter (École Normale Supérieure) monitored 16 individuals' heart and brain activity using magnetoencephalography (MEG) as their minds wandered. The participants were periodically interrupted by a visual stimulus, at which point they reported the content of their thoughts. During thoughts that participants later reported being about themselves, individuals demonstrated a greater neural response to their own heartbeat in the default mode network than during thoughts about someone or something else.

"How the brain responds to heartbeats distinguishes between self and other," Tallon-Baudry said.

One application of this and other findings related to visceral inputs, she noted, is to aid in the difficult task of assessing patients in unresponsive states, such as those emerging from comas. Monitoring the brain's response to heart rate can reveal transient signs of consciousness in these patients, Tallon-Baudry explained, which can have serious consequences for end-of-life decisions.

Feeling Is Seeing Is Believing

Interoception of input from our hearts can also influence our visual perceptions, said APS Fellow Manos Tsakiris (Royal Holloway University of London, United Kingdom) — whether what we're seeing is there or not.

Faulty predictive coding can contribute to a range of phenomena, he notes. In the United States, for example, Black individuals are more than twice as likely as Whites to be unarmed when killed during encounters with police, who sometimes report misidentifying objects such as phones as guns and other weapons.

This racial bias has also been demonstrated in the lab, where White participants engaged in weapons identification and first-person shooter tasks are more likely to report seeing a gun or to fire their digital weapon in response to images of Black individuals.

In a similar *Nature Communications* study of 30 White participants, Tsakiris and colleagues monitored individuals' cardiac cycles using EKG during a weapon-identification task. The researchers found that individuals were more likely to identify a non-threatening object as a gun when it followed an image of a Black individual presented during cardiac systole, when blood is ejected from the heart, than during cardiac diastole, or between heartbeats.

This suggests that ongoing heart activity — and cardiac systole in particular, which is thought to enhance perception of fear-inducing stimuli — can influence the expression of bias, Tsakiris and colleagues Ruben T. Azevedo (University of Kent, United Kingdom), Sarah N. Garfinkel (University of Sussex, UK), and Hugo D. Critchley (Brighton and Sussex Medical School) wrote.

"Rather than saying seeing is believing, we should think more about believing is seeing," Tsakiris said. "The kinds of prior beliefs and experiences that you have dominate perception."

Our body's response to images can also shape the way we see our sociopolitical world, which, at times, can make it difficult to separate fact from fiction, he says. In his ongoing research, he has found that heart acceleration in response to photojournalistic images of human suffering is correlated with judging that image to be real, rather than staged or edited. Individuals who have difficulty labeling their own emotions, on the other hand, are more likely to dismiss such images as faked.

One factor that doesn't appear to play a role in these studies, Tsakiris notes, is political orientation: Both conservatives and liberals were found to use arousal as an index of realness, though the link between arousal and perceived realness was stronger in older participants.

"Images from paintings to icons to photojournalism and beyond have always been very powerful cultural agents that shape culture and the ways we experience social and political events, especially when these are happening remotely," Tsakiris said.

These images are often thought of as "truthful witnesses of reality," he continued, but at the same time, they reflect our beliefs. It's this illusion of authenticity, supported by the interoceptive properties that construct our realities, that can make these and other perceptions so powerful. ●

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Hacking the APS Convention

By Kelci Harris, Eiko Fried, Lorne Campbell, Emorie Beck, Jessica Flake, Melissa Kline

It was an unusual sight for a Sunday morning session at the 2019 APS Annual Convention: The stage was empty, and all of the action was on the floor. Attendees had gathered in four groups, sitting around tables with laptops. Each group proceeded to spend the session talking, typing, and accumulating resources with the goal of facilitating best research practices. This was the scene of the first-ever APS hackathon — hopefully the first of many to come.

Hackathons started in the tech industry and have been adopted by the open-science movement, as well — they're a key feature of the programming at the annual conference of the Society for the Improvement of Psychological Science (SIPS). Hackathons are “sprint-like events in which interested researchers from all career stages collaborate intensively on projects” (en.wikipedia.org/wiki/Hackathon). The main goal of these sessions is working together toward actionable outcomes that can be shared openly. There is an emphasis on horizontal, rather than hierarchical, knowledge transfer, and also on removing barriers to interactions. Hackathons are a fantastic addition to traditional conference sessions because they provide opportunities for direct collaboration and creativity.

Here we describe how we structured the event, the challenges we faced, what we accomplished, and what we learned to make the next one even better.

The APS Annual Convention is a large conference spanning several areas of psychological science. It is attended by undergraduates, full professors, and everyone in between. In addition to the different levels and types of expertise APS attendees bring to the table, they also have a range of experience with hackathons. The goal, therefore, was to provide an egalitarian and inclusive collaborative working space for attendees of all backgrounds, a space where younger attendees would not be intimidated by more senior researchers and those inexperienced with hackathons would feel empowered to make their voices heard.

Our first steps toward inclusion started months before the conference. During several virtual meetings, we carefully considered what topics and projects to work on. We decided to focus on topics that were more effort-based than expertise-based. In other words, the projects would primarily require effort and be accessible to anyone regardless of their knowledge and expertise. At the beginning of the session, we provided background information about how hackathons work and outlined the goals

of the session. Finally, we promoted a code of conduct that reinforced norms of inclusivity, and we encouraged attendees of all backgrounds to participate and treat each other with respect.

Additional challenges arose as we were deciding how to structure the session: How could we work efficiently within the time constraints? How could we plan ahead without being authoritarian? Would we have 5 participants or 50? How would we handle the flow of people in and out of the session?

Hackathons usually include time to brainstorm and formulate a project idea to work on. We didn't have the time for that. To address the time constraints, we built scaffolding into the session. The co-chairs prepared one or two topics that they could facilitate. Our roles during the session were to provide direction and keep our groups working toward creating some output in the given time. Because we didn't want to dictate to the attendees what they would be working on, we planned to conduct an interest poll to democratically decide which of the prepared topics to work on during the session. The interest poll also addressed our concern about attendance. The number of attendees and their interests determined how many groups we would form.

We knew that there would be some latecomers and some people who would leave the hackathon early. There were other symposia and poster sessions scheduled at the same time as the hackathon, and it was also the last day of the conference. We built in breaks every hour for progress updates, grabbing coffee, and giving people a chance to filter into and out of the session. Whenever new people arrived, a co-chair who was not facilitating a group oriented them to the session.

On the day of the hackathon, the co-chairs introduced their topics, the attendees voted on the topics they were most interested in, and we formed four groups. In true hackathon form, the topics evolved and adapted to the interests of the participants; some groups split up, others merged. By the end of the hackathon, each of the four groups had generated a product. These products are published on OSF at osf.io/c8xbp.

Given the time constraints, some work is bound to be unfinished. One of the groups set a solid foundation for their project and then developed an action plan to complete it after the conference. They handled the remaining work by selecting a point person to keep the project on track and being open about how much time they were willing and able to commit to finishing it.

Three of the products are ready to use, and address different stages of the research process:

1. Are you using preregistration and OSF to manage your projects? Consider using project lifecycle tags, which track the current status of a project: osf.io/ej8k4/.

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Lorne Campbell, *University of Western Ontario, Canada*
Emorie Beck, *Washington University in St. Louis*
Jessica Flake, *McGill University, Canada*
Melissa Kline, *Massachusetts Institute of Technology*

2. Did you preregister a project, and the project didn't quite go as planned? This document might help you navigate the process of providing a transparent report of deviations from the preregistration when you are ready to publish your work: osf.io/wvp46.

3. Are you reviewing a paper and want to apply an open science perspective? Here are some resources and a checklist: osf.io/c56jx.

A bonus product from the hackathon is the feedback we collected from the session. We created a feedback survey and received lots of helpful and constructive comments from attendees. Generally, the hackathon was positively received — one person called it the “highlight of [their] conference” — but there is a lot of room for growth and improvement.

A few tips for future organizers: Implementing a loose registration would give organizers some idea of attendance numbers ahead of time, without closing the event to people who didn't register in advance. Preparticipation, such as doing an online interest poll, could help garner excitement about the topics, and keep attendees informed and engaged leading up to the event. Finally, make sure coffee, tea, and plenty of electrical outlets are in the room to keep attendees and their computers fueled and ready to work.

After the hackathon, a group of us left the convention center to get lunch together. Conversation was lively, despite most of

the group having just met for the first time a few hours prior. Hackathons build connections. That's what is so unique about them, and why they are excellent complements to traditional sessions. Networking at conferences is often a function of who you already know and can reflect and reinforce the hierarchical nature of academia. Hackathons create opportunities for organic networking by turning strangers into coworkers. People who may not have otherwise met are able to engage with each other over shared interests, and when they return home from the conference, they are more connected than they were before.

This first hackathon was a proof of concept, of sorts. We weren't the only ones to try integrating hackathons with traditional conferences this summer; in June, the Association for Research in Personality incorporated three hackathon sessions with their regular programming. Hackathons are full of potential, and their applications are really only limited by the creativity of the people organizing them and participating. Scholars from all over the world come together to meet in convention centers each year, bringing with them their expertise and enthusiasm. Why not also come together and make something?

Given the feedback, the productivity of the session, and the connections formed, we felt that APS's first hackathon was a success. We hope these collaborative events continue to gain traction at APS and beyond. ●

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It's in the Genes: Increasing Knowledge of Psychological Concepts with Family History Research

By Nickles I. Chittester

I was in elementary school in the 1980s when I first asked my parents where they came from; when I was told their states of birth (Pennsylvania and Iowa), I asked: “But where before that?” I then learned that I have English and Irish heritage on my father’s side, and that Mom was “full German.” I didn’t think much more about my heritage until I entered college in 1995; the movie *Braveheart* was released that year, and it depicted England as the evil oppressor of Scotland, their northern neighbor. The movie increased my interest in my English heritage, so I entered the world of family history and genealogy to explore my identity — and I have enjoyed investigating my heritage ever since.

Now, as a psychology professor, I see clearly the intra- and interpersonal effects of family history research (FHR) and encourage its use in psychology courses as a teaching technique to increase students’ awareness and critical understanding of psychological concepts. FHR may be integrated into different types of psychology courses, but it may be especially well-suited to introductory courses, which are in need of more teaching techniques that enhance learning (Gurung & Hackathorn, 2018) because of the diversity of topics the courses cover. Because family history is about the self and one’s family’s collective story across “space and time,” it’s the height of personal relevance and therefore provides a context in which principles of psychology can be better understood. Also, at the core of FHR is active learning, which is believed to promote higher levels of thinking about psychological principles (Richmond & Hagan, 2011). FHR also represents an opportunity for interdisciplinary exploration when the student discovers the stories of his or her ancestors in the broader historical, cultural, and sociopolitical context of their time (Ritchey & Bott, 2010). In this article, I share my perspective on how FHR can benefit students of psychology.

For FHR to have the most benefit, it should go beyond an establishment of lineage and manifest instead as a critical look at one’s family history, including an active exploration of sociopolitical and cultural influences on one’s ancestors. This approach, termed *critical family history* (Lee, Kumashiro, & Sleeter, 2015; Sleeter, 2008), offers promise both in helping students understand psychological concepts via exploring the experiences and decisions of people at different points in history and in helping them see how life today features the same triumphs and hardships as in past generations. And the best part of this exploration is that the student possesses the same DNA as the subjects of their research.

There are myriad psychological concepts that could be better

understood by engaging in FHR; below I offer a few that may serve as good starting points along with pedagogical suggestions.

Identity Formation: Ethnicity and Social Standing

Ethnicity

The literature on identity, ethnicity, race, and genealogy is vast (e.g., Scodari, 2016; Tutton, 2004) and largely beyond the scope of the present article; however, Americans — especially those of African (Rotimi, 2003) and European (Sleeter, 2008) descent — largely lose a sense of ethnic identity related to ancestral origins across generations. FHR would be an excellent context for discovering, exploring, and attempting to understand ethnicity and one’s own ethnic background in particular. To achieve this, students may be asked to write a one-page reflection on their specific ancestral origins after having gathered information from parents and grandparents, thinking about what it means to be not simply “White,” for example, but specifically of German or Irish heritage.

Social Standing

Social standing can vary considerably both within an individual’s lifetime and within a family from one generation to another. Students can increase awareness of how it can change over the course of one’s lifetime by conducting a brief review (1 or 2 pages) of or presentation (5 or 10 minutes) on an ancestor’s life and how it helps them understand their own life path (and anticipated future). As part of this effort, the student would provide evidence of both personal (e.g., skill/ability/education level, health, age) and social (e.g., family dynamics, job availability, education access) factors pertaining to his or her ancestor.

Belongingness

Families continue, and you are the present “link in the chain.” I represent a link in my family’s genealogical chain, and my children will likely lengthen the chain with children of their own. Since I am an FHR buff, I already share family stories with my kids — and they often want to learn even more. Beyond entertainment, though, sharing stories about previous generations of the family and being conscientious of how present attitudes, behaviors, and styles of social interactions affect the family is important because these aspects of a family environment tend to be passed down through generations: Children often internalize them and create a similar environment for their own children



via a phenomenon termed *transgenerational family memory* (Ferring, 2017). Thus, the way I interact with my sons is likely to continue to affect them throughout their entire lives — as a psychological scientist, I recognize this is consistent with the behaviorist emphasis on the power of the environment in shaping behavior and consolidating preferences and habits. For students to better understand principles of conditioning, they could be given a “Shaping the Family — From One Generation to Another” assignment (a paper or brief presentation) in which they identify family-created environmental conditions that explain mannerisms, attitudes, or preferences of their own.

Personal Wellness

Some traits and characteristics people may want to uncover about ancestors relate to temperament (e.g., a sweet great-grandmother), styles of communication (e.g., the talkative grandfather), and behavioral tendencies (e.g., alcoholism, gambling, church-going) because these things “run in the family.” Gathering information pertaining to recent ancestors could provide useful context for understanding one’s present experiences (e.g., “I take after my grandfather because I’m quiet like he was”). In addition, FHR can shed light on physical characteristics (e.g., eye color, stature) and health (e.g., diabetes, heart disease) and, in the latter case, may produce very important information regarding both present health conditions and elevated risk for, or increased susceptibility to, illness and disease (Lord, 2018). This information may then motivate regular health check-ups and preventative screenings (Harmon et al., 2005).

Critical Thinking

In my own FHR, I’ve come across curiosity-invoking facts that were either unexpected or represented a way to understand changes in sociocultural dynamics over the years. To illustrate this, I offer an example from my family tree. A maternal great-great uncle of mine suffered from epileptic seizures and died at the age of 33. I heard a story via relatives that his father (my great-great grandfather), annoyed with plaster falling from the ceiling when his son was seizing on the floor upstairs, installed tin sheeting on the ceiling to prevent further plaster loss. When I first heard this I felt it was an insensitive move on my great-great grandfather’s part, and I wonder how his son felt — was he embarrassed or ashamed of his condition and the “inconvenience” this caused the household, or did he shrug off his father’s reaction? I don’t know. But his story reminds me to have sensitivity to others: I may know about some people’s struggles because their source is readily observable (e.g., a physical or intellectual disability); however, I also realize that I don’t fully know what experiences people have had and, sometimes, are currently experiencing that are bringing them hardship. This encourages me to take a genuine interest in others, and, in the spirit of proceeding with the “unconditional positive regard” championed by Carl Rogers, to make honest and sincere attempts to understand people from their point of view. Accordingly, assigning students to search for an ancestor

with an unusual life circumstance could provide students an opportunity to build a sense of compassion for and acceptance of others who are different from them.

Conclusion

FHR is a rewarding pursuit that offers psychology instructors a potential teaching technique. Because numerous psychological concepts are inherent within FHR, instructors are encouraged to integrate FHR assignments into their courses with the goal of increasing knowledge of those concepts. In addition to the suggestions I’ve provided here, other concepts that could be considered include personality, stereotyping, prejudice, motivation, stress, conformity, and attraction. Whatever the psychological topic of interest, it’s important to proceed knowing that every ancestor in the family tree has a unique psychological story to tell — enjoy your time as you discover and reflect upon them. ●

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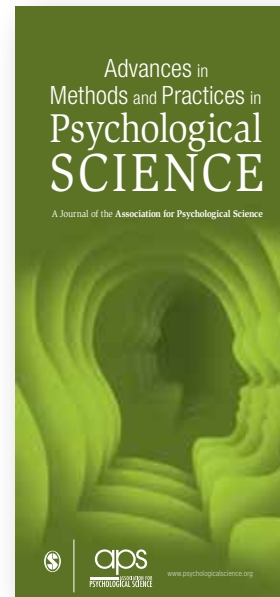
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**Registered Replication Reports

Edited by C. Nathan DeWall and David G. Myers

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Digital-Media Use and Mental Health: A Teachable Example of Psychological Science Shining Its Light

By David G. Myers

Twenge, J. (2019). More time on technology, less happiness? Associations between digital-media use and psychological well-being. *Current Directions in Psychological Science*, 28, 372–379.
<https://doi.org/10.1177/0963721419838244>

The past decade has featured two striking social trends:

1. Soaring digital-media use, thanks to the spread of tablets, computers, and omnipresent smartphones — and to the social media, texting, web surfing, and gaming they enable, and

2. Lower child and adolescent well-being, as illustrated by increasing depression, anxiety, self-harm, and suicide among Canadian, American, and British teen girls (Mercado, Holland, Leemis, Stone, & Wang, 2017; Morgan et al., 2017; Statistics Canada, 2016; Twenge, Cooper, Joiner, Duffy, & Binau, 2019).

Are those two facts of life for our students' generation — which Jean Twenge (2017) calls the “iGen” — related? If there is a connection, is it big enough to matter? Does it have implications for parental guidance regarding daily screen time and social media use?

Aided by Twenge's (2019) accessible *Current Directions* synopsis, there could hardly be a better opportunity for engaging students in thinking about how psychological science can shine its light on these vital questions. For example, students could be invited

to write, and then pair and share, their answers to two questions:

To discern any possible association between digital-media use and mental health,

1. How might you assess people's mental health and well-being? Twenge reports data from studies of both positive well-being (self-reported happiness and life satisfaction¹) and of negative emotion (anxiety, depression, and suicide attempts).

2. What sorts of research could reveal whether there are (a) associations, and (b) causal connections between digital-media use and people's mental health and well-being? If you were a researcher, how might you explore these questions? Possible answers include:

- a. Correlational studies asking: Is digital-media use associated with mental health?

- b. Longitudinal studies asking: Does today's digital-media use predict future mental health?

Experimental studies asking: Do volunteers who are randomly assigned to reduced digital-media use fare better? That is, are they happier? Less depressed? Less lonely? Healthier? Less prone to misinformation?

Those are, indeed, the methods by which researchers have explored possible links between these two social trends. Twenge (2019) focuses primarily on correlational studies, some of which

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¹ In national surveys, happiness is often addressed with a simple question: “Taking all things together, how would you say things are these days — would you say that you are very happy, pretty happy, or not too happy?” Ed Diener and colleagues' widely used Satisfaction with Life Scale is also available for class use, with norms, at labs.psychology.illinois.edu/~ediener/SWLS.html.

have reported little *linear* correlation between screen time and mental health. In response, Twenge reports large surveys showing a *curvilinear* relationship — with self-reported light users (0.5 to 2 hr daily) exhibiting less anxiety and depression (and more happiness) than nonusers, but with the heaviest users (6 to > 7 hours) exhibiting the most anxiety and depression overall. Her Figure 2 illustrates these findings:

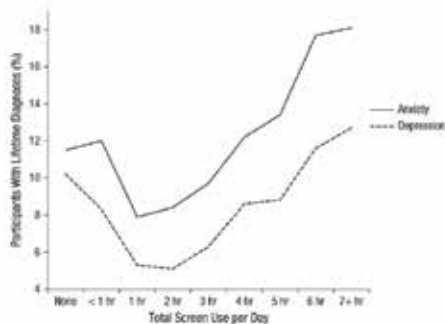


Fig. 2. Percentage of 14- to 17-year-olds with lifetime diagnoses of anxiety and depression as a function of their hours per day of screen use. Demographic controls are included. Data are from the National Survey of Children's Health (Twenge & Campbell, 2018).

Twenge also critiques correlational studies that

- did not control for face-to-face time (which is often somewhat higher in those who text and video chat, rather than spending hours gaming and web surfing),
- were conducted before the spread of smartphones (and today's elevated screen time), and
- used imprecise reporting usage categories (such as “never” or “almost every day”) rather than reported hours — or, better yet, app tracker hours.

In response to critics who note the small effect size — that is, the small percentage of well-being variance associated with digital-media use — Twenge argues that the more relevant question is this: What well-being difference is associated with different levels of digital-media use? She also recalls Rosnow and Rosenthal's (1989) reminder that interventions that explain a small percentage of variance may nevertheless halve negative outcomes.

Here's another question for class brainstorming: If indeed there is a curvilinear correlation between daily hours of digital-media use and mental health, what might explain the association? Possibilities include the following:

- Lower well-being causes more digital-media use. Might unhappy people spend more time alone, on screens? If so, longitudinal studies should find that misery predicts future screen time. But, Twenge reports, most such studies do not find this. Moreover, negative well-being increased *after* the spread of smartphones.
- More digital-media use causes lower well-being. Experiments that manipulate screen time find that, indeed, limited screen time decreased loneliness and depression.

Final question: Why might very high levels of digital-media use lower well-being? Again, students may anticipate some possible mediating influences:

- **Time drain:** Six or more daily hours of screen time surely displaces other activities — including sleep, face-to-face conversation, exercise, reading, and time spent outdoors — that might be better for mental health.
- **Social comparison:** Social media sites may engender upward comparison of oneself with cool, happy-seeming others.
- **Cyberbullying:** Online harassment and disparagement is a risk factor for depression.

Psychological science is a quest for truth that combines curiosity, exploration, skepticism, and humility. It explores important questions by various available methods. It draws conclusions. It welcomes others' scrutiny, criticism, and further evidence — and that is precisely what Twenge and Jonathan Haidt have done by curating an “ongoing semi-open-source literature review” which researchers and students can visit at tinyurl.com/MediaMentalHealth.

Their document discusses various correlational, longitudinal, and experimental studies. And mindful of their own vulnerability to confirmation bias, they have welcomed commentary by colleagues of varied perspectives. Haidt and Twenge's “work in progress” — with its accumulating evidence, tentative conclusions, and invited dissenting views — provides an exemplary model of psychological science and intellectual humility in action. ●

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“She sounds nice!”

By Beth Morling

Sidhu, D., & Pexman, P. (2019). The sound symbolism of names. *Current Directions in Psychological Science*, 28, 398–402. <https://doi.org/10.1177/0963721419850134>

Before your first day of class, you scan your roster and find yourself jumping to conclusions. “Mona Molloy — she sounds like a kind, conscientious person,” you think. Or, “Maybe I’ll get Katie Kiplinger to lead a small group. She sounds outgoing.”

Sound symbolism is a cognitive phenomenon in which the seemingly arbitrary phonemes of words become associated with the meanings of objects. A classic research example is the “maluma/takete” effect (Köhler, 1929). When shown Figure 1, most people assign *maluma* (which has softer, sonorous consonants) to the rounder shape. *Takete* (which has harsher, voiceless-stop consonants) gets put with the sharper one. Another sound-symbolism effect shows that high front vowels (such as “tee”) are affiliated with smaller objects; low back vowels (such as “taw”) go with larger ones.

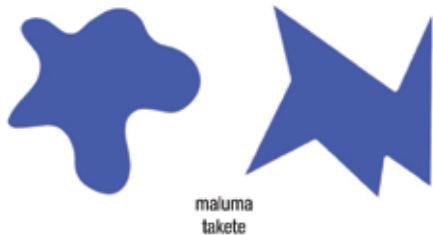


Fig. 1. An illustration of the kinds of shapes studied in the maluma-takete effect, which refers to individuals’ tendency to judge the nonword *maluma* as a better match for the rounded shape on the left and the nonword *takete* as a better match for the sharp shape on the right.

Figure 1. You can demonstrate the original *maluma/takete* effect with this stimulus set.

On the surface, sound symbolism introduces basic linguistic phenomena (such as phonemes and nonarbitrariness). It’s also an excellent first-day activity to introduce research, and this fascinating work provides a Trojan horse to introduce key concepts in methods and statistics such as null hypothesis testing, power,

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alternative explanations, and forming questions.

In *Current Directions*, David Sidhu and Penny Pexman describe how sound symbolism extends from abstract shapes (Fig. 1) to a social modality: people’s names. Names are useful for studying how sound symbolism generalizes because names can invite associations with new dimensions such as personality (Sidhu, Deschamps, Bourdage, & Pexman, 2019).

After showing students the *maluma/takete* example, you might ask: Would this effect work with people as well as objects? Show students Figure 2, asking, “Which figure is Bob vs. Kirk?” (see Sidhu & Pexman, 2015). Next, students can match names to traits using the stimulus sets in Table 1. Students should imagine that each name belongs to a person they have never met (try the slides available at bit.ly/2KP5lJ6).



Fig. 2. An illustration of the Bob-Kirk effect. When shown silhouettes such as these, participants were more likely to associate the one on the left with round-sounding names, such as Molly or Bob, and the one on the right with sharp-sounding names, such as Kate or Kirk (Sidhu & Pexman, 2015).

Figure 2. Ask students which silhouette is *Kirk* and which is *Bob*.

Stimulus Set	Notes from Sidhu and Pexman’s work
<i>Outgoing</i> Lanah Patty	Voiceless stop names were strongly associated with high <i>extraversion</i> traits
<i>Cooperative</i> Abel Eric	Sonorous names were strongly associated with high <i>agreeableness</i> traits.
<i>Honest</i> Lyle Titus	Neither type of name was consistently associated with <i>honesty-humility</i> traits.
<i>Philosophical</i> Morris Terry	Neither type of name was associated with high <i>openness</i> traits.
<i>Sensitive</i> Norah Tessa	Sonorous names were modestly associated with high <i>emotionality</i> traits.
<i>Hard-working</i> Megan Kate	Sonorous names were modestly associated with high <i>conscientiousness</i> traits.

Table 1. For each set, students select which person is more likely to have the trait in the center. In all pairings, the name on the left is sonorant, and the name on the right has a voiceless stop.

Sound symbolism might be just the thing to enhance your lessons in methods and statistics.

Introduce Null Hypothesis Testing and Chi Square

Null hypothesis significance testing is a notoriously difficult concept for students to learn. The sound-symbolism effect can introduce it intuitively.

In class, use the *cooperative* set from Table 1. Students can collect *Abel/Eric* data from a sample of their peers or you can run students in your own classroom. In a sample of 30, the null hypothesis states that 15 people should assign *cooperative* to *Abel* (a sonorous name) and 15 should assign it to *Eric* (a voiceless stop name). If 21 or more of the 30 people assign *cooperative* to *Abel*, your results are unlikely according to the null hypothesis. Sidhu and Pexman's Appendix provides names and traits to test — or use the slides at bit.ly/2KP5lJ6. To calculate chi square, use the second, “custom” calculator at quantpsy.org/chisq/chisq.htm.

Teach Null Effects and Power

Sidhu et al. (2019) includes a test of whether people really do have personalities that match their names (Experiment 3). The researchers tested a sample of more than 1,000 people to examine whether those with sonorous names have more agreeable traits and whether those with voiceless stop names are more extraverted. They found no meaningful relationships. In a statistics class, you could discuss why the researchers used a relatively large sample in this study (compared with the perception studies): They wanted to be able to detect even a very small relationship between name and personality.

Teach About Alternative Explanations

Participants' previous experience with people named “Linus” (a gentle boy with a blanket) or “Katie” (a chipper news reporter) are an alternative explanation for why sounds and traits go together. To rule out this possibility, they conducted their name-pairing

study again (Sidhu et al., 2019, Study 4), using invented names with the same sounds. For example, instead of responding to “Linus,” “Mara,” “Kasey,” or “Pippa,” people responded to “Nisul,” “Rama,” “Tasey,” or “Teepa.”

Inspire Wonder

The sound-symbolism effect will inspire wonder and curiosity from students, who might ask their own research questions:

- Does the effect work in other languages and cultures?
- Do famous authors exploit this phenomenon in novels and poems?
- Does this effect generalize to brand names, such as IKEA tables or new prescription drugs?
- What about names that blend sonorous and voiceless stop phonemes?

Capitalize on students' interest by prompting them to defend their reasoning (“Why would you expect it to work in other cultures? Why might it not?”). Help them conduct literature searches for studies that may have already tested this question, starting with the references of current articles. Finally, students can adapt stimuli to test their own hypotheses (for example, a list of sonorant and voiceless stop names is available in the appendix of Sidhu et al., 2019, and a complete set of aliens with sharp and round bodies is available in this Google folder: tinyurl.com/yyguuj7z). (Ask your institution whether class-based research needs IRB approval.)

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Advice for Future Graduate Students

By Jessica Costello

You've finished your bachelor's degree. What does the remainder of your path hold? For many psychology students who want to become clinicians or go into the academic realm of research and teaching, the next logical step is finding the ideal graduate program. Both master's and doctoral programs have their drawbacks and benefits, but there are some general tips for navigating life as a graduate student that should benefit you no matter what degree you decide to pursue.

Getting In

When applying, impressive grades and GRE scores will be great, but they might not weigh as much as research experience or a unique internship when the admissions committee is deciding your fate. Rather than focusing solely on whether you passed your classes, master's and doctoral programs place greater emphasis on completing original research or gaining hands-on experience through lab work, practica, or internships. All of this will improve your long-term career prospects. Doctoral students have to complete and defend a dissertation composed entirely of original research before receiving their degree, so graduate schools want to know that the students they admit have strong research training potential.

I was surprised and rather intimidated to learn that my graduate institution considers any grade below B– to be a failing grade, and this is not uncommon among graduate programs. But



Because of the collaborative nature of research training, your professors and mentors will most likely treat you more like an equal than a student. You're still learning, but you'll share more responsibility for their work. ”

Jessica Costello is a first-year master's student at Assumption College in Worcester, Massachusetts, specializing in clinical counseling psychology and working as a graduate research fellow. Her current research investigates the relationship between emotion induction and openness to persuasion. She is also interested in effective study habits and the cognitive processes behind writing. You can follow her on Twitter and Instagram @jcostellowrites.

as a general rule, graduate programs focus less on grades than traditional undergraduate courses because they aim to prepare you for a career.

This isn't to say that graduate academics don't matter at all. Exams will be less about memorizing facts or concepts and more about integrating ideas into practical applications. Most classes only meet once a week and assign mountains of reading or hefty assignments, so prepare to do a lot more work than you may have for your undergraduate classes.

These assignments will be specialized, because the career you're preparing for will be in a narrow specialty of psychological science. Early on in your graduate career, you'll have to decide which of the psychological subfields you're most interested in, apply to the programs specializing in that area, and articulate what about that topic excites you. As an undergraduate, you probably had opportunities to explore different areas of study and take electives in whatever you found interesting, but at the graduate level, the curriculum is generally designed to sharpen your skills in a specific field.

Making Connections

Graduate school is also about forming relationships and networking with your professors as well as your peers. Potential doctoral students will need to identify particular faculty members with whom they want to work, and hope that these people are accepting new students into their labs. You want to find a mentor whose research interests are similar to your own, so they can guide you along the processes of conducting experiments, presenting at conferences, and submitting manuscripts for publication in an area that excites you. It is also critical to find a mentor who is an expert in your research areas, because they will have a large network of colleagues in this field who will become potential collaborators for your current and future research. At this level, it's about laying the groundwork for a productive, long-term career, and that involves networking beyond your own lab or institution.

Because of the collaborative nature of research training, your professors and mentors will most likely treat you more like an equal than a student. You're still learning, but you'll share more responsibility for their work. Because you're more like colleagues now, you will engage with your advisor and other professors in open dialogue about your research ideas and lab work. In classes, professors will challenge you to think critically about everything, and it will be okay to openly disagree with them. In order to get the most out of our training experiences, we must be willing to look for flaws and holes in previous research and the ideas that led to it.

Comparisons With Your Peers

Perhaps because psychological science is such a broad and diverse field, even undergraduates can easily feel a sense of competition with their peers. Every semester it can seem like someone else just started the perfect internship or made lasting connections with an awesome faculty member (and future writer of recommendations) in their research lab. Everyone in my undergraduate institution was doing something different, and even though I also interned and presented research at a national conference, somehow my own experiences always felt like they came up short.

What this cycle of unhealthy comparisons taught me was that I could control only how well I did, and I pushed myself to succeed at the opportunities I had been given. Because there are a limited number of jobs in each area of psychology, graduate school will probably feel even more competitive. But remember that the other students are sharing the classroom and research experiences and are generally going through the same stages at the same time. All the students are on their own timelines and pursue their individual paths depending on their interests.

Furthermore, the success of our peers means that others are enriching their own lives and taking psychological science in innovative directions. One person's success does not take away

from another's, and for every acceptance or step forward in their career, they probably have countless other "failures" that go unnoticed.

Graduate school is a challenging step, but one that will force you to grow and that will prepare you for your future in psychological research. Exactly what that looks like is up to you. ●

Suggested Reading

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MEMBERS *in the news*

Nicholas Allen, University of Oregon, *Science*, August 21, 2019: Suicide Attempts Are Hard to Anticipate. A Study That Tracks Teens' Cellphone Use Aims to Change That.

Sian Beilock, Barnard College, *Forbes*, August 6, 2019: One Secret to Success: Take Your Brain on a Vacation.

Mina Cikara, Harvard University, NPR, July 29, 2019: You 2.0: The Empathy Gym.

David DeSteno, Northeastern University, *The Washington Post*, August 22, 2019: How to Overcome 'Compassion Fatigue'.

aps **Karen Douglas**, University of Kent, UK, *TIME*, July 29, 2019: Why Are Area 51 Conspiracy Theories So Popular? Here's What Psychologists Say.

aps **Jennifer L. Eberhardt**, Stanford University, *Stanford News*, August 12, 2019: Venture Capital Funds Led by People of Color Face More Bias the Better They Perform, Stanford Researchers Find.

Sarah Gaither, Duke University, *The New York Times*, August 22, 2019: To Promote Inclusivity, Stay Away From Personality Assessments.

aps **Francesca Gino**, Harvard University, NPR, August 19, 2019: You 2.0: Rebel With a Cause.

The First Peak Among Many



The emotional peak of achieving our goals can force us confront an uncomfortable question: If this is my peak, when do things start to go downhill? Research by APS Fellows **Sonja Lyubomirsky** and **Steven Hayes**, however, suggests that it doesn't have to be this way. In fact, experiencing positive emotions has been found to position us for future success.

The New York Times

August 8, 2019

A Bit of Binge-Watching Can Help the Exercise Go Down



Temptation bundling by pairing healthy activities with something you already enjoy, like jumping on the treadmill and watching your favorite show, can help new habits stick, says APS Fellow **Katherine Milkman**. 'Understanding' and 'doing' are two entirely different things, however, adds APS Fellow **Wendy Wood** — even experts on habit formation can still struggle to apply these findings in their own lives.

NPR

August 16, 2019

Steven Hayes, University of Nevada, Reno, *The New York Times*, August 8, 2019: Always Waiting for the Other Shoe to Drop? Here's How to Quit Worrying.

aps **Saul Kassin**, John Jay College of Criminal Justice, NBC, September 5, 2019: Leading Expert Explains Why You Would Falsely Confess to a Crime You Did Not Commit.

Kevin LaBar, Duke University, NIH Office of Behavioral and Social Sciences Research, August 19, 2019, Seeing Is Feeling – How Artificial Intelligence Is Helping Us Understand Emotions.

Daniel Lim, The Pennsylvania State University, *The Washington Post*, August 22, 2019: How to Overcome 'Compassion Fatigue'.

aps **Elizabeth Loftus**, University of California, Irvine, *Rolling Stone*, August 22, 2019: Fake News Can Give Us False Memories, Study Finds.

Sonja Lyubomirsky, University of California, Riverside, *The New York Times*, August 8, 2019: Always Waiting for the Other Shoe to Drop? Here's How to Quit Worrying.

Anthony Mancini, Pace University, *The Mercury News*, September 8, 2019: For Conception Crew, Surviving the Fire Is Just the First Step in a Long Healing Process.

The Devil You Don't Know



Horrific acts of mass violence and murder captivate news consumers, but APS Fellow **Abigail Marsh** — who studies empathetic extremes through her work with kidney donors and psychopathic teenagers — argues that it's the rarity of these heinous events that may cause our brains to spiral into paranoia. Our inability to conceive of what drives such violence can lead us to fear it's lurking around every corner.

The Washington Post

August 6, 2019

Hazel Markus, Stanford University, *Stanford News*, August 12, 2019: Venture Capital Funds Led by People of Color Face More Bias the Better They Perform, Stanford Researchers Find.

Abigail Marsh, Georgetown University, *The Washington Post*, August 6, 2019: You're Probably More Freaked Out About the World Than You Should Be.

More APS Members
in the news online at

[www.psychologicalscience.org/
MembersInTheNews](http://www.psychologicalscience.org/MembersInTheNews)



Kelly McGonigal, Stanford University, NPR, August 2, 2019: Kelly McGonigal: Can We Reframe the Way We Think About Stress?

Katy Milkman, The Wharton School of the University of Pennsylvania, NPR, August 16, 2019: Fresh Starts, Guilty Pleasures and Other Pro Tips for Sticking to Good Habits.



Candice Odgers, NPR, August 27, 2019: The Scientific Debate Over Teens, Screens and Mental Health.

Kristina Olson, University of Washington, *Seattle Times*, September 1, 2019: UW Psychologist Kristina Olson Thought the MacArthur Foundation Had the Wrong 'Genius.'



Amy Orben, University of Oxford, UK, NPR, August 27, 2019: The Scientific Debate Over Teens, Screens and Mental Health.



Zachary Rosenthal, Duke University, NPR, August 19, 2019: Got Pain? A Virtual Swim With Dolphins May Help Melt It Away.

Rebecca Saxe, MIT, NPR, July 29, 2019: You 2.0: The Empathy Gym.



Eldar Shafir, Princeton, NPR, August 5, 2019: You 2.0: Tunnel Vision.

Diana Tamir, Princeton University, NPR, July 29, 2019: You 2.0: The Empathy Gym.

Barbara Tversky, Teachers College, Columbia University and Stanford University, *The Wall Street Journal*, August 16, 2019: 'Mind In Motion' Review: No Ideas but in Things.



Jean Twenge, San Diego State University, NPR, August 27, 2019: The Scientific Debate Over Teens, Screens and Mental Health.



Simine Vazire, University of California, Davis, SAGE, August 15, 2019: Video: APS Panel Discusses Nexus of Impact and Life.

Kathleen Vohs, University of Minnesota, *The Wall Street Journal*, August 23, 2019: The Joy of Clutter: What Marie Kondo Got Wrong.

Tor Wager, University of Colorado, Boulder, NIH Office of Behavioral and Social Sciences Research, August 19, 2019, Seeing Is Feeling – How Artificial Intelligence Is Helping Us Understand Emotions.

Daniel Willingham, University of Virginia, *The New York Times*, August 22, 2019: Stop Posting Your Child's Tantrum on Instagram.

Wendy Wood, University of Southern California, NPR, August 16, 2019: Fresh Starts, Guilty Pleasures and Other Pro Tips for Sticking to Good Habits.



Coverage of research from an APS journal



Podcast included in coverage



Video included in coverage



2020 APS Convention Speaker
Chicago, IL, USA, May 21–24, 2020

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INDIANA

Purdue University Northwest

Director of Clinical Training

The Department of Psychology in the College of Humanities, Education, and Social Sciences at Purdue University Northwest (PNW) with campuses in Hammond and Westville, Indiana, invites applications from individuals with experience in doctoral level clinical psychology programs for a full-time faculty position as Director of Clinical Training. This position will provide leadership for the development of the PsyD program. The person will be hired at the Professor or Associate Professor level and will have major responsibility for developing and implementing a high quality program eligible for APA accreditation. **Qualifications/Requirements** The candidate must hold a PhD in Clinical Psychology from an APA accredited program and have experience teaching at the doctoral level as well as experience directing dissertations and supervising graduate students. The successful candidate must be license-eligible in Indiana and be licensed within one year of the hire date. **Position Responsibilities:** **Initial responsibilities:** Develop curriculum, and course schedule for the MS & PsyD degrees, Develop clinical courses not already in Purdue's Graduate Catalogue, Establish a clinic for training and providing therapy to local residents, Write Graduate Student Handbook, Recruit and hire additional clinical faculty required for a high quality PsyD program, Submit proposal for new graduate program to Purdue University Graduate School, Request approval for the new program from Purdue's Board of Trustees, Obtain approval for the program from the Indiana Commission on Higher Education, Gain accreditation from the Higher Learning Commission, Apply for provisional accreditation from the American Psychological Association. **Ongoing responsibilities:** Manage program's day to day activities such as evaluating student and faculty performance, arranging meetings of program committees, resolving student and faculty complaints, advising and supervising students, and monitoring clinic and internship sites, Establish and maintain contacts with local, state, and federal agencies for possible funding, training, and research opportunities, Write the

annual APA report and all other recurring accreditation reports, Write letters certifying students' readiness to begin internships and subsequently to certify qualification for licensure, Review transfer credit applications, Remain informed on accreditation and licensure issues, Maintain own license to practice, Regularly review and update program policies and procedures. **Applications:** Review of applications will begin November 1, 2019 and will continue until the position is filled. To apply please visit www.pnw.edu/careers click on "Search and Apply for Positions" then Click on "Faculty". Applicants should submit the following: 1) a cover letter specifically addressing experience and qualifications; 2) a curriculum vitae; 3) and list of at least three professional references. Additional Information Visit our web site www.pnw.edu for additional information about the University. For information regarding our excellent benefits package, visit www.purdue.edu/benefits. A background check will be required for employment in this position. Purdue University is an EEO/AA employer fully committed to achieving a diverse workforce. All individuals, including minorities, women, individuals with disabilities, and protected veterans are encouraged to apply. For more information, please see: www.purdue.edu/ethics/policies/FosteringRespect_accessible.pdf.

MASSACHUSETTS

Tufts University

Tenure-Track Assistant Professor in Quantitative/Computational Psychology

The Department of Psychology at Tufts University is seeking applicants at the tenure-track assistant professor level for a named assistant professorship in Cognitive Science in the area of quantitative/computational psychology to begin September 1, 2020. The successful applicant will have a Ph.D. in Psychology or a closely-related discipline by the appointment start date and an active research program capable of supporting extramural funding. Candidates must connect to and support our graduate and undergraduate programs in Cognitive Science and must have expertise developing or using sophisticated statistical, quantitative, and/or computational models that can address theory-driven questions that span Cognitive Science and Neuroscience. The ideal candidate's research program will study issues bridging to current Psychology faculty research foci and preference will be given to researchers who can capitalize on the use of a pending intellectual property (IP) gift to Tufts of technology permitting brain/computer interaction. We are particularly interested in applicants whose research tools and approaches include: psychometrics, functional neuroimaging, dynamical systems, intensive longitudinal analysis, functional data analysis, social networks, or nonparametric statistics. Candidates should be willing to teach courses that contribute to the statistical training of our Psychology and Cognitive Science graduate students; teaching load is four courses per year, with opportunities for workload-related reductions. Applicants should submit to <http://apply.interfolio.com/65064> the following: a C.V.; a statement of research accomplishments and future plans (including those relevant to the IP mentioned above; note that our department embraces open and reproducible science, and candidates are also encouraged to address how they pursue these goals in their work); a statement of teaching experience and approach; three letters of recommendation which should be uploaded by your recommenders to Interfolio directly; copies of representative scholarly work; and a diversity statement that describes the candidate's aspirations and potential for promoting diversity and inclusion in their professional career. Please contact Jessica Storozuk, Department Manager, at jessica.Storozuk@tufts.edu with any questions. Review of applications will begin October 1, 2019, and will continue until the position is filled. Tufts University, founded in 1852, prioritizes quality teaching, highly competitive basic and applied research, and a commitment to active citizenship locally, regionally, and globally. Tufts University also prides itself on creating a diverse, equitable, and inclusive community. Current and prospective employees of the university are expected to have and continuously develop skill in, and disposition for, positively engaging with a diverse population of faculty, staff, and students. Tufts University is an Equal Opportunity/Affirmative Action Employer. We are committed to increasing the diversity of our faculty and staff and fostering their success when hired. Members of underrepresented groups are welcome and strongly encouraged to apply. If you are an applicant with a disability who is unable to use our online tools to search and apply for jobs, please contact us by calling Johny Laine in the Office of Equal Opportunity (OEO) at 617-627-3298 or at johny.laine@tufts.edu. Applicants can learn more about requesting reasonable accommodations at <http://oeo.tufts.edu>.

ANNOUNCEMENTS

Send items to apsobserver@psychologicalscience.org

GRANTS

CASBS Accepting 2020–2021 Fellowship Applications

The Center for Advanced Study in the Behavioral Sciences (CASBS) at Stanford University is now accepting applications for residential fellowships for the 2020–21 academic year.

The Center offers a residential fellowship program for scholars working in a diverse range of disciplines that contribute to advancing research and thinking in social science. Fellows represent the core social and behavioral sciences, but also the humanities, education, linguistics, communications, and the biological, natural, health, and computer sciences.

Applications from individuals at any career stage are welcomed; early to mid-career individuals are especially encouraged to apply.

Application Deadline: November 1, 2019

For more information, visit the CASBS website at <https://casbs.stanford.edu/apply-casbs-fellowship>.

James McKeen Cattell Fund Sabbatical Support

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

Applications are due January 15, 2020.

For more information, see the ad on p.8 or visit www.cattell.duke.edu.

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.

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

Society for the Study of Human Development Biennial Meeting

October 11–13, 2019
Portland, Oregon
sshdonline.org

2019 Behavior, Energy & Climate Change Conference

November 17–20, 2019
Sacramento, CA
beccconference.org

42nd Annual National Institute on the Teaching of Psychology

January 3–6, 2020
St. Pete Beach, FL
nitop.org/

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
Rhodes Island, Greece
issbd2020.org

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CONNECTING THE DOTS BETWEEN BIOLOGY AND ADDICTION

*With \$2.3 million from the National Institutes of Health Director's Pioneer Award, Emory University psychological scientist **Rohan Palmer** is mining huge datasets to study how genetic differences leave some people vulnerable to substance addiction.*



Rohan Palmer

How did you become interested in behavioral genetics, and in addiction?

I have always been fascinated by individual differences. I initially focused on a career in medicine, but opted to pursue behavioral genetics because it allowed me to be at the intersection of so many areas of science at a time when whole genome data was becoming readily accessible. I quickly learned that studying the effects of genes, environments, and gene x environment interaction within developmental contexts are integral to understanding human behavior. Studying addiction has allowed me to understand and give back to an area of science, communities, and individuals struggling with substance misuse. In much of my work, I highlight the fact that although substance involvement may appear normative, there are many underlying diseases and traits, such as depressive symptoms, that undercut individual differences that are masked by a focus on diagnostic outcomes.

What specifically are you investigating with the funding from the NIH Director's Pioneer Award?

My team and I are investigating two central questions in the field of addiction genetics. First, how can we enhance our ability to prioritize genetic variants of interest from genome-wide association studies (GWAS)? Second, what components are necessary for a robust genomic prediction model of substance addiction?

How is the research being conducted? What are the methods you're using?

Part of what we are doing involves the use of raw genomic data to estimate the kinship between tens and hundreds of thousands of individuals who differ in their level of substance involvement. One way we are addressing the first goal is by working with other model-organisms to understand which genes and gene regulatory regions influence sensitivity to the presence of alcohol, cocaine, nicotine, and other substances. Our goal with these data has been to determine how networks of genetic variation play a greater role in substance behaviors than we would expect by chance. For our second goal, we are developing and testing theoretical models of substance use behaviors using genome-wide association evidence for different substances (e.g., our recent GWAS on Opioid Dependence), as well as integrating evidence across relevant traits and diseases using multivariate methods.

What outcomes/societal benefits are you hoping will come from your work?

With each set of studies, we bring additional clarity to the role of various sets of genetic variants in substance addiction. In addition to that, this project brings insight to how we utilize genome-wide data to understand risk for substance addiction by developing a reference resource for inferring addiction risk. The current method for risk prediction is the use of polygenic scores, but sample sizes are still too small to realize the full potential of genome-wide association studies. The platform that we envision for researchers will allow them to apply predictive models in a quasi-experimental manner, which will help to realize the implications of genome-wide risk in society.

Read the full interview online at psychologicalscience.org/observer/biology-addiction



Read the full interview online at
[psychologicalscience.org/observer/
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