Observer

VOL. 34, NO. 4 ● JULY/AUGUST 2021

The Future of Work

Where and
how work gets
done—and
who does it—
may never be
the same.

Observer

Unless otherwise indicated, all images other than author photos and graphics from APS research are from Getty Images.

Published 6 times per year by the Association for Psychological Science, the *Observer* educates and informs the Association on matters affecting the research, academic, and applied disciplines of psychology; promotes the scientific values of APS Members; reports and comments on issues of international interest to the psychological scientist community; and provides a vehicle for the dissemination of information on APS.

ADVERTISING**:** The *Observer* accepts employment and commercial advertising. Information, rates, and calendar are available by calling +1 202.293.9300 or going online to www.psychologicalscience.org/advertise.

FEEDBACK**:** The *Observer* welcomes your comments and feedback. Please email letters to apsobserver@psychologicalscience.org. Unless otherwise indicated, all correspondence received will be considered for publication in the *Observer* Forum section of the magazine. An APS staffer may contact you for additional information. The *Observer* does not guarantee publication and reserves the right to edit for length and style.

SUBMISSIONS**:** The *Observer* accepts original manuscripts, announcements, and first-person narratives for publication; manuscripts must be original and should not have been published or scheduled to be published elsewhere. The *Observer* editorial calendar is at the discretion of the editor, and the *Observer* does not guarantee publication. Submissions should be sent via email to apsobserver@psychologicalscience.org. The *Observer* reserves the right to edit all content for length and style.

ON THE COVER**:** As automation displaces growing numbers of workers and technology enables doing even more jobs from anywhere, research points to shifting expectations about the post-pandemic workscape. Cover art and other images throughout this issue from Getty Images.

Observer

“[I]n many cases, the messy real worlds of police departments, classrooms, doctors' offices, and organizational C-suites present basic psychological questions, as well as ways to address them, which in turn can fuel the science. Lee [Ross] knew this and was especially adamant about the pressing need to get more of these worlds into our science. We write this column in his honor and to forward this case. ”

—JENNIFER EBERHARDT,
PRESIDENTIAL COLUMN, PAGE 6

Much More ONLINE

Putting Psych Science to Work for Government
Learn about the various career paths that can lead to work at the U.S. Office of Evaluation Sciences, plus more from the APS Student and Early-Career Webinar Series at psychologicalscience.org/webinars.

Meet the Program Officers: NSF Perception, Action, & Cognition
Get to know the officials behind one of the most influential funders of psychological scientists, and watch other APS funding and policy webinars, at psychologicalscience.org/government-relations-webinars.

Virtual Networking for Scientists
Get techniques and strategies for making connections remotely at psychologicalscience.org/virtual-networking-webinar.

For Work-Family Balance, Give Policy a Personal Touch
Informal social support is essential for helping employees maintain work-family balance without facing professional consequences. Read at psychologicalscience.org/work-family-policy.

Current Directions in Psychological Science Podcast
Journal Editor Robert Goldstone invites researchers to dive deeper into the compelling insights behind their recently published research. Listen at psychologicalscience.org/news/podcast-news.

The Psychological Science of Racism: Expert Panel

Researchers spoke about the toll discrimination takes on physical and mental health, particularly in relation to violence and bias against Asian Americans. Watch at psychologicalscience.org/racism-expert-panel.

Members in the Media

Visit psychologicalscience.org/mitm-archive to view media coverage of our members' research and to learn more about how they are sharing psychological science with the public.

The Many Benefits of Working Remotely

Teleworkers have been found to receive higher job-performance ratings when doing complex and independent work. Read at psychologicalscience.org/telecommuting-effects.

Plus More Member News

Read about APS Fellows being selected for prestigious awards and appointments, as well as notable losses among the psychological science community. Visit psychologicalscience.org/observations and follow APS on Twitter (@PsychScience).

Older Adults More Likely to Make the Effort to Help Others

New research suggests that, all things being equal, older adults are more likely to offer help than younger adults. Read at psychologicalscience.org/prosocial-effort.

PCSAS Licensing Parity in Arizona

In April, programs approved by the Psychological Clinical Science Accreditation System (PCSAS) were declared to meet the licensing requirements for practice in Arizona. Read more at psychologicalscience.org/PCSAS-Arizona-Licensing.

BRINGING THE WORLD INTO OUR SCIENCE

By **Jennifer Eberhardt, APS President, along with Hazel Rose Markus and MarYam Hamedani**

Photo credit: Nana Kofi Nti

In May, we lost a giant in the field of psychological science. Among his many field-shaping contributions, Lee Ross, as his colleagues and students know well, often made the case for getting more of the science into the world and more of the world into the science.

As APS's current president, I am writing my inaugural column with my two colleagues at Stanford SPARQ. SPARQ is a "do tank" that partners with industry leaders and changemakers to reduce societal disparities and bridge social divides using insights from behavioral science. Lee was an affiliate of SPARQ, and his aim of getting more of the science into the world animates our work. Although it does not have to be this way, science often goes with "basic" and the world goes with "applied." From its origins, psychology has straddled and struggled with this basic/applied binary. At SPARQ, we find that this binary often dissolves quickly when researchers and practitioners work in collaboration to address society's most pressing needs. In some cases, the science provides approaches and answers to applied problems. Yet in many cases, the messy real worlds of police departments, classrooms, doctors' offices, and organizational C-suites present basic psychological questions, as well as ways to address them, which in turn can fuel the science. Lee knew this and was especially adamant about the pressing need to get more of these worlds into our science. We write this column in his honor and to forward this case.

In his last, but unpublished, paper, titled "Dissonance Theory Redux: Re-uniting Leon and Lewin," Lee continued to highlight this need. The title refers to how people rationalize their decisions after the fact. It juxtaposes the ideas of Leon Festinger, the originator of dissonance theory, with those of his mentor Kurt Lewin, who created the idea of action research, meaning research that applies psychological principles to the concerns of the day. Reflecting on his time as a PhD student at Columbia University in the 1960s, Lee pointed out that the significance of dissonance reduction was immediately and widely appreciated by scientists and laypeople alike. Yet, echoing Lewin, he asked why most psychologists avoided applying dissonance to socially relevant issues, why they focused nearly exclusively on dissonance in individuals, and why they stopped short of probing whether and how political, legal, and military actors and powerful advocacy groups rationalized their dissonance-producing decisions and actions during times of major societal turmoil, including McCarthyism, desegregation, and the Vietnam War.

Lee concluded that Festinger and his colleagues knew how large a role dissonance played in contemporary American life (see for example, Riecken, Festinger, & Schachter, 1956). Yet they also knew that modeling the intensity and complexity of the real world would be difficult. They opted instead to simulate milder dissonance-provoking situations in the lab. The result was many well-controlled and clever studies that elaborated and extended dissonance theory. Surely, Lee mused, if these social psychologists had continued to investigate actual contemporary events and actors, they would have elaborated the important phenomenon of collective rationalization and would have come to anticipate how people justify their decisions and outcomes through seeking out the comfort of like-minded peers—something that is now in high relief across the political spectrum. He concluded that if psychologists had endeavored to put more of the world into their science, today we would have better theories and suggestions for the debilitating political divides and the dangerous economic, environmental, and social challenges that threaten the world. We should not abandon the real world for the laboratory but, rather, pursue both tracks.

APS President **Jennifer L. Eberhardt** is Morris M. Doyle Centennial Professor of Public Policy and Faculty Co-Director of Stanford SPARQ. She studies race and inequality in a wide variety of places, including law enforcement agencies, courts, schools, neighborhoods, and workplaces. She is the author of *Biased: Uncovering the Hidden Prejudice That Shapes What We See, Think, and Do*. Eberhardt may be contacted at president@psychologicalscience.org.

Indeed, the turmoil and pain of the past year and a half shows how terribly urgent our social problems are and how critical a psychological perspective is to forge a path forward. As a global pandemic raged on, George Floyd's killing in the United States sparked a racial reckoning, and the 2020 election tore a struggling nation even further apart, our students and colleagues repeatedly asked the following question: Does what we do actually matter in the world? Reflecting on Lee's passing and the current state of the field, we are of two minds.

On the one hand, psychologists have been more successful than ever in getting our science into the world. The explosion of books and articles written by psychologists aimed at general audiences has increased exponentially in the past decade or so. From media coverage of psychologists and their ideas—from the news to podcasts to social media—we see that public engagement has been on the rise. Newsletters and online magazines like *Behavioral Scientist, Greater Good Magazine*, and *The Conversation* are new channels for spreading ideas. Organizations like APS regularly organize events geared toward journalists and policymakers. APS, in fact, recently introduced researcher spotlights that expose journalists to panels of experts who can speak on topics from hate crimes against Asian Americans and Pacific Islanders to healing police-community divides. Workshops and conferences around the country increasingly offer opportunities for new and seasoned psychologists alike to bolster their science communication skills. Even traditional basic science funders like the National Science Foundation now require substantial evidence of the broader impacts of the research they support. As a result, practitioners across industries are increasingly open to the value of behavioral science and are seeking it out.

At the same time, the field continues to debate the challenges of conducting psychological science that is, from the start, rooted in and inspired by the problems of the world, underscoring the enduring hold of the basic/applied binary. In a recent paper, Berkman and Wilson (2021) contended that most psychological research suffers from a lack of relevance, accessibility, and applicability to addressing societal problems. In a review of 360 articles from the first two sections of the *Journal of Personality and Social Psychology*, they found that only one provided concrete, implementable solutions to a social issue. In another piece, Ellsworth (2021) highlighted the challenges researchers face when conducting research relevant to social issues, especially the risk that their research could be viewed as less rigorous or foundational and more partisan. Further, given this metascience moment of critical reflection on the field concerning issues of replicability, open science, and racial and gender bias, Lewis and Wai (2021) asked, what can and should psychological scientists be responsibly communicating to the public about what we know? Indeed, the value of scientific expertise as a whole has been under significant threat in the public sphere, in areas where we could use it most—from the coronavirus pandemic to climate change (Hoffman, 2021).

Given these pressures and the harsh spotlight that can fall on researchers who are in the public eye, psychological scientists worry that their research has to be perfect—that they have to have the complete and right answers to the complex questions of the day. Yet many research insights do not directly and neatly provide solutions to the problems at hand. What we know is often not relevant or specific enough to be applied or implemented. ➡

Hazel Rose Markus

MarYam Hamedani

Hazel Rose Markus is Davis-Brack Professor in the Behavioral Sciences and Faculty Co-Director of Stanford SPARQ. Co-author of *Clash!: How to Thrive in a Multicultural World*, she studies how cultures, including those of nation or region of origin, race, ethnicity, gender, social class, religion, and occupation, shape people's thoughts, feelings, motivations, and actions.

MarYam Hamedani is Managing Director and Senior Research Scientist at Stanford SPARQ. As an expert on culture, race, and research-practice partnerships, she studies and puts into practice strategies to help people live, work, and thrive in today's increasingly diverse and divided world.

Expert Panel: Policing and Racism, Insights from Psychological Science

On May 21, APS convened a panel of experts on policing and racism, including Jennifer Eberhardt, to discuss the latest scientific research and share insights into the factors behind racial bias during police encounters. Access the video and transcript at psychologicalscience.org/expert-panel-policing. Also see the article on page 27 of this issue of the *Observer*.
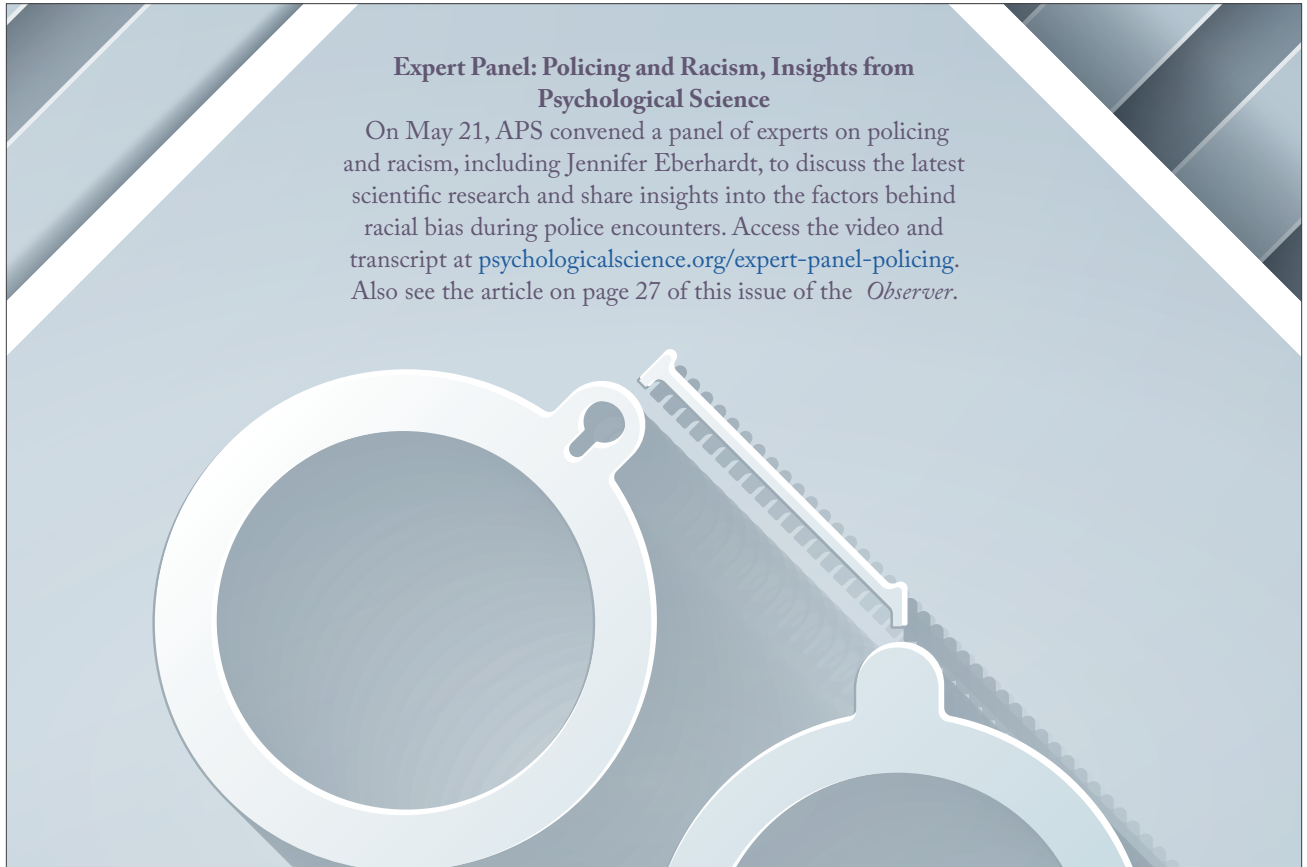
Much of "basic" psychological science is still based on laboratory studies (and increasingly online "as-if" studies), often with college students or samples from WEIRD (White, educated, industrialized, rich, and democratic) cultures, studying phenomena that are decontextualized from the real world and real problems. Psychologists also worry that their work will not replicate or be of value if it is not yet field-tested. Or, even if they have tried to field-test their insights, they may have become discouraged by the messiness, complexity, and often substantial time and effort required of trying to do so.

With these challenges in mind, how can researchers get more of the world into our science? One approach is to relax the requirement that we alone should have the answers to sticky, complex problems. We could do more work across disciplinary lines—with economists, neuroscientists, sociolo-gists, political scientists, computer scientists, and linguists—to not only develop more sophisticated understandings of the challenges we face but demonstrate the value of science in addressing those challenges. We should embrace "team science" and the diversity, rigor, and relevance that it affords (see Ledgerwood et al., in press).

There are tangible benefits not only in working with scientists in other fields, but also in working directly in the field where the problems are located and with the practitioners who are there grappling with those problems. When we challenge ourselves to do this, at the very least, we come away with a better understanding of what the problems are that science could be used to solve. In an effort to bring more of the world into our science, APS will soon introduce practitioner spotlights that will expose psychological scientists to practitioners who are closer to the problems that plague us than scientists typically are.

At SPARQ, we have been working hard to put both of these strategies into action, developing partnerships with scientists beyond our field and practitio-ners beyond our laboratories. For example, since 2014, we have worked with computational linguists and computer scientists at Stanford to analyze police-community interactions during routine traffic stops using body-camera footage. Across the country, tens of millions of U.S. drivers are stopped by police each year. These interactions are consequential. They are the context through which trust is built or eroded on a daily basis. Until now, we did not really have a good way of observing how officers communicate with the public. But with the spread of body cameras, we now have access to how these interactions unfold in real time. The footage from these cameras allows us to look for patterns across many

interactions, equipping us to test the extent to which there are differences in the respect officers communicate to Black and White drivers.

We worked with the Oakland Police Department in California to gain access to footage from nearly 1,000 traffic stops conducted by 245 officers and used machine learning techniques to comb through the words officers used during these stops. We found that, even when officers were behaving professionally, they spoke less respectfully to Black drivers than to White drivers: They used more formal titles with White drivers, expressed more concern for the safety of White drivers, and offered more reassurance to White drivers (Voigt et al., 2017). In fact, based on the words officers used alone, we can use a model to predict whether an officer was talking to a Black person or a White person.

Most large law enforcement agencies have body cameras. Yet the vast majority of the footage from these cameras is never examined. How can we expect cameras to serve as an accountability tool when the footage is not analyzed, or even treated as data? This has implications far beyond traffic stops. We can use this footage to examine how no-knock warrants are executed on Black versus White suspects. We can look at how witness statements are taken. We can look at interrogation practices. We can look at

> **Psychological scientists are increasingly working to establish and scale labs and centers to make it possible for these kinds of research-practice partnerships to operate. Psychological scientists have also been doing pathbreaking work out in the world in government, industry, media, nonprofits, and more.**

training. In fact, after numerous community leaders urged the Oakland Police Department to "do something" after hearing about our findings, executives from the department not only invited us to present the takeaways of our findings to their sworn staff in a training on traffic stops, they also asked us to leverage the footage to evaluate that training. Rather than asking officers whether they liked the training (which is the standard evaluation metric in policing), we are now analyzing footage from those officers to see whether there are observable differences in their interactions with the public, pre- and post-training. This work would not be possible without the partnership of scientists in different disciplines or long-term relationships with law enforcement and the community in Oakland.

Whether we are working with linguists or computer scientists, police departments or community members, teachers or students, business executives or entry-level staff, our work across disciplines and out in the field has helped us to bring more of the world into our science. And the power of this perspective—why this work matters and is sorely needed—is growing in the field. Psychological scientists are increasingly working to establish and scale labs and centers to make it possible for these kinds of research-practice partnerships to operate. Psychological scientists have also been doing pathbreaking work out in the world in government, industry, media, nonprofits, and more. We need to open more channels to learn from them and feed their insights back into the field. We also need to get better at tracking our impact—looking not just at whether our ideas get out into the world but at how they are taken up, what kinds of changes they help spark, and how those changes can be sustained. When considering questions of open science, we also have to ask: open to whom, and for whom (e.g., Grzanka & Cole, 2021; Murphy et al., 2020; Roberts et al., 2020; Salter & Adams, 2013)? What about being open to the world and the communities it is meant to serve?

We fully acknowledge that the work of bringing the world into our science is time-consuming and hard. At a minimum, it requires spending significant time out in the field, learning practitioners' worlds, cultivating relationships, and navigating and negotiating numerous cultural clashes and divides. It involves being humble and curious, listening and learning, and not being discouraged by the messiness and complexity of the real world. Most researchers are not trained for this type of work. We also recognize that doing this work might not be for everyone or make sense at every career phase. Certainly, much more needs to be done to remake the culture, infrastructure, career opportunities, and reward systems of academia to even make space for bringing the world into our science (see Grzanka & Cole, 2021, for a recent discussion).

Another one of Lee's classic contributions to psychology was demonstrating the underestimated power of people's illusions that they see the world objectively, as it is, while those who have another perspective must be biased, ➡

uninformed, or irrational. What we argue here is that you cannot know the other's perspective unless you get much more proximate to it. As we work to get more of our science out into the world, we need to resist the pernicious pull of naïve realism—prodding us to be believe that we can solve the world's problems without the perspectives of practitioners and community members—without getting more of the world into our science. In a recent memorial for Lee, where many of his closest collaborators, students, and friends spoke of how he touched their lives and careers, one of the resounding themes was how they benefitted from his wisdom. We hope this tribute can serve as a call for our science to do the same. ◐
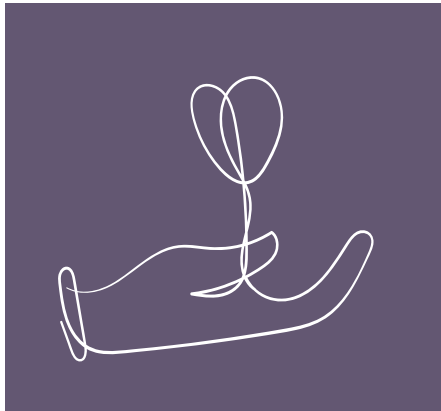
Learn more about Lee Ross, and watch his 2019 interview in Inside the Psychologist's Studio, at psychologicalscience.org/lee-ross-tribute.

References

Berkman, E. T., & Wilson, S. M. (2021). So useful as a good theory? The practicality crisis in (social) psychological theory. *Perspectives on Psychological Science*. Advance online publication. https://doi.org/10.1177/1745691620969650

Ellsworth, P. C. (2021). Truth and advocacy: Reducing bias in policy-related research. *Perspectives on Psychological Science*. Advance online publication. https://doi.org/10.1177/1745691620959832

Grzanka, P. R., & Cole, E. R. (2021). An argument for bad psychology: Disciplinary disruption, public engagement, and social transformation. *American Psychologist*, *76*. Advance online publication. https://doi.org/10.1037/amp0000853

Hoffman, A. J. (2021). *The engaged scholar: Expanding the impact of academic research in today's world*. Stanford University Press.

Ledgerwood, A., Pickett, C., Navarro, D., Remedios, J. D., & Lewis, N. A., Jr. (in press). The unbearable limitations of solo science: Team science as a path for more rigorous and relevant research. *Behavioral and Brain Sciences*.

Lewis, N. A., Jr., & Wai, J. (2021). Communicating what we know, and what isn't so: Science communication in psychology. *Perspectives on Psychological Science*. Advance online publication. https://doi.org/10.1177/1745691620964062

Murphy, M. C., Mejia, A. F., Mejia, J., Yan, X., Cheryan, S., Dasgupta, N., Destin, M., Fryberg, S. A., Garcia, J. A., Haines, E. L., Harackiewicz, J. M., Ledgerwood, A., Moss-Racusin, C. A., Park, L. E., Perry, S. P., Ratliff, K. A., Rattan, A., Sanchez, D. T., Savani, K., . . . Pestilli, F. (2020). Open science, communal culture, and women's participation in the movement to improve science. *Proceedings of the National Academy of Sciences*, *117*(39), 24154–24164. https://doi.org/10.1073/pnas.1921320117

Festinger, L., Riecken, H. W., & Schachter, S. (1956). *When prophecy fails: A social and psychological study of a modern group that predicted the destruction of the world*. Harper-Torchbooks.

Roberts, S. O., Bareket-Shavit, C., Dollins, F. A., Goldie, P. D., & Mortenson, E. (2020). Racial inequality in psychological research: Trends of the past and recommendations for the future. *Perspectives on Psychological Science*, *15*(6), 1295–1309. https://doi.org/10.1177/1745691620927709

Ross, L. (2021). *Dissonance theory redux: Reuniting Leon and Lewin* [Unpublished manuscript]. Department of Psychology, Stanford University.

Salter, P., & Adams, G. (2013). Toward a critical race psychology. *Social and Personality Psychology Compass*, *7*(11), 781–793. https://doi.org/10.1111/spc3.12068

Voigt, R., Camp, N. P., Prabhakaran, V., Hamilton, W. L., Hetey, R. C., Griffiths, C. M., Jurgens, D., Jurafsky, D, & Eberhardt, J. L. (2017). Language from police body camera footage shows racial disparities in officer respect. *Proceedings of the National Academy of Sciences*, *114*(25), 6521–6526. https://doi.org/10.1073/pnas.1702413114

REQUEST FOR PROPOSALS

Advanced Training in Mathematical and Computational Modeling for Psychological Science

Sponsored by the William K. and Katherine W. Estes Fund

aps
ASSOCIATION FOR
PSYCHOLOGICAL SCIENCE

PSYCHONOMIC SOCIETY

Initial Proposal Deadline **September 1, 2021**	Full Proposal Deadline **December 1, 2021**

The William K. and Katherine W. Estes Fund invites proposals to fund advanced training opportunities in mathematical and computational modeling for psychological science in summer schools or focused workshops.

Potential proposers are encouraged to contact members of the Estes Fund Committee during the initial proposal preparation process.

The Association for Psychological Science and the Psychonomic Society are committed to scientific merit, which entails the inclusion of scientists of all genders, races, sexual orientations, countries of origin, geographical locations, and disciplinary expertise.

ESTES FUND COMMITTEE

Alice Healy (Chair), *University of Colorado Boulder*, **alice.healy@colorado.edu**

Elizabeth Ligon Bjork, *University of California, Los Angeles*, **elbjork@psych.ucla.edu**

Morton Ann Gernsbacher, *University of Wisconsin-Madison*, **magernsb@wisc.edu**

Mike Jones, *Indiana University*, **jonesmn@indiana.edu**

Richard Shiffrin, *Indiana University*, **shiffrin@indiana.edu**

For more information on the Estes Fund visit

WWW.PSYCHOLOGICALSCIENCE.ORG/ESTES-FUND

Dogs Mentally Represent Jealousy-Inducing Social Interactions

Amalia P. M. Bastos, Patrick D. Neilands, Rebecca S. Hassall, Byung C. Lim, and Alex H. Taylor

Dogs can experience and show jealousy, this research suggests. Dogs observed a realistic-looking fake dog positioned next to their owner, after which the researchers positioned a barrier to prevent each dog from seeing its owner and the fake dog. Although the barrier blocked their line of sight, the dogs forcefully attempted to reach their owners when they appeared to interact with the fake dogs. This reaction did not occur when the fake dog was replaced by a fleece cylinder. Thus, dogs showed human like signatures of jealous behavior: Jealousy emerged only when their owner interacted with a social rival and as a consequence of that interaction, even when the interaction was out of sight.

Psychological Science
https://doi.org/10.1177/0956797620979149

PSYCHOLOGICAL SCIENCE

Using Body Ownership to Modulate the Motor System in Stroke Patients

Riccardo Tambone et al.

Illusory body ownership (e.g., of an avatar) might help to promote motor recovery in stroke patients. Patients with chronic motor deficits completed an immersive virtual reality training (three sessions each week for 11 weeks) in which they had either a first-person or a third-person perspective of an avatar that walked around the virtual environment. After the training, only the patients who had had a first-person perspective (i.e., experienced body ownership) improved gait and balance. Tambone and colleagues suggest that representing a virtual body as their own allowed patients to access motor functioning and promoted motor recovery.

https://doi.org/10.1177/0956797620975774

Harder Than You Think: How Outside Assistance Leads to Overconfidence

Matthew Fisher and Daniel M. Oppenheimer

Fisher and Oppenheimer explored when and why people are unaware of their reliance on outside assistance and how to reduce the resulting overconfidence (e.g., using Google to look up facts and subsequently overestimating one's own knowledge). Across eight experiments, the researchers found that people recognized the extent of their knowledge (i.e., had better metacognitive calibration) when outside assistance was given only after they had first had a chance to provide an answer (i.e., after a delay) or when they had to actively choose to receive assistance.

https://doi.org/10.1177/0956797620975779

How Long Does It Take for a Voice to Become Familiar? Speech Intelligibility and Voice Recognition Are Differentially Sensitive to Voice Training

Emma Holmes, Grace To, and Ingrid S. Johnsrude

To investigate how voice familiarity develops, Holmes and colleagues exposed participants to three novel voices for different lengths of time (from 10 to 60 min) and tested how recognizable and intelligible those voices became. When compared with two unheard voices, the previously heard voices were more recognizable and intelligible. The longest exposures increased intelligibility but not recognizability. Exposure of about 60 min (478 sentences) resulted in a speech-intelligibility benefit as large as the benefit reported in previous

research involving very familiar voices (friends and spouses). Thus, just 1 hour of training can create voice familiarity and accompanying higher intelligibility.

https://doi.org/10.1177/0956797621991137

Massive Effects of Saliency on Information Processing in Visual Working Memory

Martin Constant and Heinrich R. Liesefeld

Constant and Liesefeld developed a novel visual working memory (VWM) task to test whether VWM processing depends on an object's saliency (i.e., how much it stands out). This task disentangles an object's saliency from the discriminability of its to-be-remembered features (in this case, color), allowing for a direct manipulation of saliency. In three experiments, participants appeared to prefer processing the most salient objects within a scene. How well the objects were processed appeared to depend on both the objects' relative saliency (compared with objects presented at the same time) and absolute saliency (how much they stood out).

https://doi.org/10.1177/0956797620975785

Feelings of Culpability: Just Following Orders Versus Making the Decision Oneself

Maayan S. Malter, Sonia S. Kim, and Janet Metcalfe

In several experiments, participants imagined themselves either as programmers of self-driving cars or as mayors during the COVID-19 pandemic. In response to moral dilemmas related to these situations, they then had to either 1) make decisions themselves about what to do or 2) do what a superior ordered. Finally, they were informed of a tragic outcome that occurred because of their decision and asked how culpable they felt. Results were contrary to the researchers' expectations, showing that participants who followed orders felt more culpable than those who had

made their decisions by themselves. The researchers discuss possible reasons for this result.

https://doi.org/10.1177/09567976211002821

Recoiling From Threat: Anxiety Is Related to Heightened Suppression of Threat, Not Increased Attention to Threat

Emily S. Kappenman, Raphael Geddert, Jaclyn L. Farrens, John J. McDonald, and Greg Hajcak

Kappenman and colleagues measured brain event-related potentials (ERPs) to disentangle attentional selection and suppression of threatening images (e.g., weapons, snakes) and conditioned threats (colored shapes paired with electric shocks). In a sample of young adults, both threat types increased attentional selection, but only the conditioned threats elicited subsequent suppression. Trait anxiety was not related to attentional selection, but increased anxiety was associated with greater suppression of conditioned threats. These findings suggest that individuals with more anxiety, compared with those with less anxiety, do not pay more attention to threats but more often suppress those threats.

https://doi.org/10.1177/2167702620961074

Emotion Regulation Diversity in Current and Remitted Depression

Alainna Wen, Leanne Quigley, K. Lira Yoon, and Keith S. Dobson

Emotion regulation (ER) diversity may have an important role in depression, this research suggests. Wen and colleagues created the ER diversity index on the basis of how three groups of participants—currently depressed, remitted depressed, and healthy—rated their use of emotion regulation strategies (e.g., self-blame, acceptance). The ER diversity index was more associated with depres-

sion status than other ER measures, such as a flexibility score. Compared with healthy individuals, currently and remitted depressed individuals showed more diversity in overall and maladaptive ER strategies (e.g., catastrophizing) but less diversity in adaptive ER strategies (e.g., putting things into perspective).

https://doi.org/10.1177/2167702620978616

Emotional and Cognitive Empathy in Caregivers of People With Neurodegenerative Disease: Relationships With Caregiver Mental Health

Alice Y. Hua, Jenna L. Wells, Casey L. Brown, and Robert W. Levenson

Caregivers of people with dementia or neurodegenerative disease who show high levels of emotional empathy appear to have poorer mental health than those with lower empathy levels. In a sample of caregivers of people with dementia or neurodegenerative disease, Hua and colleagues measured mental health, emotional empathy (by registering physiological, behavioral, and emotional responses to a film depicting other people's suffering), and cognitive empathy (by registering how accurately participants identified other people's emotions). Higher emotional empathy, but not cognitive empathy, appeared to be associated with worse mental health, suggesting that emotional empathy might be a risk factor and an intervention target.

https://doi.org/10.1177/2167702620974368

The Call of the Wild: How Extremism Happens

Arie W. Kruglanski, Ewa Szumowska, and Catalina Kopetz

Kruglanski and colleagues propose that all cases of extremism (e.g., violent extremism, extreme humanism, workaholism, or extreme ath- ➡

leticism) involve the same psychological mechanism: a motivational imbalance wherein a specific need becomes so dominant that it overrides other concerns and unleashes behaviors that the other concerns used to constrain. According to this view, cases of negative and antisocial extremism, as well as cases of positive and prosocial extremism, are rooted in the imbalance of needs. The authors believe that understanding the mechanisms that promote motivational imbalance may help to prevent extremism and its possible negative consequences.

https://doi.org/10.1177/0963721421992067

Rethinking the Diagnosis of Mental Disorders: Data-Driven Psychological Dimensions, Not Categories, as a Framework for Mental-Health Research, Treatment, and Training

Christopher C. Conway, Robert F. Krueger, and HiTOP Consortium Executive Board

Conway and colleagues discuss an alternative to the use of categories to describe mental health. The Hierarchical Taxonomy of Psychopathology (HiTOP) deconstructs diagnostic categories and replaces them with the use of dimensions. Rethinking mental health as hierarchical dimensions, with broad and specific components, can help to explain a) why individual differences in mental health are a matter of degree, and b) how broad mental-health conditions (e.g., internalizing) can account for the tendency of more specific conditions to co-occur (e.g., depression, anxiety). The researchers review recent findings supporting the adoption of HiTOP as a framework for research, treatment, and training.

https://doi.org/10.1177/0963721421990353

See all APS journals at psychologicalscience.org/publications

The Psychological Reach of Culture in Animals' Lives
Andrew Whiten

Recent findings suggest that cumulative buildup of culture across generations is more common in animals than researchers previously thought. Culture in diverse species appears to expand to several behaviors and throughout an animal's life. Animals not only show socially learned traditions acquired in a community but also display the cumulative cultural change over generations that has led to complex cultural phenomena observed in humans. For example, a bumblebee was trained to pull a nectar-laden flower, other bees from the hive observed this and began to adopt the technique, which subsequently spread to many other hive members. This cumulative cultural change, although not nearly as elaborate as in humans, can result in cross-generation progress.

https://doi.org/10.1177/0963721421993119

PERSPECTIVES ON PSYCHOLOGICAL SCIENCE

Sorting the File Drawer: A Typology for Describing Unpublished Studies
David A. Lishner

Lishner describes various types of unpublished studies and reasons for their nonpublication, categorized as either result-dependent or result-independent. He also reports whether the different types of reasons for nonpublication have a greater effect on individual researchers' decisions to submit (or not to submit) or on reviewers/editors' decisions to not accept a study. He argues that result-dependent reasons are more likely to introduce publication bias than result-independent reasons. Lishner describes some reasons for nonpublication (e.g., poor methodology) that would produce beneficial (i.e., rigor bias) rather than problematic publication bias. The typology he proposes may facilitate understanding the universe of

study results within subdisciplines of psychological science.

https://doi.org/10.1177/1745691620979831

Do We Report the Information That Is Necessary to Give Psychology Away? A Scoping Review of the Psychological Intervention Literature 2000–2018
Bharathy Premachandra and Neil A. Lewis, Jr.

Articles about psychological interventions appear to not report all of the information needed to implement interventions. Premachandra and Lewis present this conclusion after conducting a scoping review (i.e., a descriptive overview of the articles as a whole rather than the individual studies) of the psychological-intervention literature published between 2000 and 2018. The researchers found that the 56 studies reviewed report, at most, 64% of the information needed to implement interventions. This indicates a gap between the information reported and the information practitioners need to implement findings.

https://doi.org/10.1177/1745691620974774

Gender Nonconformity and Minority Stress Among Lesbian, Gay, and Bisexual Individuals: A Meta-Analytic Review
Brian C. Thoma, Kristen L. Eckstrand, Gerald T. Montano, Taylor L. Rezeppa, and Michael P. Marshal

Gender nonconformity appears to be associated with minority stress experiences (i.e., stress in social environments in the form of prejudice based on sexual orientation) among lesbian, gay, and bisexual (LGB) individuals. Thoma and colleagues examined studies and found that gender nonconformity among LGB individuals appeared to be associated with experiencing more prejudice,

less concealment of sexual orientation, lower internalized homonegativity, and higher expectations of rejection related to sexual orientation. Moreover, gender nonconformity among men appeared more associated with experiencing prejudice than among women. These findings suggest that researchers should further examine gender nonconformity when studying the role of minority stress in health outcomes among LGB individuals.

https://doi.org/10.1177/1745691620968766

ADVANCES IN METHODS AND PRACTICES IN PSYCHOLOGICAL SCIENCE

Improving Transparency, Falsifiability, and Rigor by Making Hypothesis Tests Machine-Readable
Daniël Lakens and Lisa M. DeBruine

Lakens and DeBruine propose an approach to make hypothesis tests machine-readable. Specifying hypothesis tests in ways that a computer can read and evaluate might increase the rigor and transparency of hypothesis testing as well as facilitate finding and reusing these tests and their results (e.g., in meta-analyses). The authors describe what a machine-readable hypothesis test should look like and demonstrate its feasibility in a real-life example (DeBruine's 2002 study on facial resemblance and trust), using the prototype R package scienceverse.

https://doi.org/10.1177/2515245920970949

An Excess of Positive Results: Comparing the Standard Psychology Literature With Registered Reports
Anne M. Scheel, Mitchell R. M. J. Schijen, and Daniël Lakens

When the only results published are those that support the tested hypotheses (i.e., "positive" results), evidence for scientific claims is distorted.

Putting the Self in Self-Correction: Findings From the Loss-of-Confidence Project
Julia M. Rohrer et al.

Rohrer and researchers from diverse fields of psychology explore the "self" in science's self-correction process. In 13 statements, researchers share how and why they have lost confidence in one of their own published findings. The authors discuss these loss-of-confidence statements and extract the common reasons for the loss of confidence. They also report the results of an anonymous survey indicating that loss-of-confidence sentiments are common but rarely made public. Rohrer and colleagues argue that removing barriers to individual self-correction is key to making psychological science the self-correcting enterprise that science more broadly is perceived to be.

Perspectives on Psychological Science
https://doi.org/10.1177/1745691620964106
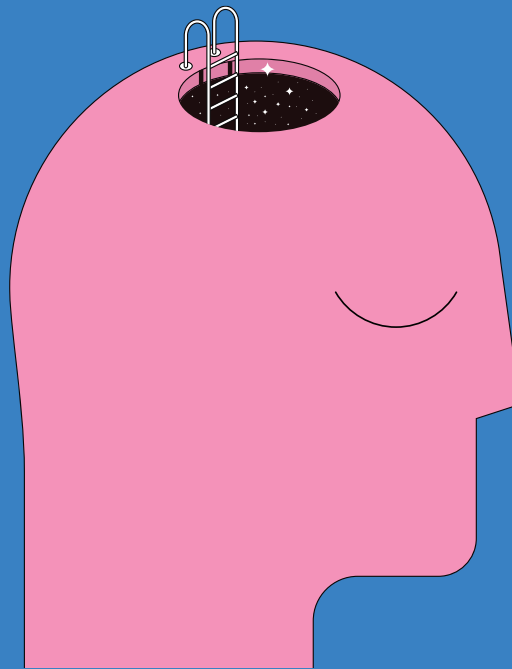
Scheel and colleagues compared the results published in Registered Reports (RRs)—a new publication format in which authors commit to peer review and publishing before the results are known—with a random sample of results reported in standard publications. They found that 44% of results in RRs are positive, compared with 96% in standard publications. Scheel and colleagues suggest that there might be reduced publication bias and/or inflation of Type I error (i.e., rejection of a true null hypothesis) in RRs. ⊙

https://doi.org/10.1177/25152459211007467

FOR MARGINALIZED GRAD STUDENTS, A GUIDE TO THE "HIDDEN CURRICULUM"

Silence, it is said, often speaks volumes. Similarly, the "hidden curriculum" of graduate school—from knowing where to apply to finding mentors to conquering grant writing—is almost palpably evident to many young scholars marginalized by race, ethnicity, or other factors. How can you excel academically and emotionally when you can't even find the curriculum?

To make matters worse, "there's no handbook for how to process that people who look like you continue to be killed every day—and then [to have to] show up for research meetings, therapy sessions with clients, and class and having to act like nothing happened," said Déjà N. Clement, a PhD student in clinical psychology at Oklahoma State University. "We have been navigating the ivory tower despite not seeing people who look like us. Psychology and psychological science have an incredibly long way to go to reach equity for marginalized scholars."

Clement and five other women discussed these and additional challenges facing racially marginalized graduate students in a recent APS webinar about DiSSECT (Dismantling Systemic Shortcomings in Education and Clinical Training), an innovative effort to facilitate antiracist progress in graduate education. DiSSECT is a national organization led by graduate students striving to advance antiracist initiatives in clinical psychology and related graduate training programs by increasing access to resources and highlighting BIPOC (Black, Indigenous, and people of color) perspectives. The panelists discussed one of the resources in development, the Marginalized Graduate Student Survival Kit, which is designed to help graduate students with racially marginalized identities successfully navigate graduate training and academia.

See a recording of this webinar, along with other APS webinars, at psychologicalscience.org/webinars.
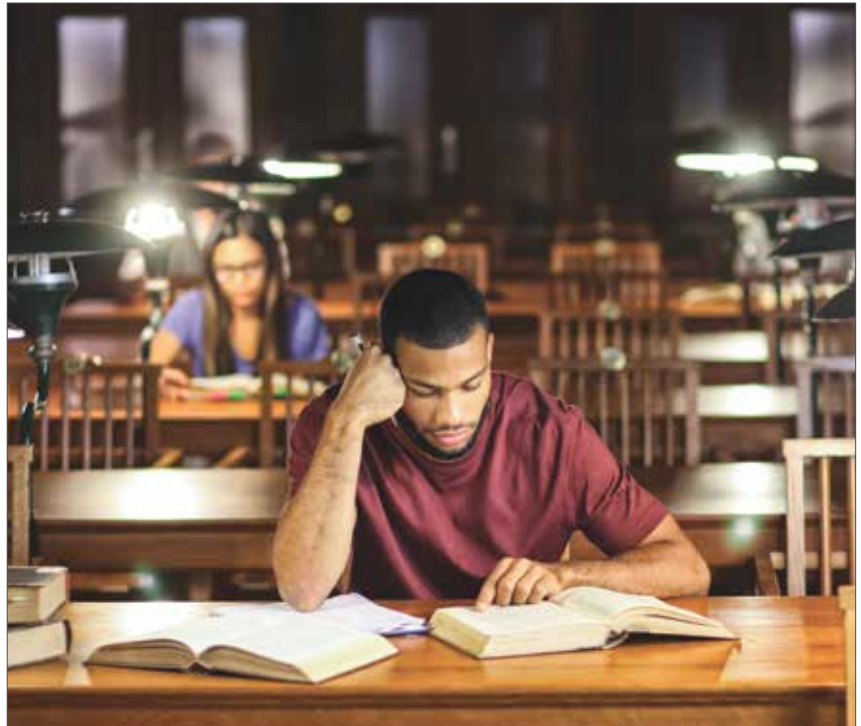
Launched last summer with the help of an APS microgrant, DiSSECT was inspired in part by the police shootings of George Floyd, Breonna Taylor, and Ahmaud Arbery, said Clement.

"Essentially, our goal is to help facilitate systemic change in clinical psychology and related training programs by creating, compiling, and disseminating antiracism-related open-access resources to help programs enact necessary changes as seamlessly as possible," said Jaisal T. Merchant, a graduate student in clinical psychology at Washington University in St. Louis, in the webinar. "We hope to do this while amplifying the voices of those BIPOC researchers and advocates who have been doing this work, most of whom have been doing so long before we started with DiSSECT."

Ariana Rivens, a doctoral student in clinical psychology at the University of Virginia, elaborated on the purpose of the toolkit.

"We seek to make the hidden curriculum visible and challenge it to transform to be equitable and transparent," she said. "In short, we want racial and ethnically marginalized students to have this kit as an additional resource—not the only one."

DiSSECT is still under development, but you can get involved by emailing the team at dissect.team@gmail.com, completing the DiSSECT Involvement Survey, following DiSSECT on Twitter (@dissect_), or accessing this growing list of resources in the survival kit, including websites, podcasts, mentorships, funding opportunities, and more. ●

LISTENING TO MUSIC NEAR BEDTIME COULD LURE SLEEP-DISRUPTING 'EARWORMS'

Most people have had a song stuck in their heads at one time or another. These persistent melodies, commonly called earworms, can be amusing distractions or intrusive annoyances.

New research published in the journal *Psychological Science*, however, reveals that earworms can sometimes interject themselves into our dreams, where they can negatively impact our quality of sleep.

"Our brains continue to process music even when none is playing, including apparently while we are asleep," said Michael Scullin, a sleep researcher at Baylor University and lead author on the article. "Everyone knows that music listening feels good. Adolescents and young adults routinely listen to music near bedtime. But sometimes you can have too much of a good thing."

According to the researchers, people who experience earworms regularly at night—one or more times per week—are six times more likely to have poor sleep quality compared to people who rarely experience earworms. Surprisingly, the study, which involved both a survey and a laboratory experiment, found that some instrumental music is more likely to lead to earworms and disrupt sleep quality than lyrical music.

The survey involved 209 participants who completed a series of questionnaires on sleep quality, music listening habits, and earworm frequency, including how often they experienced an earworm while trying to fall asleep, waking up in the middle of the night, and immediately upon waking in the morning.

In the experimental study, 50 participants were brought into Scullin's Sleep Neuroscience and Cognition Laboratory at Baylor, where the research team attempted to induce earworms to determine how it affected sleep quality. Polysomnography—a comprehensive test and the gold standard measurement for sleep—was used to record the participants' brain waves, heart rate, breathing, and more while they slept.

"Before bedtime, we played three popular and catchy songs—Taylor Swift's 'Shake It Off,' Carly Rae Jepsen's 'Call Me Maybe,' and Journey's 'Don't Stop Believin',"" Scullin said. "We randomly assigned participants to listen to the original versions of those songs or the de-lyricized instrumental versions of the songs."

Additionally, the researchers took EEG readings—records of electrical activity in the brain—to examine physiological markers of sleep-dependent memory consolidation. Memory consolidation is the process by which temporary memories are spontaneously reactivated during sleep and transformed into a more long-term form.

Participants who had a sleep earworm showed more slow oscillations during sleep, a marker of memory reactivation. The increase in slow oscillations was dominant over the region corresponding to the primary auditory cortex, which is implicated in earworm processing when people are awake.

"Almost everyone thought music improves their sleep, but we found those who listened to more music slept worse," Scullin said. "What was really surprising was that instrumental music led to worse sleep quality—instrumental music leads to about twice as many earworms." ◉

See the full article online with references—and listen to Under the Cortex *podcast coverage—at* psychologicalscience.org/observer/ear-worm.

¡HOLA! CÓMO ESTÁS? SPEAKING SPANISH MAY PROTECT YOUR HEART

Some 30 years ago, researchers found that Hispanic individuals are less likely to die from heart disease than their non-Hispanic White counterparts, despite having higher risk factors—a pattern they dubbed the "Hispanic paradox." New research in *Perspectives on Psychological Science* suggests that cultural characteristics affecting how Spanish speakers appraise and accumulate stress might explain this paradox.

Compared to English, writes María Magdalena Llabre (University of Miami), the Spanish language has specific characteristics that might minimize the impact of negative mood and experiences on cardiovascular responses, and thus protect Spanish-speaking individuals from the effects of stress.

"Healthy" language features

The Spanish language has several features, shared with other Romance languages, that foster the use of a wider range of emotions in common speech than English does.

Unlike English speakers, Spanish speakers can specify the **permanence of emotions**. This is because the verb "to be" has two forms in Spanish: the trait (permanent) *ser* and the state (transitory) *estar* (e.g., "I am sad" can be *soy triste* or *estoy triste*, respectively). This distinction affects the representation of emotions, situations, conditions, and characteristics. For example, Spanish speakers can choose to say *estoy gordo* instead of *soy gordo* for "I am fat." This can lead to a different appraisal of the situation that includes the possibility for change.

Spanish appears to **promote the use of "happy" words** because it has a larger lexicon for positive affect than English. This availability of positive words might

encourage optimism. More broadly, Spanish has a **larger emotional lexicon**, which allows for more heterogeneity in the emotions articulated by Spanish speakers compared to English speakers. In difficult circumstances, the ability to express varied emotions has been linked to improved psychological and physical health.

Spanish speakers can **exaggerate or minimize emotion words by using suffixes**. The addition of suffixes such as *-ísimo* or *-ísima* can maximize an emotion (e.g., *tristísimo* is very sad), whereas suffixes such as *-ito* or *-ita* can minimize an emotion—and possibly diminish the magnitude of a stressor (e.g., *cansadito* as a little tired).

Greater use of the subjunctive mood, which can add information about possibilities, contextual factors, or emotions to the infinitive form of any verb (e.g., *Me alegro de que seas mi amigo* for "I am happy that you are

my friend"). Spanish speakers' more frequent use of the subjunctive mood means they have more opportunities to explore alternative or hypothetical possibilities or convey their attitude toward events or actions.

By providing wider access to emotion words, creating the potential for more optimism, and enhancing social relations, all of these features of Spanish may influence how individuals build emotion schemas and appraise stress. Ultimately, those effects of language may influence cardiovascular reactivity and recovery.

"Whether language reflects a culture's view of emotion or influences that view may be impossible to parse. The effects are likely reciprocal and evolved over time," Llabre wrote. •

View this article with references at psychologicalscience.org/hispanic-paradox.

PURSUING BEST PRACTICES IN STEM EDUCATION: THE PERIL AND PROMISE OF ACTIVE LEARNING

The need for quality STEM (science, technology, engineering, and math) education has never been greater, but educators face lingering questions about how students most effectively learn these subjects. Although a promising instructional technique known as "active learning" has become more pervasive in undergraduate STEM education, this approach to education is ill-defined and the characteristics of effective active learning remain elusive.

In the latest issue of *Psychological Science in the Public Interest,* teams of researchers across many disciplines synthesized recent findings on STEM learning to provide a focused description of active learning and offer guidance on current practice and future research.

"Because of the vagaries of the term 'active learning,' my colleagues and I wanted to provide a coherent and actionable concept of active learning that incorporates a wide array of research disciplines," said first author Doug Lombardi (University of Maryland, College Park).

What is active learning?

Many educators have suggested that active-learning strategies, which include a variety of hands-on learning techniques and focus on student engagement, are highly effective for undergraduate STEM education. They also appear to provide more equitable outcomes for students from underrepresented groups in STEM fields.

In past research, active learning has commonly been used as a vague umbrella term to represent an alternative to the traditional lecture in which students sit passively and listen to their instructor while taking notes.

Multiple activities have been described as active learning, including participation in flipped classrooms (in which students read or watch educational material outside of class and use class time to engage in interactive activities), use of clickers or other student response systems, and engagement with computerized conversational agents.

The authors approached this study with several questions in mind: What are effective learning processes in undergraduate STEM, and what role does active learning play in these processes? Do certain active-learning strategies optimize learning in some situations but not others? Is lecturing—the predominant teaching strategy in undergraduate STEM instruction—inherently flawed, or are there some circumstances in which students can actively learn during lectures?

Outcomes and goals

The authors hope that their new report will transcend traditional academic silos by encouraging cross-disciplinary science involving researchers from educational and cognitive psychology and education in several STEM fields.

Lombardi and his coauthors present a framework for active learning that they believe will be a useful tool for researchers and instructors who want to deepen students' STEM learning. If future research can help educators better understand how to increase students' agency during the instructional process, it will open STEM to more students, particularly those who have been disempowered and underrepresented via traditional modes of instruction.

"The cornerstone of this work is the idea that learners should be active agents during instruction to optimize inclusive and effective learning of complex STEM topics and practices," Lombardi said. ●

aps

2021 VIRTUAL CONVENTION
MAY 26-27, 2021

The 2021 APS Virtual Convention brought together psychological scientists from around the world for two days of premier research and networking. And don't forget - the Virtual Poster Showcase is available to meeting attendees until September 1 at psychologicalscience.org/convention.

As we prepare for APS 2022 in Chicago, IL, we are taking one last look at APS 2021 by the numbers.

2021 APS Virtual Convention Presentations

1858 Posters Presented

8 Student Caucus Award Winners Recognized

2 Convention Podcast Episodes

503 Flash Talks

65 Sessions

2,147 Live Chat Messages Posted

200+ Hours of Recorded Content

4 Keynote Sessions

22 APS Award Winners Recognized

2021 APS Virtual Convention Attendees

3200+ Attendees

Attendees from 60+ Countries

2% Retired Members

44% Members

54% Student Affiliates

Attendees

Attendees by Primary Major Field

- 1% Cultural
- 2% Quantitative
- 3% Applied
- 4% Educational
- 5% Experimental
- 5% Industrial/Organizational
- 5% Biological/Neuroscience
- 10% Developmental
- 13% General
- 13% Cognitive
- 18% Personality/Social
- 23% Clinical Science

0   5   10   15   20   25

THANK YOU TO OUR EXHIBITORS AND SPONSORS

SAGE Publishing

EWING MARION KAUFFMAN FOUNDATION

THE KAVLI FOUNDATION

American Psychological Association

CAMBRIDGE UNIVERSITY PRESS

CloudResearch

Journal of Intelligence
an Open Access Journal by MDPI

movisens

Prolific

PSYCHONOMIC SOCIETY

SPSP
Society for Personality and Social Psychology

SPRINGER NATURE

Taylor & Francis
an informa business

worth publishers
Macmillan Learning

NEW RESEARCH HIGHLIGHTS WHITE AUDIENCE ASSOCIATIONS OF 'BLACK' AND 'AFRICAN AMERICAN' LABELS

A new series of studies to be published by *Psychological Science* show that White Americans associate the label "Blacks" with being targets of racial bias more than the label "African Americans." The findings have implications for outcomes as varied as image search results, the tone of media coverage, and non-profit fundraising.

In one particularly stark finding, White Americans wanting to eradicate racial injustice will donate more to non-profit organizations describing themselves as Black compared to African American.

The paper, titled "What's in a name? The hidden historical ideologies embedded in the Black and African American racial labels," is coauthored by professors Erika V. Hall of Emory University's Goizueta Business School, Sarah S. M. Townsend of the USC Marshall School of Business, and doctoral student James T. Carter of Columbia Business School.

"Americans of African Descent have long fought for equality. But White Americans often misunderstand or misrepresent their advocacy," said Hall. "We show the use of the Black versus African American label may fundamentally alter White Americans' perceptions of their intentions."

The studies explore the association between the African American and Black labels and the ideologies of the historical movements within which they gained prominence.

"Specifically, because the Black label became prominent amidst the Black Power Movement in the 1960s and the African American label gained popularity amidst the late Civil Rights Movement in the 1980s, people and organizations that use each term are perceived to embody the ideologies of those

movements," explained Townsend.

The authors argue that this means the African American label is associated with voting rights and political participation, and the Black label is associated with racial victimization and degradation. The authors find that the use of one or another label skews the results of Google image searches and the content of editorials in media. Use of the Black label leads to more racially victimized imagery, while use of the African American label leads to more civil rights and inequality imagery.

Critically, this research also shows that use of these labels in any media can substantially influence White audiences' financial support of the causes they advocate.

"It is possible that our findings may only generalize to groups that are *not* of African descent. Americans of African descent may be unlikely to apply

ideological stereotypes to people and organizations labeled by these terms," said Carter.

"Thus, seemingly small changes in labels can make a big difference," said Hall. "Although activists and journalists may not be aware of the ideologies embedded these labels, they must carefully choose which one to use: either Black or African American."

The authors' advice is to allow a person or organization to self-label in the way that most closely reflects their identity.

"Of course, our studies also represent a snapshot of a particular time," said Townsend. "The meaning of these words may shift with highly visible race-based events." ●

View this article with references at psychologicalscience.org/african-american-labels.

TODDLER TV TIME NOT TO BLAME FOR ATTENTION PROBLEMS

A comprehensive review published in the journal *Psychological Science* re-examines previous work that claimed to show a direct link between early screen time and attention problems in children. Although other studies do not reflect these findings, the earlier research continues to be widely reported by the media.

"The findings from the original study, upon further scrutiny, are not borne out. We found that there is still no evidence that TV, by itself, causes ADHD or any kind of attention problems in young children," said Wallace E. Dixon, Jr., a professor of psychology and department head at East Tennessee State University and coauthor of the study. "Our research

also tells us that it's important to be skeptical of earth-shattering findings that come in the form of 'something that everybody is doing harms our children.' Extraordinary claims require extraordinary evidence.

"What excites us about the research is that we can ease up on blaming parents or making them feel guilty for letting their children watch television when they are very young," said Dixon.

The newly reported research involved looking at the same data as the 2004 study and using multiverse analyses—a technique that involves asking a research question hundreds of different ways to determine if the answers are similar each time. This

method was used to create 848 analyses to find out if early TV viewing causes later attention problems. A vast majority of results showed no link between the two. The few that did, the authors believe, reflect some oddities in the data set that are not likely to represent the real world. ●

Reference

McBee, M. T., Brand, R. J., & Dixon, W. E., Jr. (2021). Challenging the link between early childhood television exposure and later attention problems: A multiverse approach. *Psychological Science*. Advance online publication.

LITTLE TO NO LINK BETWEEN ADOLESCENTS' MENTAL HEALTH PROBLEMS AND DIGITAL TECHNOLOGY USE

With the explosion in digital entertainment options over the past several decades and the more recent restrictions on outdoor and in-person social activities, parents may worry that excessive engagement with digital technology could have long-term effects on their children's mental health.

A new study published in the journal *Clinical Psychological Science*, however, found little evidence for an increased association between adolescents' technology engagement and mental health problems over the past 30 years. The data did not consistently support the suggestion that the technologies we worry about most (e.g., smartphones) are becoming more harmful.

The new study, which included 430,000 U.K. and U.S. adolescents, investigated the links between social media use and depression, emotional problems, and conduct problems. It also examined the associations between television viewing and suicidality, depression, emotional problems, and conduct problems. Finally, the study explored the association between digital device use and suicidality.

Of the eight associations examined in this research, only three showed some change over time. Social media use and television viewing became less strongly associated with depression. In contrast, social media's association with emotional problems did increase, although only slightly. The study found no consistent changes in technology engagement's associations with conduct problems or suicidality.

"If we want to understand the relationship between tech and well-being today, we need to first go back and look at historic data—as far back as when parents were concerned too much TV would give their kids square eyes—in order to bring the contemporary concerns we have about newer technologies into focus," said Matti Vuorre, a postdoctoral researcher at the Oxford Internet Institute and lead author on the paper.

The study also highlighted key factors preventing scientists from conclusively determining how technology use relates to mental health.

"As more data accumulates on adolescents' use of emerging technologies, our knowledge of them and their effects on mental health will become more precise," said Andrew Przybylski, director of research at Oxford Internet Institute and senior author on the study. "So, it's too soon to draw firm conclusions about the increasing, or declining, associations between social media and adolescent mental health, and it is certainly way too soon to be making policy or regulation on this basis.

"We need more transparent and credible collaborations between scientists and technology companies to unlock the answers. The data exists within the tech industry; scientists just need to be able to access it for neutral and independent investigation," Przybylski said. ●

Reference

Vuorre, M., Orben, A., & Przybylski, A. (2021). There is no evidence that associations between adolescents' digital technology engagement and mental health problems have increased. *Clinical Psychological Science*. Advance online publication.

Call for Applications

APS Teaching Fund
Small Grants Program

APS invites applications for nonrenewable grants up to $5,000 to launch new projects broadly addressing the categories below:

- Scholarship of Teaching and Learning (SoTL): Grants in this category support high-quality, potentially publishable scholarship directed at the teaching and learning of psychological science.

- Meetings and Conferences: Grants in this category support efforts that facilitate communication among teachers of psychological science who share common challenges and who would benefit from sharing ideas and resources.

- Technology and Websites: Grants in this category support projects leveraging technological resources to enhance the teaching and learning of psychological science, and to increase the reach and efficient dissemination of related resources.

- Antiracist Curricula: Grants in this category support projects that aim to eliminate racial bias in psychological science curricula and incorporate principles of racial justice into the teaching of psychological science content.

NEXT APPLICATION DEADLINE: OCTOBER 1, 2021

For details, go to **www.psychologicalscience.org/smallgrants**
Questions? Contact **teachfund@psychologicalscience.org**

aps
ASSOCIATION FOR
PSYCHOLOGICAL SCIENCE

EXPERT PANEL: POLICING AND RACISM, INSIGHTS FROM PSYCHOLOGICAL SCIENCE

On May 21, APS convened a panel of experts on policing and racism to discuss the latest scientific data and share insights into the factors behind racial bias during police encounters. Journalists were invited to attend this one-hour online presentation.

Policing Racial Bias was presented by APS President Jennifer L. Eberhardt, a professor of psychology and co-director of Social Psychological Answers to Real-World Questions, or SPARQ, at Stanford University. She described studies relevant to racial bias in the criminal justice system and offered an approach forward, highlighting examples of her work in policing. Eberhardt investigates the consequences of the psychological association between race and crime and the extent to which racial imagery and judgments suffuse our culture and society, and in particular shape actions and outcomes within the domain of criminal justice. She is also the author of *Biased: Uncovering the Hidden Prejudice That Shapes What We See, Think, and Do*. See her Presidential Column on page 6 of this issue of the *Observer*.

Asking the Right Questions About Racism in Policing was presented by Phillip Atiba Goff, the co-founder and CEO of the Center for Policing Equity and a professor of African American Studies and Psychology at Yale University. He is a recognized national leader in the science of racial bias and has pioneered scientific experiments that exposed how our minds learn to associate Blackness and crime implicitly—often with deadly consequences.

Implicit Bias Reflects Systemic Racism was presented by APS Fellow Keith Payne, a professor of psychology

and neuroscience at the University of North Carolina at Chapel Hill. His lab studies how inequality shapes the human mind and explores why people sometimes act in prejudiced ways even when they intend to be fair. He also is author of *The Broken Ladder: How Inequality Affects the Way We Think, Live, and Die*.

Policing and Black America was presented by APS Fellow Tom Tyler, the Macklin Fleming Professor of Law

and a professor of psychology at Yale Law School. His research explores the role of justice in shaping people's relationships with groups, organizations, communities, and societies. In particular, he examines the role of judgments about the justice or injustice of group procedures in shaping legitimacy, compliance, and cooperation. ●

📖 *Watch the panel at* psychologicalscience.org/ expert-panel-policing.

A MAJOR BOOST FOR U.S. SCIENCE RESEARCH?

APS has expressed formal support for critical pieces of the National Science Foundation for the Future Act (H.R. 2225), legislation introduced by the U.S. House of Representatives Committee on Science, Space, & Technology that could dramatically change the size and scope of the U.S. National Science Foundation (NSF).

If passed, the act would be the first comprehensive reauthorization of the NSF since 2010. The bill, led by Representatives Eddie Bernice Johnson (D-TX), Frank Lucas (R-OK), Haley Stevens (D-MI), and Michael Waltz (R-FL), includes strong support for graduate and undergraduate education, broadening participation in STEM, improving reproducibility and replicability, and the development of a new directorate focused on translational research. In its letter to the bill's sponsors, APS voiced enthusiasm for the legislation and highlighted important priorities for psychological and behavioral science.

H.R. 2225 would authorize funding for NSF at up to $10.5 billion USD for the 2022 fiscal year, with an average annual increase of 6% over a five-year period to $13.5 billion. To APS, Congress's interest in NSF and in reinvigorating the science and technology enterprise in the United States is a sign that lawmakers recognize the importance of new investments in scientific research and education. Although the legislation does not provide funding for NSF, it does authorize congressional appropriators to significantly increase the size of annual appropriations to the agency.

The bill proposes an expansion of the Graduate Research Fellowship Program (GRFP), an APS advocacy priority. Currently, each year 2,000 GRFP awards are given; if enacted, the new bill would increase the number of fellows annually to 3,000, enhance their professional development opportunities, and give more money to their universities. The bill also calls on GRFP to recruit a more diverse pool of applicants and would improve undergraduate STEM education and training in line with workforce needs. Other features of the bill include broadening participation and inclusion in STEM awards and scholarships, establishing a pilot program to fund multi-institutional proposals for emerging research institutions, and expanding programs for tribal colleges and universities to support developing and building graduate programs.

The bill supports efforts to enhance reproducibility and replicability in STEM research. Data from NSF-supported projects will be made available in trusted open repositories, and NSF will support developing infrastructure to support research reproducibility. Importantly for psychological science, the bill ensures that NSF's cross-cutting programs include the Social, Behavioral, and Economic Sciences (SBE) Directorate, one of the most important directorates for APS members in its support of psychological and behavioral science research.

In APS's 14 May 2021 letter to the bill's sponsors, APS highlighted how psychological and behavioral science have been key to understanding and encouraging healthy behaviors during the pandemic, addressing racism and bias, and in improving effective communication to combat misinformation spread. Continued support for the SBE directorate will continue to enhance the important research that psychological scientists conduct.

Stay tuned to APS policy news (psychologicalscience.org/tag/get-informed) for further developments on this bill and others. A transformative reauthorization for NSF such as NSF for the Future would be a first step for a larger, broader NSF; it will then fall to Congressional appropriators to ensure that the agency is actually funded at the level envisioned by any new authorization.

Psychological scientists interested in this issue will also want to track similar activity in the Senate. The Endless Frontier Act (S. 1260), sponsored by Senator Chuck Schumer (D-NY) and Senator Todd Young (R-IN), would also increase funding for NSF, with much of the increase going towards a new technology-oriented directorate. This new directorate would focus on 10 key technology areas including semiconductors, artificial intelligence, and biotechnology research. The bill is focused heavily on U.S. competition with other countries. Critics of the bill have questioned the elevation of a Technology Directorate above other NSF programs, as well as its disconnected nature from NSF's structure. Additionally, concerns surrounding duplicating work of other agencies and moving NSF away from its core mission of supporting fundamental research have been noted.

On April 22, APS wrote Schumer and Young to thank them for their focus on enhancing NSF's funding and stature, but also cautioning against fundamentally changing NSF's mission of supporting curiosity-driven research. APS's view is that safeguarding SBE funding is key to supporting psychological and behavioral science research. As this article was going to print for the *Observer* at the end of May 2021, recent Congressional activity had subsumed the Endless Frontier Act under a new piece of legislation called the U.S. Innovation and Competition Act of 2021. APS will provide further updates. ◉

Read APS's letter regarding the NSF for the Future Act here: psychologicalscience.org/nsf-for-the-future-aps.

— **Kekoa Erber**
APS Government Relations Associate

MILLION-DOLLAR MISSED OPPORTUNITIES? TIPS FOR GETTING EDUCATION RESEARCH FUNDING FROM NSF AND IES

Writing a proposal for grant funding in education and psychological science from federal organizations like the National Science Foundation (NSF) or the Institute of Education Sciences (IES) can be a daunting task. Proposals related to education are often reviewed by interdisciplinary panels that consist of a mix of educators and psychologists, as well as scientists from other fields, all of whom may have different expertise and experience related to the project in question.

"What a task, when [someone on the panel] will know your literature cold and expect tremendous detail, almost journal article-level detail, about what you're going to do, and someone else may have never heard of the literature," said Gregg Solomon, a program officer for NSF. "You need to write this on a couple levels."

Solomon spoke alongside fellow NSF Program Officer Rob Ochsendorf, IES Program Officer Erin Higgins, and APS Director of Government Relations Andy DeSoto about funding opportunities for educational psychology research as part of a Funding and Policy webinar recorded April 27.

Making your case

In addition to writing the proposal in a way that appeals to multiple audiences, it's important to establish your project's overarching goal within the first few pages, said Higgins. In framing the proposal, make a clear case for how the research will advance theory but also empower stakeholders related to the topic of study, such as educators, students, parents, policymakers, and the public at large.

"Hit the reviewer over the head with what the point of the project is, with what the point of this whole exercise is, at the very beginning, early and often," Higgins said.

Leveraging interdisciplinary teams

Psychological scientists have submitted fewer NSF proposals in recent years, Solomon noted, even though program officers are eager to fund more research that brings the tools and approaches of cognitive science into constructive contact with other fields.

"If you're somebody who's on the fence about whether to jump into the education research space, remember that it doesn't have to just be you" submitting the proposal, Higgins said. "An interdisciplinary team is going to be such an asset for this kind of work."

Working with program officers

Program officers can be resources throughout the proposal process, Solomon said. They are often available to provide feedback on proposal drafts and, in the event a proposal is later rejected, they can even go through the reviewer feedback with you to help interpret how to revise the proposal for resubmission.

"If you're unsuccessful in your proposal, that doesn't necessarily mean 'go away forever,'" Solomon said. "Most of the proposals that we fund have previously been declined. It's amazing how many people don't come back when, with [an additional] 2 months, 6 months of hard work, there could be a million dollars on the other end for you." ●

See the full article with video at psychologicalscience.org/observer/federal-funding-webinar.

LAUNCHING PROJECTS:
A TWO-WAY STREET

By **Heather Kappes**

In my last column, I wrote about the service-oriented mindset that can be valuable in approaching policy and program work ("OES Collaborations Echo Federal Priorities," May/June *Observer*). Academic researchers tend to start a project by thinking about what hypothesis they want to test or what process they want to understand. Being service-oriented means that if you're working with a government office concerned with low benefits takeup, medication overprescription, inefficient energy use, or confusion about a form, you'd start instead by thinking about which theories or interventions might be useful to address this challenge.

But being service-oriented is not the same thing as saying yes to every project. There are some government agency challenges that behavioral scientists are not well suited to address. The Office of Evaluation Sciences (OES), where I am a fellow, has a list of considerations called "project building blocks," and we generally take on a new project only when each of these building blocks is present.

The first building block for a new collaboration at OES is that the outcome of interest has to be tied to the actions that individuals take. These actions look different in different situations; they can range from a farmer contacting a county loan office, to an individual enrolling in the Federal Health Insurance Marketplace, to a woman attending a maternal health appointment. Outcomes that can't be achieved by changing individuals'

actions aren't a good fit for the types of research insights OES can apply.

OES also has a strong preference for randomly assigning an intervention (e.g., different versions of a letter), so the opportunity to apply randomization is a second project building block.

Third, evaluation projects need to have adequate samples. Large samples allow for more precise estimates of effects, meaning that even null findings can be used to inform program design (and aren't so noisy that they can't rule out the possibility of large effects).

One thing to consider here is that the key number for the sample is typically the unit where randomization occurs. Think of a state labor department with 20 offices serving a total of 100,000 job seekers. If the goal is to randomly assign offices to use a new procedure or proceed with business

as usual, then the sample size is effectively 20 instead of 100,000, likely too small to be informative. Careful power analyses can inform decisions about whether the available population is large enough to make a project meaningful.

A fourth building block is something I've written about before: the availability of administrative data that capture the outcome of interest.

As an aside, OES has recently taken on more quasi-experimental (nonrandomized) evaluations and even some small-sample qualitative research that doesn't rely on administrative data. These sorts of projects are undertaken to meet specific objectives, like the desire to better understand the challenges that local governments faced in quickly designing and launching small business grants and loans during COVID-19.

Heather Kappes has a PhD in social psychology from New York University and is an assistant professor of marketing at the London School of Economics and Political Science. During the 2020–2021 academic year, Heather is served as a fellow at the Office of Evaluation Sciences, part of the U.S. General Services Administration, as well as a visiting behavioral insights scholar at APS. She can be reached on Twitter (@heatherkappes) or by email at h.kappes@lse.ac.uk.

I'll mention one final project building block: OES takes on projects only if there is a dedicated agency collaborator willing to work alongside OES and share results across government agencies. We think of this person as a project champion.

I have to admit that having an agency collaborator is a "building block" that I would have largely taken for granted a year ago. However, my OES colleagues have convinced me that in some ways, this is the single most important ingredient for making sure a project will succeed. This person often plays a key role in getting results acted on—ensuring that the evidence is utilized instead of ignored. A priority goal for the current team is tracking and improving the utilization of evidence that OES produces, which is another reason a dedicated collaborator is important.

Of course, many researchers who work in universities and labs also

5 Building Blocks for OES Collaborations

- Desired outcome tied to individuals' actions
- Opportunity to apply randomization
- Adequate samples for evaluation projects
- Administrative data captures the outcome
- Project champion

want to know that their work is being utilized. It's probably easier to track "impact" just in terms of citation counts for articles, but many universities also explicitly value research that has an impact on nonacademic audiences. My own employer, the London School of Economics and Political Science, has a "knowledge exchange and impact" unit that helps faculty and staff build the relationships that enable this kind of impact—and identify metrics to track it.

I'm hopeful that this description of OES's project building blocks makes it a little easier to understand what does and doesn't make for a promising project in the government setting. I imagine that other government-based teams have their own sets of considerations, but I'd be surprised if they didn't overlap quite a bit with what's important to OES. ○
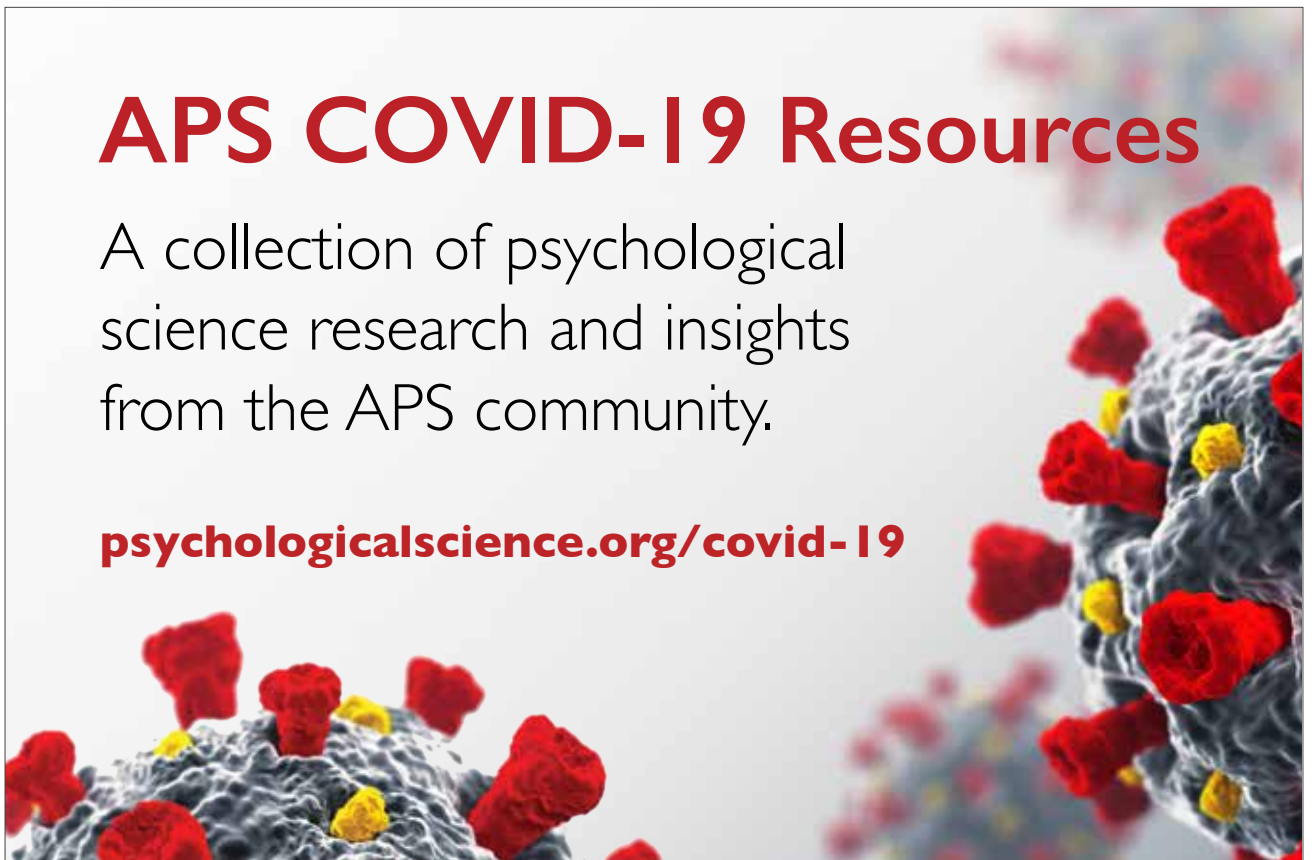
NATIONAL SCIENCE FOUNDATION GRADUATE RESEARCH FELLOWSHIP

Kathy Do, a postdoctoral fellow at the University of North Carolina at Chapel Hill, shares her insights on this prestigious recognition.

The U.S. National Science Foundation (NSF) is one of the premier funders of basic research. NSF comprises seven directorates, including the Directorate for Social, Behavioral, and Economic Sciences and the Directorate for Education and Human Resources, which provide critical support to psychological scientists. In 2020, NSF's budget was $8.3 billion USD.

The Graduate Research Fellowship Program (GRFP) invests in the United States' future scientists, helping to advance their research careers and graduate educations. The program provides roughly 2,000 awards every year to individuals pursuing research-based master's or doctoral degrees in science, tech, engineering, and math.

Kathy Do recently completed her PhD in psychology and neuroscience at the University of North Carolina at Chapel Hill under the mentorship of Eva Telzer. She will be starting a postdoctoral fellowship this summer at the same university, where she will work in the Developmental Personality Neuroscience Lab led by Michael

Hallquist. Throughout graduate school, Do was actively involved in several departmental and university initiatives aimed at promoting diversity in and the accessibility of science, a goal that resonates with her as a female, ethnic-minority, first-generation student.

Kathy Do

What are you researching?

My research examines the neurocognitive mechanisms by which adolescents learn and use information from their social environment during decision making. I am particularly interested in understanding how susceptibility to social influence interacts with social context and developmental timing to confer risks and benefits for the health and well-being of youth. To answer these questions, I use experimental, neuroimaging, and longitudinal methods to characterize the role of brain development in adolescents' sensitivity to and navigation of their changing social landscape.

My dissertation work with Eva Telzer examined how parents and peers influence risky decision making across social contexts and across development. In my postdoctoral work

with Michael Hallquist, I'll explore how internal processes, such as valuation and cognitive control, interact and inform social decision making in young people. These latter efforts are motivated by a new conceptual framework that I proposed with my colleagues to formalize the complex learning and decision-making algorithms that explain how social influence affects brain and behavior across development.

How has the NSF GRFP supported your research and training?

The NSF GRFP has given me the independence to explore and pursue my research interests, stay engaged in mentoring young people, and continue to publish and share my findings at conferences and within my community. The dedicated research time has afforded more opportunities to learn innovative and rigorous statistical methods that capture adolescent development, as well as build upon my multidisciplinary training by developing research collaborations across labs and universities.

What was the application process for the GRFP like?

My application process was one of perseverance: I applied once before graduate school and twice in graduate school (now limited to once as a graduate student), ultimately receiving the NSF GRFP on my third try. The application required a personal statement (three pages) and research proposal (two pages). To help craft my statements, I sought example materials from past NSF GRFP awardees in my department, as well as feedback from colleagues and mentors on many drafts. I wanted to apply to the NSF

Grant Information

- **Country**: United States
- **Organization**: National Science Foundation
- **Grant Mechanism**: Graduate Research Fellowship Program (GRFP)
- **Amount**: Annual stipend of $34,000 and a cost of education allowance of $12,000 to the institution.

Kathy Do preparing an adolescent participant for a fMRI scan at the Biomedical Research Imaging Center at the University of North Carolina at Chapel Hill.

GRFP because I was impressed by its extensive network of fellows and resources/support and its commitment to funding scholars whose research will directly benefit society.

What advice do you have for researchers applying for the GRFP?

I think the hardest part of applying to the GRFP (or any grant/fellowship) is effectively communicating the "how" and "why" of your research to others who can support and benefit from this work. When crafting your statements, remember why you are excited about your research questions, who stands to benefit from discovering those answers, and what makes you the best person to conduct that research. And don't give up on your ideas—a different funding mechanism may be a better fit in the end! ◉

Further reading

Do, K. T., McCormick, E. M., & Telzer, E. H. (2020). Neural sensitivity to conflicting attitudes supports greater conformity toward positive over negative influence in early adolescence. *Developmental Cognitive Neuroscience.* Advance online publication. https://doi.org/10.1016/j.dcn.2020.100837

Do, K. T., Sharp, P. B., & Telzer, E. H. (2020). Modernizing conceptions of valuation and cognitive-control deployment in adolescent risk taking. *Current Directions in Psychological Science*, *29*(1), 102–109. https://doi.org/10.1177/0963721419887361

Follow the APS Guide for the NSF Graduate Research Fellowship Program: psychologicalscience.org/nsf-grfp-deadline.

Learn more about the NSF Graduate Research Fellowship Program: nsfgrfp.org.

Interested in learning more about funding opportunities for psychological scientists?
Visit the Funding and Policy page on the APS website (psychologicalscience.org/policy) for updates.

Previous "Inside Grants"
U.S. National Institutes of Health F32 Postdoctoral Fellowship (Jan/Feb 2021 *Observer*)
UK Economic and Social Research Council Research Grant (March/April 2021 *Observer*)
National Institute of Mental Health R15 Research Enhancement Award (May/June 2021 *Observer*)

The Future of Work

Where and how work gets done—and who does it—may never be the same.

REIMAGINING WORK AFTER COVID

The conversation around teleworking is shifting from 'Is remote work good or bad?' to 'How can we make remote working successful?'

By Kim Armstrong, APS staff

Let's face it, the past year of remote working—for those fortunate enough to be able to do so—hasn't always been all that #RemoteLife is hyped up to be. Unlike the merry bands of "digital nomads" known for cranking out code in sun-soaked tropical locations, the teleworker class of 2020 often found themselves hunched over kitchen tables or cradling infants on conference calls, with long stretches in which there was nowhere to go and no one to see safely outside of business hours.

These and other work-at-home realities caused symptoms of depression and anxiety to more than double compared to pre-pandemic levels in a sample of 178,885 Norwegian adults, according to new research published by Omid V. Ebrahimi and colleagues Asle Hoffart and Sverre Urnes Johnson (University of Oslo) in *Clinical Psychological Science*. Those who worked remotely and followed social distancing guidelines closely were harder hit psychologically than those who did not, either because they were required to work in person or simply chose not to follow recommendations, Ebrahimi and colleagues noted.

With vaccines increasingly available, however, parts of the world are starting to open up again, leaving employees and their employers to hash out what comes next. As the past year has laid bare, many office jobs can be done remotely. This "large-scale experiment" has brought about a shift in the narrative, said Ravi Gajendran, a professor of global leadership and management at Florida International University, turning remote work from an alternative arrangement or rare bonus benefit into a more mainstream offering. Gajendran spoke alongside a panel of industrial-organizational psychologists during "Reimagining Work After COVID," a discussion hosted as part of the 2021 APS Virtual Convention.

"The conversation seems to be shifting from 'Is remote work good or bad?' to 'How can we make remote work successful?" Gajendran said. "For the first time, ➡

employee preference for remote work and organizational preference for employees working remotely seem to be aligned—and that's good, because remote work offers many advantages."

Researching SMART work design

Just as the way we work is changing, the way researchers study work design needs to change too, said Sharon Parker, a professor of organizational behavior at Curtin University in Australia and another speaker on the APS Virtual Convention panel. Until recently, there have been two primary approaches to the way teleworking is studied.

The first approach tends to focus on work design as a moderator of performance. A study in this vein might examine how the intensity of remote work—how many days or hours of the work week are spent outside of the office—interacts with a job's characteristics to lead to certain outcomes. Examples of this kind of research would be studies concluding that remote work is successful only when the role of social support in a job is less relevant to performance.

The second traditional approach positions teleworking as mediator of performance. Examples of this kind of research would be studies concluding that more intense teleworking causes employees to perceive decreased social support, leading them to become emotionally exhausted with their work.

"Both of these perspectives make sense when remote working is for the chosen few, and mostly part-time," Parker said. "But of course during COVID, things changed completely, and we really had a very different situation where just about everybody who could was working from home, irrespective of personal choice or suitability of the task, and often under unusual conditions, without proper time to set up."

In terms of research on work design, this change led teleworking to become the context of labor rather than a variable associated with labor, shifting the focus from the question of which people or jobs are best suited to teleworking to how a job itself can become better suited to a remote environment.

In line with this trend, Parker and colleagues created a work design framework dubbed SMART, in which work that is Stimulating and encourages Mastery, Agency, and Relational contact while promoting Tolerable demands brings out the best in employees, both personally and professionally (Parker et al., 2017). In a study of people working

from home, Parker and colleagues found that low Agency due to increased employee monitoring, a lack of Stimulation in the form of work underload, and some demands that were not Tolerable (high work/home conflict, excessive workload) predicted increased distress among employees over a 12-week period (Knight, Parker, & Keller, 2021).

In another study of remote workers in China at the start of the pandemic, social support—a Relational aspect of work—was especially important in alleviating the challenges of home work and promoting better employee outcomes (Wang et al., 2021).

This research shows that the way work is designed when at home has a strong influence on employee well-being and job fulfillment.

"We've got to move away from this question of 'Should we have remote work or not?' and instead ask 'How do we design smart work in the office and at home?'" Parker said.

Who is good at remote working?

As APS Fellow Tammy Allen (University of South Florida), Timothy D. Golden (Rensselaer Polytechnic Institute), and Kristen Shockley (City University of New York) outlined in a 2015 study in *Psychological Science in the Public Interest*, working remotely can offer a range of benefits for employees. Telecommuting has been found to increase organizational commitment, productivity, and supervisor-rated task performance while decreasing absenteeism and work-related stress.

The most effective remote workers tend to be good at self-regulation, Allen and colleagues noted, which allows them to work efficiently without supervision and overcome the temptations of procrastination and cyberslacking.

"The traditional office affords or supplies segregation between work and nonwork, while working from home places workers in a context of complete integration," Allen, a professor of industrial-organizational psychology, said during the convention panel. "Neither of these are necessarily good or bad; it's more about the fit between individual preferences and what the context supplies."

Fortunately, Allen and colleagues noted in their article, existing research suggests that individuals tend to be pretty good at judging which work context works best for them.

In a 2015 study of 249 call center employees in China by Nicholas Bloom (Stanford University) and colleagues, for example, workers randomly assigned to telecommute were found to be 13% more productive, more satisfied with their

"The traditional office affords or supplies segregation between work and nonwork, while working from home places workers in a context of integration." — APS Fellow Tammy Allen

work, and less likely to leave an organization than those in the office. After the experiment, only half of the home-based workers and one-third of the office workers elected to continue working remotely, but that self-selected sample was found to be twice as productive when telecommuting was compared to the group of employees who had been randomly assigned to work from home.

What jobs are better for remote work?

Before the pandemic, teleworking was mainly reserved for highly educated "knowledge workers" in professional settings like banking and IT—but now, most people who can work from home have gotten a taste of teleworking, and many want to continue, Gajendran said.

Gajendran and Golden found in a 2018 study of 273 employees that the extent of time spent working remotely was linked to higher performance, especially among employees who rated their jobs as high in complexity and among those whose jobs could be performed largely independently of coworkers.

Not everyone enjoys working from home, of course. A quiet office can serve as a workday respite for employees with a hectic homelife; others have a strong preference for connecting with coworkers face-to-face. Even for individuals who can work from home effectively, the prospect of managing a hybrid office raises new questions about how to strike the right balance between autonomy and coordination within an organization, Gajendran added. Beyond the question of who gets to (or has to) work remotely and how often, mainstream teleworking presents an opportunity to redefine what the office is for.

It's possible that the office could remain just another space for working, with no formal distinction between a workday spent at home or in the office, Gajendran explained. Alternatively, an organization that allows employees to work from home 2 or 3 days a week might designate office days for meetings, networking, and group work while reserving more independent tasks for deep-focus days at home.

Organizations that use a hybrid model may also have to consider how to counteract "face-time bias," which can lead

Surveying surveillance

Through 2020 and into 2021, organizations have increased their use of surveillance software for tracking performance, even outside of conventional office settings. Surveillance methods can range from always-on webcams for remote office workers to GPS location tracking for Uber drivers and electronic proctoring of students during exams.

Another convention panelist, APS Fellow Tara Behrend, a professor of industrial-organizational psychology at Purdue University, addressed this topic. "Technology is changing the world of work. Specifically, the future will be characterized by omnipresent surveillance for many workers, especially for those with less control and power."

The effects of these potentially invasive practices can vary significantly, but people's perception of surveillance often depends on the methods used—that is, whether the tech aims to survey their behavior, body, or mind, Behrend said. Through a pair of pre- and mid-pandemic surveys, Behrend and colleagues found that, on average, people thought surveillance of a person's body and mind—for example, measures of blood pressure or covert monitoring of emails between coworkers—was almost never acceptable (Ravid et al., 2020). Surveying individuals' behavior through audio or video recording was perceived as far more permissible, especially if it was done with informed consent.

This may be because these behaviors are viewed as occurring in a more public domain, regardless of where the work actually takes place.

"People are fairly sophisticated in thinking about when these things are acceptable and when they might not be," Behrend said. "It tells us that these fuzzy work and nonwork boundaries are really prominent in people's minds, and there isn't a distinction. Worker privacy will become a luxury unless it is regulated and protected."

in-office employees to be favored over equally productive remote workers for raises and promotions, in addition to finding new ways to structure processes like meetings so that all employees can participate.

How should we work remotely?

As the pandemic has proven, there are a number of tactics that anyone can use to help manage distractions while working from home, regardless of personal preference ➡

Automation and job security

COVID-19 has highlighted numerous aspects of workplace culture that will continue to shape the way we work in the future—including the use of robots and other forms of automation, according to Kai Chi Sam Yam, a professor of management and organization at the National University of Singapore and recipient of an APS Rising Star award.

"Automation has been the discussion for many years over the past decade, and COVID-19 has definitely accelerated this impact," said Yam, another convention panelist.

In a series of studies under revision of 185 U.S. metro areas, Yam and colleagues found that a rise in robot use within an urban region was associated with an increased perception of job insecurity, as reflected by greater activity on job-search websites without an uptick in unemployment in that area. In a related study of 118 engineers in India, Yam found that employees who reported higher robot adoption within their workplaces also reported more feelings of job insecurity and burnout.

This suggests that concerns about automation can result in more negative workplace behaviors even when people's jobs aren't necessarily at risk.

The media paint a pessimistic picture of automation, Yam said, but in reality, the challenges involved in making the requisite technological advances—developing a road-ready autonomous vehicle, for example—suggest it will be some time before the full effects of robotics are felt by workforces globally.

"Use of robots is of course a hot topic, but I would say most workers don't need to be too worried about it over the next 5 or 10 years," he said. "This is not necessarily about advancement of technologies, but the neglect of other jobs that are created as a result of the advancement of technologies."

or job fit.

Establishing a routine that mimics the physical boundaries of a traditional workday, for example, can help remote workers maintain work/life boundaries while giving more structure to their day, Allen said. This might include getting dressed in office wear, working in a home office with a door (or at a desk or other area devoted to work), or even going for a walk as a kind of "fake commute"—in addition to going offline at the same time you would otherwise leave the office.

The social features of the home are also important: In a teleworking world, household members are the new coworkers, Allen noted, but although they may make for good company, they can also be a source of distractions throughout the workday.

In addition, the more people there are at home, the more there will be noise, interruptions, and other distractions throughout the day, all of which are associated with reduced productivity. And caretaking responsibilities present employees, and working women in particular, with the pressure to be constantly available to their children, aging parents, or other household members.

Working mothers have been hit especially hard by the pandemic, Allen said, which has highlighted the gender inequities associated with dependent care. Moving into the future, it is important to get serious about national-level supports for working families such as paid family and medical leave, paid sick leave, and affordable childcare that can benefit both remote and office workers. ●

References

Allen, T. D., Golden, T. D., & Shockley, K. M. (2015). How effective is telecommuting? Assessing the status of our scientific findings. *Psychological Science in the Public Interest*, *16*(2), 40–68. https://doi.org/10.1177/1529100615593273

Allen, T. D., Merlo, K. Lawrence, T., Slutsky, J., & Gray, C. (2021). Boundary management and work-nonwork balance while working from home. *Applied Psychology: An International Review, 70,* 60-84. https://doi.org/10.1111/apps.12300

Bloom, N., Liang, J., Roberts, J., & Ying, Z. J. (2015). Does working from home work? Evidence from a Chinese experiment. *The Quarterly Journal of Economics*, *130*(1), 165–218. https://doi.org/10.1093/qje/qju032

Ebrahimi, O. V., Hoffart, A., & Johnson, S. U. (2021). Physical distancing and mental health during the COVID-19 pandemic: Factors associated with psychological symptoms and adherence to pandemic mitigation strategies. *Clinical Psychological Science*. Advance online publication. https://doi.org/10.1177/2167702621994545

Golden, T. D., & Gajendran, R. S. (2018). Unpacking the role of a telecommuter's job in their performance: Examining job complexity, problem solving, interdependence, and social support. *Journal of Business and Psychology 34,* 55–69. https://doi.org/10.1007/s10869-018-9530-4

Parker, S. K., Morgenson, F. P., & Johns, G. (2017). One hundred years of work design research: Looking back and looking forward. *Journal of Applied Psychology, 102(*3), 403–420. https://doi.org/10.1037/apl0000106

Ravid, D. M., Tomczak, D. L., White, J. C., & Behrend, T. S. (2020). EPM 20/20: A review, framework, and research agenda for electronic performance monitoring. *Journal of Management*, *46*(1), 100–126. https://doi.org/10.1177/0149206319869435

Wang, B., Lui, Y., Qian, J., Parker, S. K. (2021). Achieving effective remote working during the COVID-19 pandemic: A work design perspective. *Applied Psychology, 70*(1), 16–59. https://doi.org/10.1111/apps.12290

HEALTHIER AT HOME?

An often-overlooked benefit of the pandemic: Working from home can be good for you, especially for women and marginalized professionals.

By Lynne N. Kennette and Phoebe S. Lin

Months after COVID-19 forced millions of people to begin working from home, politicians and pundits worldwide began to speculate that the pandemic would forever change how and where we work. We certainly wondered ourselves. As psychologists with full-time jobs in academia, we shifted our research and teaching online and quickly began to experience many of the benefits of telecommuting that psychological science has revealed (Allen et al., 2015).

Despite the fact that one of us, Lynne, has two young children, we have found more time for healthy activities, saved money, taken greater advantage of continuing education, and been more available to our students and families alike.

Amid this unprecedented experience, we set out to conduct a review exploring literature related to the benefits we and many other professionals have experienced because of telecommuting. In the pages that follow, we review physiological, psychological, and motivational factors; creativity; emotion regulation; job satisfaction; and productivity—primarily from the perspective of employees.

Physiological uplift

Maslow's hierarchy of needs proposed that humans must meet certain physiological needs (including sleep) before they will be motivated to seek higher-order needs (Maslow, 1943). A key advantage of remote work is the ability to sleep in, thus allocating more time to rest and ➡
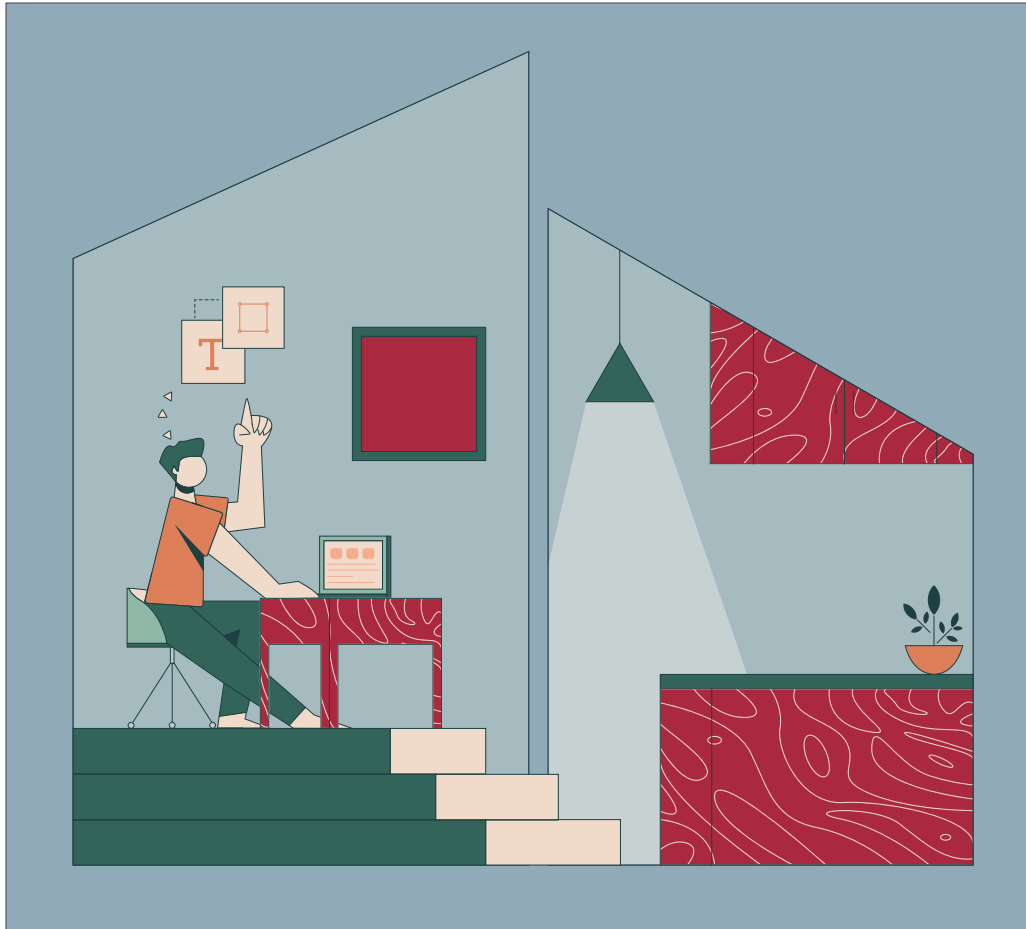
this reduction in stress (Duxbury & Halinski, 2014; Pink, 2009), a topic we will address later.

In addition to reducing stress, the flexibility of remote work may encourage employees to engage in healthier habits, such as by spending more time walking (Chakrabarti, 2018) or eating healthier (Allen et al., 2008).

Psychological positivity

More sleep, less stress, more time to exercise, and fewer opportunities to eat out can all lead to more positive mental health outcomes. Moreover, better emotional well-being and physical health can result from spending more time with family and having more disposable income (Johnson & Krueger, 2006; Pantell et al., 2013). Additionally, it appears that we can experience physical and psychological benefits even when we obtain social support virtually (Gilmour et al., 2020).

recuperate. When we no longer have to commute, we can benefit from additional sleep, which can improve well-being (Hirshkowitz et al., 2015).

Moreover, because commuting can cause stress, remote work can reduce stress (Gajendran & Harrison, 2007; Sardeshmukh et al., 2012). For instance, long periods of driving induce the release of cortisol—a stress response that has been linked to high blood pressure (Antoun et al., 2017; Hoehner et al., 2012). Reducing the financial burdens associated with commuting, such as not having to pay for parking or gas, can also reduce stress and boost physiological health (Sinclair & Cheung, 2016). Moreover, people who telecommute experience significantly lower work-related stress and work exhaustion (Gajendran & Harrison, 2007; Golden, 2006; Sardeshmukh et al., 2012). Some have proposed that the increase in autonomy when working from home is at least partially responsible for

Further, working from home can remove some barriers that may cause psychological distress. With remote work, women may be able to manage morning sickness, for example, without having to take time off or share personal information with an immediate supervisor. This benefit would also apply to workers who are caregivers for sick or elderly relatives. And since caregiving responsibilities primarily fall on women (Sayer, 2016), this could increase equity related to employment, including, potentially, reducing the wage gap, especially if flexible scheduling allows women to work the same hours and perform at the same level as men. Individuals who are primary caretakers may be able to enter or return to the workforce more easily. Virtual

Lynne N. Kennette is a professor of psychology at Durham College in Oshawa, Ontario, Canada. She is passionate about teaching and optimal student learning, which guide her research program.

Phoebe S. Lin is an associate professor of psychology at Framingham State University, in Framingham, Massachusetts. Her research interests are in the psychology of prejudice and inclusive teaching practices.

A number of possibilities exist as to why telecommuting improves job satisfaction, but control and autonomy seem to be central.

meetings may also level the playing field in another way: The dominant voice is no longer the only one heard, so everyone can contribute, including minorities who may not feel as comfortable speaking in groups (Global Workplace Analytics, n.d.; Phillips et al., 2018; Walls & Hall, 2018).

Finally, remote work can improve mental health by limiting our time with toxic coworkers. This can decrease incidents of workplace bullying and perceptions of a hostile work environment (Høgh et al., 2021), especially for people with marginalized identities. For instance, employees of color, who are more likely to report a hostile work environment and experience microaggressions (Pitcan et al., 2018), may choose to limit or even eliminate their interactions with prejudiced coworkers. A related benefit is increased equity for members of minority religious groups. Jewish and Muslim employees are more likely than Christian employees to experience prejudice and discrimination in the workplace (Cantone & Wiener, 2017). Christianity is often cast as the "default" religion; whereas workplaces often close during Christmas, employees of other religions must request time off to celebrate religious holidays. The increased flexibility of remote work can allow employees to set their own hours and adjust for religious holidays without needing to request accommodations.

Relatedly, transgender employees often do not feel comfortable disclosing their gender identity at work, and many have reported experiences with prejudice at various stages of their career including the hiring process, navigating the workplace, and advancing through promotions (Fisher & Jónsdóttir, 2021). With remote work, transgender individuals can obtain greater autonomy in whether they disclose their gender identity to coworkers, including supervisors. Higher levels of autonomy, in turn, predict higher levels of job satisfaction (Liu et al., 2005).

Another benefit of remote work is associated with caring for children. When working at home, women may be able to nurse an infant or manage breast pumping more easily, for example. Further, working from home can reduce the amount of time children need to spend in childcare, reducing financial strain on parents. Because working from home may allow a more flexible workday (e.g., with one parent working from 5 a.m. – 1 p.m. and the other from 1 p.m. – 9 p.m.), it may be possible to reduce the number of days/hours that children spend in childcare settings, thus reducing the overall annual cost. Childcare can range from $5,178 to $20,125 annually in the United States (Child Care Aware of America, 2017). Easing that financial burden can decrease stress, giving employees more cognitive resources to focus on work and increase creativity/productivity. Further, having at least one parent consistently present in the home can increase parent-child bonding and parental involvement, which predict healthier outcomes for children, such as healthier self-esteem, improved academic outcomes, higher empathy, and improved conflict resolution skills (Ahmad et al., 2018; Levine & Heller, 2011; Miedel & Reynolds, 1999).

Emotional calm

Kearns and colleagues (2000, 2012) found that most people derive psychosocial benefits from the home, such as having a sense of retreating from the world, being free to do what they want (autonomy/control), and being protected (security). Working from home means being able to control many aspects of where we work, from which room in the house to where we travel or live. Home can help us regulate emotions in three ways: Home is a flexible space that can easily be changed in ways that please all of our senses; the physical space or footprint of the home is stable and reliable because it doesn't change; and home is limited to a small number of people who can occupy that space (Graham et al., 2015).

Additionally, people like being in rooms with windows, which is often not possible in cubicle-filled office environments. Windows may provide micro-restorative opportunities throughout the day, especially if the views show natural elements rather than built structures, which can improve mood and well-being (Park et al., 2010; van den Berg et al., 2015). Seeing greenery is also associated with better memory performance and lower stress (Lega et al., 2021). And being *in* greenery has additional beneficial effects. For example, gardening can promote better mental health by improving our mood and reducing stress and cortisol levels (van den Berg & Custers, 2011). Arguably, the ability to open a window and take in some fresh air on nice days can also create a positive work environment, contributing to emotional well-being.

Job satisfaction

One well-documented advantage of telecommuting is that it improves job satisfaction (Bloom et al., 2015; Gajendran & Harrison, 2007). A number of possibilities exist as to why, but control and autonomy seem to be central.

A meta-analysis of 485 studies indicated that poor job satisfaction predicted exhaustion tied to burnout, anxiety, depression, and poorer physical health outcomes (Faragher et al., 2013). Low work-related stress and ➡

high employee morale create a more positive working environment, increasing job satisfaction and decreasing sick days (Kaliski, 2007; Sudatta & Payal, 2016). Emotional well-being also plays a direct role in job satisfaction (Judge et al., 2020), which can increase motivation, productivity, and performance (Aziri, 2011).

Motivation and commitment

Telecommuters have higher levels of commitment to their organizations (Golden, 2006; Martin & MacDonnell, 2012). Pink (2009) proposed that for employees to be intrinsically motivated, employers need to address three internal drives: autonomy (control), mastery (progress, or continual improvement), and purpose (feeling like a part of something bigger). Using tangible rewards and punishments does not increase intrinsic motivation (Ariely et al., 2009; Deci, 1971; Pink, 2009). But allowing employees to decide what they work on or where they work does. Autonomy and increased flexibility are both empowering and motivating. Working remotely can also lead to greater autonomy and flexibility, providing more freedom to choose how to approach problems without fear of being monitored or micromanaged.

Remote working can also promote equity, which can increase motivation in marginalized groups. Employees of color have consistently reported lower job satisfaction and less favorable perceptions of equity in the workplace, both in academia and in applied fields (Ali, 2009; Dowler, 2005; Livingston, 2020). Greater equity could motivate employees to be more productive. Employees who perceive being treated more favorably than their co-workers tend to have higher levels of productivity, whereas those who perceive

being treated less favorably are less productive, likely due to resentment (Bourdage et al., 2018). In contemporary North American culture, those who spend more time at the office are seen as more committed to their jobs and employers (Williams & Boushey, 2010). This benefits heterosexual men, as caretaking and household responsibilities fall more heavily on women (Sayer, 2016). Although time spent at work is used as a heuristic to estimate commitment, this does not take into account the actual amount of time spent working, quality of work, or productivity. With remote working, employees can be evaluated more on the quality of their work, increasing meritocracy and equity.

Similarly, working from home can weaken the "maternal wall" (Crosby et al., 2004), or the lower salaries and likelihood of promotion for mothers compared with women who do not have children. Women who are parents are also judged as less competent and less committed to work than men (regardless of parental status) or women with no children (Correll et al., 2007), reflecting assumptions that women who are parents prioritize family above career. Further, even women who are pregnant and not yet parents face prejudice and discrimination in the hiring process (Morgan et al., 2013) and in the workplace if they are already employed (Williams & Boushey, 2010). By helping women avoid disclosing their pregnant or parental status, working remotely can reduce biases in hiring, performance evaluations, and pay and promotion decisions.

Creativity and productivity

Remote work may foster creativity; autonomy is motivating and encourages more creative thinking (Pink, 2009).

Hunter (2018) proposed that even researchers in the life sciences have been able to work from home more and that, anecdotally, they are happier (due to better work-life balance) and that this greater flexibility in work arrangements has resulted in increased creativity at work. Positive moods foster greater creativity compared with negative moods, even if induced experimentally (Xiao et al., 2015).

Furthermore, working from home increases productivity (Gajendran & Harrison, 2007; Gajendran et al., 2015; Martin & MacDonnell, 2012). Bloom (2014) reported that employees working from home answered 13.5% more phone calls than those who were in the office, demonstrating higher productivity in a measurable way. (Bloom and colleagues replicated this finding in 2015.) More recently, Choudhury and

colleagues (2021) showed a 4% increase in productivity among U.S. Patent Office employees who worked from home. Barrero and colleagues (2020b) estimated that the pandemic significantly reduced U.S. commuting times and that at least one-third of this saved time has been allocated to work-related tasks.

In addition, two polls of remote workers during the pandemic showed that the vast majority (84.7% of U.S. and 90% of Canadian workers) reported being equally or more productive than they had been before the pandemic, in their physical workplaces (Barrero et al., 2020a; Mehdi & Morissette, 2021). Of the Canadians reporting less productivity, 20% cited the additional burden of care responsibilities (for children or elderly parents) as the main reason (Mehdi & Morissette, 2021). This is primarily a pandemic effect, given that the children of working parents would typically be in school or daycare for at least part of the work week.

Additionally, remote work reduces absences, as many people who take a "sick day" are actually taking a day off to manage stress, care for sick children, or address other personal needs (Dionne & Dostie, 2007; Gibson et al., 2002; Global Workplace Analytics, n.d.; Stavrou, 2005). Further reducing absenteeism is the limited transmission of illnesses in workplaces and public transportation.

Conclusions

Having worked from home over the past year, we have personally experienced many of the benefits outlined in this paper. Lynne, as a mother to two young children, used asynchronous teaching to schedule her work around their needs, including online schooling schedules. Both of us have been able to schedule most of our work to match our availability, needing only to work around synchronous meetings.

The benefits of asynchronous work have also helped us prioritize self-care and mental health. We have been able to spend more time outdoors, get more exercise, find time to relax, and eat a healthier diet, thanks to more flexibility for meal planning. We have saved money and gained at least 2 hours each day by removing lengthy round-trip commutes. We have been far more productive and have attended more online professional development than we could have in person. Technological advancements allow for remote meetings, and we have found that the recording of these meetings also increases control, flexibility, and productivity. In some instances, online webinars, workshops, and meetings allow for multitasking such as cooking dinner and tuning in at the same time.

An additional benefit for academic instructors is greater availability for conversations with our students. We can schedule more virtual office hours than we could before the pandemic, when we were not on campus some days and lost time commuting.

Finally, we have found it psychologically calming to remain in the safety of our homes, especially in an increasingly unsure world.

We recognize that these benefits may not be available to everyone working from home, given wide variances in work requirements, personal dynamics, family responsibilities, and more. But as the pandemic recedes and life returns to "normal," we believe that telecommuting and work-from-home arrangements should continue to be offered as long-term options to employees who can benefit—just as we have. ⦿

Selected references

Allen, T. D., Golden, T. D., & Shockley, K. M. (2015). How effective is telecommuting? Assessing the status of our scientific findings. *Psychological Science in the Public Interest, 16*(2), 40–68. https://doi.org/10.1177/1529100615593273

Aziri, B. (2011). Job satisfaction: A literature review. *Management Research and Practice, 3*(4), 77–86.

Barrero, J. M., Bloom, N., & Davis, S. J., (2020a). *Why working from home will stick*. Becker Friedman Institute for Economics (Working Paper No. 174). http://dx.doi.org/10.2139/ssrn.3741644

Bloom, N., Liang, J., Roberts, J., & Ying, Z. J. (2015). Does working from home work? Evidence from a Chinese experiment. *The Quarterly Journal of Economics*, 165–218. https://doi.10.1093/qje/qju032

Gajendran, R. S., & Harrison, D. A. (2007). The good, the bad, and the unknown about telecommuting: Meta-analysis of psychological mediators and individual consequences. *Journal of Applied Psychology, 92*, 1524–1541. https://doi.org/10.1037/0021-9010.92.6.1524

Pink, D. H. (2009). *The surprising truth about what motivates us*: Riverhead.

van den Berg, M. M H. E., Maas, J., Muller, R., Braun, A., Kaandorp, W., van Lien, R., van Poppel, M. N. M., van Mechelen, W., & van den Berg, A. E. (2015). Autonomic nervous system responses to viewing green and built structures: Differentiating between sympathetic and parasympathetic activity. *International Journal of Environmental Research and Public Health, 12*(12), 15860–15874. https://dx.doi.org/10.3390%2Fijerph121215026

RAGE AGAINST THE MACHINES

Humans distrust robots in the workplace, psychological research shows

By Scott Sleek

Since the dawn of the industrial revolution, laborers have battled the prospect of technology replacing them. The original "Luddites"—British weavers and textile workers—fought the advent of mechanized looms and knitting frames in the early 1800s. A century later, Belgian lamplighters smashed the electric streetlamps that were replacing the gaslights they fired up.

But in the 21st century, technology is penetrating the last vestige of the human work experience. The machines learn. They adapt. They not only handle blue-collar work but can mimic the skills of journalists, pharmacists, and surgeons.

People are indeed wary of artificial intelligence, and not just because they've been spooked by the murdering machines depicted in the *Terminator* movie franchise or *2001: A Space Odyssey*. They view artificial intelligence as another threat to their jobs.

In 2017, 85% of Americans responding to a Pew Research survey said they favored policies that limited robots to performing hazardous duties. Other studies have validated those sentiments. In a 2020 study out of the Massachusetts Institute of Technology, two economists found that artificial intelligence is hitting the automobile, electronics, plastics, and chemical industries and metals manufacturers the most. And they found a direct link between automation and declining blue-collar income.

Psychological scientists Timo Gnambs from Johannes Kepler University Linz in Austria and Markus Appel of Julius Maximilian University of Würzburg in Germany recently explored the rising wariness many people, particularly blue-collar workers, feel toward artificial intelligence in the workplace.

For their study, Gnambs and Appel analyzed data from the Eurobarometer, a
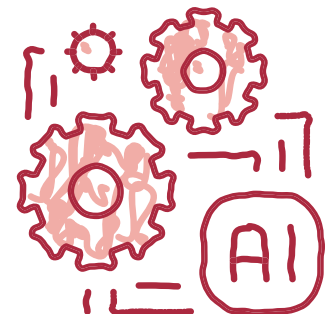
Learning Machines Can Learn Bias, Research Shows

Technology companies have been rolling out a bounty of machine learning tools to help employers eliminate human bias and prejudice from the hiring process. But do they work?

Researchers are beginning to uncover evidence that computer algorithms are only as neutral as the people—mostly White men—who design them.

A team of computer scientists at Princeton University demonstrated this recently in an experiment rooted in the Implicit Association Test (IAT), a tool developed in the 1990s by APS Past President Mahzarin Banaji (Harvard University), APS William James Fellow Anthony Greenwald (University of Washington), and APS Fellow Brian Nosek (University of Virginia). In the IAT, participants categorize words or images that appear onscreen by pressing specific keys on a keyboard. Their response time to different combinations of stimuli is thought to shed light on the mental associations they make, even when they aren't aware of them. The tool has led to the examination of unconscious and automatic thought processes among employers, police officers, jurors, voters, and people in many other contexts.

The research team used an artificial intelligence version of the IAT and set it loose on a wealth of web content, covering 840 billion words. Artificial agents examined sets of role-related words like "engineer" and "scientist" or "nurse" and "teacher" alongside gendered words such as "man" and "female." The researchers found that the program associated female names more with words like "parent" and "wedding" compared with male names. Meanwhile, it associated male names with career words like "professional" and "salary." It also manifested more negative associations with African American names than with European American names (Caliskan et al., 2017).

Evidence has suggested that computer algorithms exhibit racist or sexist tendencies based on patterns learned from public records and other human-generated data. But a study by researchers at Cardiff University and Massachusetts Institute of Technology psychological scientist David Rand revealed that learning machines could develop prejudicial groups all on their own.

The findings were based on computer simulations involving virtual agents. In a game of give-and-take, each agent decided whether or not to donate to somebody from their group or a different group.

As the game unfolded and a supercomputer racked up thousands of simulations, each actor began to learn new strategies by copying others—either members of their own group or the entire population (Whitaker et al., 2018).

The findings showed that actors updated their prejudice levels by preferentially copying those that gained a higher short-term payoff.

The results demonstrate that prejudice transcends sophisticated human cognition and can manifest in "simple agents with limited intelligence," the researchers wrote—a finding with "potential implications for future autonomous systems and human-machine interaction."

References

Caliskan, A., Bryson, J. J., & Narayanan, A. (2017). Semantics derived automatically from language corpora contain human-like bias. *Science*, 356(6334), 183–186. http://doi:10.1126/science.aal4230

Whitaker, R. M., Colombo, G. B., & Rand, D.G. (2018). Indirect reciprocity and the evolution of prejudicial groups. *Scientific Reports*, *8*, Article 13247. https://doi.org/10.1038/s41598-018-31363-z

representative survey of more than 80,000 European residents. The data came from interviews conducted in 2012, 2014, and 2017. The researchers found attitudes toward artificial intelligence souring over the 5 years, with especially negative opinions about robots assisting at work. Gnambs and Appel also found that blue-collar workers were more likely than people with office jobs to harbor negative feelings toward artificial intelligence (Gnambs & Appel, 2019).

Blame the bot

As workers witness the emergence of autonomous robots in factories and offices, they start treating the machines like social actors, research indicates. That includes holding the robots accountable for mistakes, results of a 2019 study suggested. Researchers led by Douglas J. Gillan, a psychology professor at North Carolina State University, recruited 164 participants from Amazon's Mechanical Turk and presented them with several hypothetical errors involving both a human and a robot. In one of the stories, a wobbling operating table jeopardized a heart procedure performed jointly by a surgeon and an autonomous robot. In another, the operator of a non-autonomous military robot made an error during a critical threat response. And in yet another, an autonomous robot misinterpreted an operational command at an auto parts warehouse, resulting in a delayed shipment.

When participants were told that the human controlled the robot, they blamed that individual for the accident. When told that the human ➡

was simply monitoring an autonomous robot, they placed most of the blame on the machine. In the surgery scenario involving both a human and an autonomous robot working in tandem, both shared the blame (Furlough et al., 2019).

The findings signal the complexities that artificial intelligence creates for workplace accountability.

"The study… raises questions about how quickly autonomous robots may be assimilated into the workplace," Gillan said in a press release. "Do employers want to buy robots that may be more efficient, but can be blamed for errors—making it more difficult to hold human employees accountable? Or do employers want to stick to robots that are viewed solely as tools to be controlled by humans?"

Resistance to automation also correlates with antipathy toward immigrants, an empirical report published in *Psychological Science* suggests. Across 12 studies, Monica Gamez-Djokic and Adam Waytz, both of Northwestern University's Kellogg School of Management, found that people who perceive automation as a threat to employment also tend to hold negative perceptions about immigrants. The researchers found support for that link across seven of the studies, involving data stretching from 1986 to 2017 across the United States and Europe. The link held over 3 decades, even after the researchers adjusted for political beliefs and perceptions of other employment-related threats, such as inflation and outsourcing.

Four of the other studies used correlational and experimental methods to examine automation's influence on individuals' perceptions of the group threat posed by immigrants and support for restrictive immigration policies. Two of those studies assessed 265 participants' perceptions of immigrants by using both realistic-threat subscales (e.g., "Immigrants should be eligible for the same health care benefits received by Americans who cannot pay for their health care") and symbolic-threat subscales (e.g., "The values and beliefs of immigrants regarding moral and religious issues are not compatible with the beliefs and values of most Americans").

Finally, Gamez-Djokic and Waytz presented individual participants with one of two scenarios involving a company planning layoffs to cut costs. In the first, the company planned to restructure and downsize certain departments to reduce expenses. In the second, new technology was assuming many of the employees' work duties. Participants faced with the second scenario decided to lay off a greater percentage of immigrants in the workforce (Gamez-Djokic & Waytz, 2020).

Indeed, people often vent their frustrations over automation onto other humans rather than the technology itself, recent research indicates. A team of business researchers, including psychological scientist Armin Granulo of the Technical University of Europe, conducted surveys with
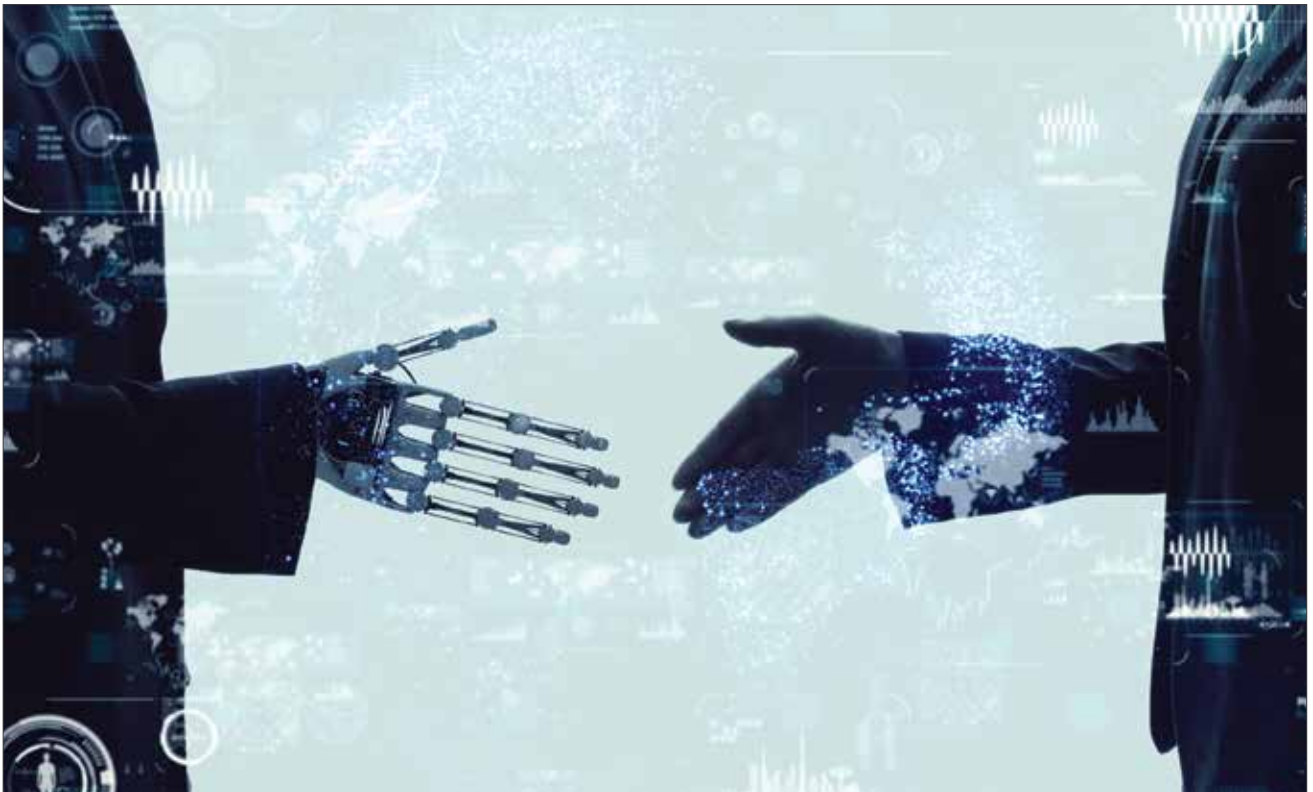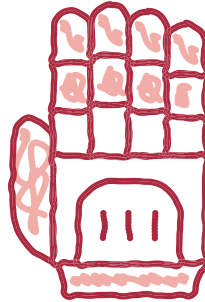
more than 2,000 people. Their sample encompassed students and laborers—including workers who had lost their jobs within the prior 2 years. They presented the participants with a variety of scenarios involving job losses to other people and to robots.

In the abstract, the idea of people's jobs being taken over by robots and software was more palatable to the participants than the idea of jobs being taken by other workers (Granulo et al., 2019). Yet when faced with the prospect of their *own* jobs being cut, they preferred being replaced by a robot rather than a human.

In explaining the paradoxical results, Granulo and colleagues noted that people measure themselves against other people, not machines—so being displaced by automation packs less of a blow to their sense of self-worth. Participants indicated that threats to their self-worth would be reduced even if they were replaced by other employees who relied on technological abilities, such as artificial intelligence, in their work.

The role of education and personality

Psychological scientists also are learning the factors that help people avoid losing their jobs to technology. It comes down to personality traits, intelligence, and vocational interests, as a study led by personality psychologist Rodica Damian of the University of Houston showed.

Using longitudinal data from the American Institutes of Research, Damian and colleagues measured the social background, IQ, personality traits, and vocational interests of 346,660 high school students. They looked at follow-up data for those individuals from 11 and 50 years later, recording their occupations and coding the probability of those jobs becoming automated.

Their analysis showed that the students who were more intelligent, mature, and interested in arts and sciences were less likely to lose a job to automation years later, regardless of their socioeconomic background (Damian et al., 2017). "On average, a one standard deviation increase in each of these traits predicted an average of 4 percentage points drop

in the probability of one's job of being computerized," they reported. "At the U.S. population level, this is equivalent with saving 5.8 million people from losing their future careers to computerization."

The findings signal that traditional education may fall short of addressing upcoming changes in the labor market, Damian wrote. While policymakers talk of the need to make college accessible for more people, machine learning is spreading so fast that a university degree may not be enough to secure a job, she noted. The education system may also need to nurture social skills to help future adults thrive in their vocations.

"The edge," she said, "is in unique human skills." ◉

Scott Sleek is a freelance writer in Silver Spring, Maryland, and the former Director of News and Information at APS.

References

Damian, R., Spengler, M., & Roberts, B.W. (2017). Whose job will be taken over by a computer? The role of personality in predicting job computerizability over the lifespan. *European Journal of Personality, 31*(3): 291–310. https://doi.org/10.1002/per.2103

Furlough, C., Stokes, T., & Gillan, D.J. (2019). Attributing blame to robots: I. The influence of robot autonomy. *Human Factors.* Advance online publication. https://doi.org/10.1177/0018720819880641

Gamez-Djokic, M., & Waytz, A. (2020). Concerns about automation and negative sentiment toward immigration. *Psychological Science*, *31*(8), 987–1000. https://doi.org/10.1177/0956797620929977

Gnambs, T., Appel, M. (2019). Are robots becoming unpopular? Changes in attitudes towards autonomous robotic systems in Europe. *Computers in Human Behavior, 93*: 53-61. https://doi.org/10.1016/j.chb.2018.11.045

Granulo, A., Fuchs, C., & Puntoni, S. (2019). Psychological reactions to human versus robotic job replacement. *Nature Human Behaviour, 3*, 1062–1069. https://doi.org/10.1038/s41562-019-0670-y

Smith, A., & Anderson, M. (2017). *Automation in everyday life.* Pew Research Center. pewresearch.org/internet/2017/10/04/automation-in-everyday-life/

LESSONS FROM THE BAMBOO CEILING

Cultural mismatch, in addition to prejudice, often stands in the way of leadership success for East Asian professionals.

By Ludmila Nunes, APS staff

"The superior man wishes to be slow in his speech and earnest in his conduct."

—attributed to Confucius (551–479 BCE),

from the *Analects*

The last year has intensified scrutiny of social injustices based on race, ethnicity, and gender, with bias against Asians—especially in the United States—attracting particular attention in recent months. Hate crimes against Asians spiked 164% in the first quarter of 2021 compared with the same period in 2020, according to a report from California State University's Center for the Study of Hate and Extremism. Although multiple forces have contributed to the surge, one factor may be resentment toward Asians because of their perceived wealth and professional success.

The reality is far more nuanced, according to Jackson Lu, Mitsui Career Development Assistant Professor of Work and Organization Studies at the MIT Sloan School of Management. "Asians are known as the model minority in the United States, where one joke is that 'I must get an A because I am an Asian—not a Bsian,'" he said at a presentation for an April 2021 APS media briefing on the psychological science of racism. Yet despite having the highest educational attainment, highest median income, and lowest unemployment rate of any racial or ethnic group in the United States (Hsin & Xie, 2014; U.S. Census Bureau, 2019; U.S. Department of Labor, 2019), Asians are underrepresented in U.S. leadership positions.

In a groundbreaking 2020 article published in *Proceedings of the National Academy of Sciences*, Lu and APS William James Fellow Richard E. Nisbett of the Univer-

Glass and Bamboo Ceilings: Intersectional Stereotypes?

The "glass ceiling" refers to the invisible barriers that women often encounter in the workplace that prevent them from ascending to the same leadership levels as men. The "bamboo ceiling" refers to similar barriers faced by Asians. Thus, it might be fair to say that Asian women may have to break through a double ceiling to achieve the professional acknowledgement they deserve.

In a 2018 qualitative study, Shruti Mukkamala (University of California, Irvine) and Karen L. Suyemoto (University of Massachusetts, Boston) found that Asian American women's experiences of discrimination occurred at both the personal and professional levels. These experiences could be grouped in 15 common themes of discrimination, as evidenced in the ways they felt others perceived them: tokenist representative of Asian Americans, mislabeled/assumed ethnicity, foreigner, excluded, smart and/or inevitably successful, culture-based discrimination, criminal, bad driver, denying experiences of discrimination, exotic, not a leader, submissive and passive, cute and small, invisible, and service worker.

Indeed, research has found that Asian women are the least likely group to ascend to positions of power when compared with Asian men and White women. The Ascend Foundation, a nonprofit that advocates for Pan-Asians in North America, analyzed 2018 data from the U.S. Equal Employment Opportunity Commission (EEOC) and examined senior leadership in companies in all industries by race and gender. This led to the use of the Executive Parity Index (EPI) as a metric to compare representation in executive leadership.

Overall, the EPI showed that:

- White men are 165% more likely to be executives than White women

- Asian men are 112% more likely to be executives than Asian women

- White men are 192% more likely to be executives than Asian men

- White women are 134% more likely to be executives than Asian women

	Men	Women	GENDER GAP
White	1.834	0.693	165%
Asian	0.629	0.296	112%
RACIAL GAP	192%	134%	

The Executive Parity Index (EPI) compares representation in executive leadership. The racial gap reveals how White EPI compares to Asian EPI; the gender gap reveals the comparison of EPI for men and women. An EPI above 1.0 suggests group overrepresentation at the executive level. An EPI below 1.0 suggests group underrepresentation.

References

Kim, T., Peck, D., & Gee, B. (2020). *Race, gender & the double glass ceiling: An Analysis of EEOC National workforce data*. Ascend Foundation. ascendleadershipfoundation.org/research/race-gender-double-glass-ceiling

Mukkamala, S., & Suyemoto, K. L. (2018). Racialized sexism/sexualized racism: A multimethod study of intersectional experiences of discrimination for Asian American women. *Asian American Journal of Psychology*, *9*(1), 32–46. https://doi.org/10.1037/aap0000104

East Asian (EA), South Asian (SA), and White CEOs of the S&P 500 companies

No. EA CEOs per million EA people — No. SA CEOs per million SA people — No. White CEOs per million White people

sity of Michigan, Ann Arbor, and Michael W. Morris of Columbia University conducted a series of 9 studies of Asian Americans and other Asians in the United States. The studies employed mixed methods (archival analyses of chief executives, field surveys in large U.S. companies, MBA leader nominations and elections, and experiments). In one study, they analyzed data from companies on the S&P 500—a stock market index that reflects the value of the largest U.S. companies—and found just 16 Asian CEOs in 2017, compared to 440 White CEOs. Viewed another way, although Asians made up roughly 6% of the country's population at that time, they represented only 3% of the CEOs of S&P 500 firms. A 2015 study by the Ascend Foundation, a nonprofit organization for Asian professionals, analyzed the number of employees in the management pipeline of five large technology companies (Google, LinkedIn, Yahoo, Hewlett-Packard, and Intel). Asians were found to be well represented in the companies' nonmanagerial workforces but underrepresented at the executive level.

Lu further addressed this disparity in the APS briefing. About 11% of associates at U.S. law firms are Asian, but only 3% of partners are, he said. Even in technology, where Asians are the ethnic group most likely to be hired (over 30% of the workforce), they are the least likely to be promoted to senior leadership positions

The Psychological Science of Racism: Expert Panel for Journalists
Researchers spoke about the toll discrimination takes on physical and mental health, particularly in relation to violence and bias against Asians. Jackson Lu discussed the bamboo ceiling phenomenon and its consequences.
Watch the discussion at psychologicalscience.org/racism-expert-panel .

(less than 15% of executives).

Lu and others call this phenomenon the "bamboo ceiling," using the term Jane Hyun coined in her 2005 book, *Breaking the Bamboo Ceiling: Career Strategies for Asians.* Like the metaphorical glass ceiling, which refers to the invisible barriers preventing women from attaining leadership positions in their fields, the bamboo ceiling describes the barriers keeping qualified Asians from attaining leadership positions in the U.S.

The illusion of Asian success

For decades, Asians have been perceived by many as the "model minority": quiet, hardworking, studious, and rule-abiding. William Peterson, a sociologist at the University of California, Berkeley, coined the term "model minority" in a 1966 *New York Times* article praising the ability of Japanese Americans to succeed in the United States. However, the type of seemingly positive stereotyping that Peterson described carried negative consequences. First, it set up an implicit comparison with other minority groups, such as African Americans, and ignored the history and influence of racism in the United States. Second, it ignored the diversity within the Asian community (e.g., Lee et al., 2017). And third, it created a harmful myth about Asians (e.g., Cheryan & Bodenhausen, 2000; Czopp, Kay, & Cheryan, 2015; Kawaguchi, 2003; Suyemoto, Kim, Tanabe, & Day, 2009; Zhang, 2010).

One way the model minority myth is harmful to Asians is that it makes them invisible. "I think precisely because Asians are believed to be the model minority doing just fine, they have received limited attention from scholars and practitioners alike," Lu said at the APS briefing.

To understand the reasons for the bamboo ceiling, Lu and colleagues sought to tear down the positive stereotype of the model minority and look at differences between Asian subgroups in the United States. Across nine studies with more than 11,000 participants, their 2020 article compared the leadership attainment of East Asians (e.g., from Chinese, Korean, Japanese ancestry) and South Asians (e.g., from Indian, Pakistani, Bangladeshi ancestry) and questioned whether cultural differences between those groups could explain different patterns of success in leadership attainment.

In an email to the *Observer*, Lu explained what led to this approach: "Despite the widespread discussion about the 'bamboo ceiling,' it occurred to me that in contrast to the paucity of East Asian CEOs in the United States, well-known companies such as Citigroup, Google, MasterCard, Medtronic, Microsoft, and PepsiCo have all been led by South Asian CEOs. This observation led me to investigate whether the bamboo ceiling is a cultural issue rather than an 'Asian' issue."

In their 2020 article, Lu, Nisbett, and Morris found that South Asians were more likely than East Asians to achieve executive leadership in the United States. For instance, of those 16 Asian CEOs in the S&P 500 in 2017, only three were East Asian, whereas 13 were South Asian (Lu et al., 2020). This pattern was consistent across the years and held across companies in the S&P 1500, which represent over 90% of U.S. market value. The discrepancy is even more striking in light of the fact that the United States' East Asian population is about 1.6 times larger than the South Asian population.

In exploring the reasons for this pattern, Lu and colleagues found that the differences between East Asians and South Asians extended to members of those minority groups who had been born in the United States, indicating that English fluency was not solely responsible for East Asians' disadvantage in leadership. After interviewing diversity offices, employees, and managers, the researchers examined three potential mechanisms that might explain why East and South Asians were so differently represented in leadership positions: prejudice, motivation, and communication assertiveness.

The first two mechanisms did not account for the disparate experiences of East and South Asians. For instance, in measuring experienced prejudice in a sample of MBA students at a top business school, the researchers found that South Asian students reported experiencing *more* prejudice than East Asian students. Similarly, when the researchers measured prejudice from non-Asian Americans toward Asian Americans, they found greater prejudice toward South Asians than East Asians. In his communication with the *Observer*, Lu mentioned a few possible reasons for higher prejudice against South Asians, including their darker skin tone and physical resemblance to certain Middle Easterners. "For instance, South Asians unfortunately experienced considerable ethnic hostility in the aftermath of the 9/11," Lu explained.

Nor did different levels of motivation to become leaders account for the bamboo ceiling. Lu and colleagues found that East and South Asian MBA students did not differ in leadership motivation. A previous survey had also suggested that, compared with non-Asians, in fact, Asians were more likely to aspire to high-ranking jobs (64% vs. 52%; Hewlett, 2011).

That left the last plausible explanation: assertiveness, or the tendency to stand up and speak out for one's interests and concerns when appropriate. Indeed, when the researchers examined assertiveness, they found that ➡
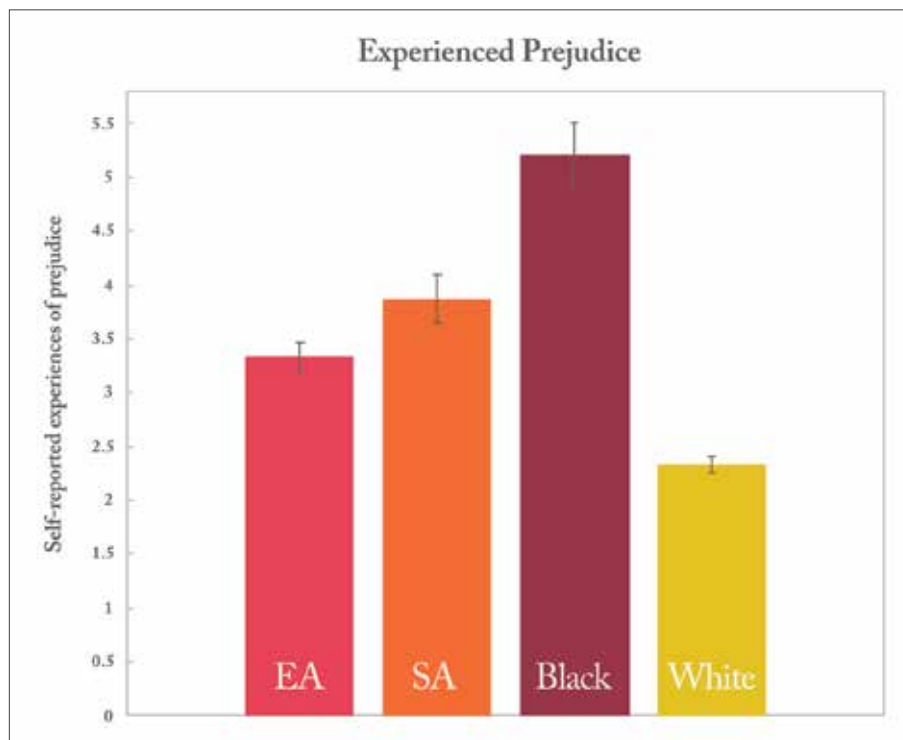
Self-reported experienced prejudice by MBA students, computed using their level of agreement with the affirmations "Sometimes I am treated unfairly because of my ethnicity" and "I often experience discrimination because of my ethnicity."

Self-rated Leadership Motivation
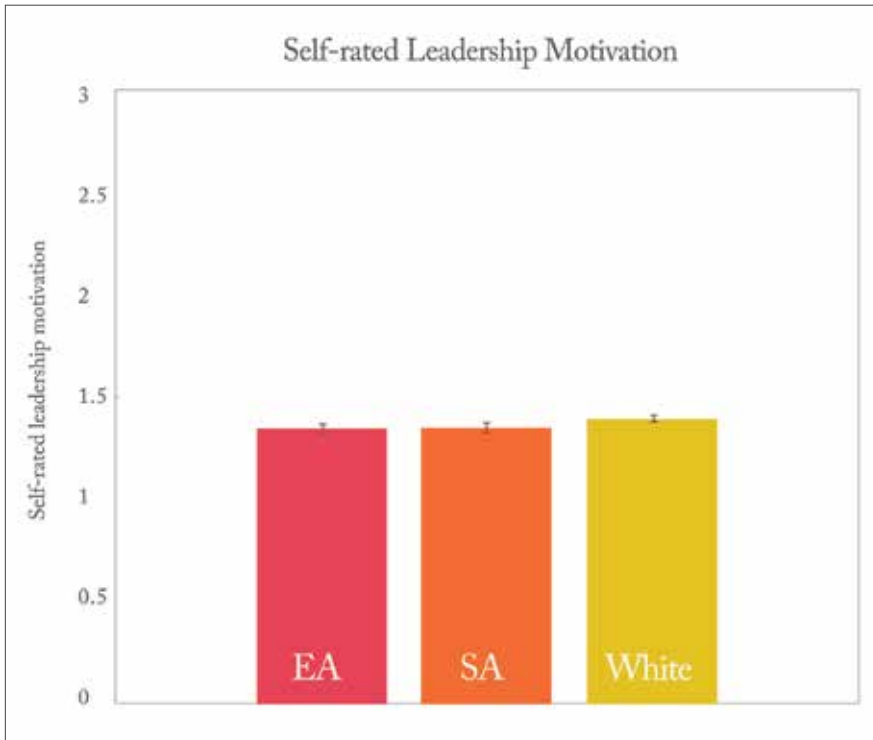
Self-rated motivaton to lead others, computed using the averaged MBA-student rates of interest on 25 work activities involving leadership (e.g., union labor leader, chief executive officer, mayor of a city or town, high-level government official).

East Asians were consistently less assertive than South Asians, as measured via both self-report and other-report. Additionally, East Asians, but not South Asians, were less assertive than Whites. These cultural differences in assertiveness also occurred when Lu and colleagues examined employees from S&P 500 companies. Overall, East Asians' tendency to be less assertive appeared to be one of the main barriers to their leadership attainment.

"So why is assertiveness important for leadership attainment?" Lu asked in the APS presentation. "It is important because according to implicit leadership theory, individuals are less likely to attain leadership positions when their characteristics fail to match the cultural prototype of leaders." Asserting one's opinions signals confidence, motivation, and conviction—all characteristics of the prototypical U.S. leader, he added.

Shattering the ceiling

To a large degree, these ethnic differences in assertiveness can be attributed to culture. Strongly influenced by Confucianism, East Asian cultures are characterized by humility, conformity, and interpersonal harmony. Consider proverbs such as "the nail that sticks out gets hammered down," in contrast to Western proverbs such as "the squeaky wheel gets the oil," explained Lu. This cultural difference appears to impact East Asians' communication style.

South Asian cultures, on the contrary, encourage assertiveness in communication, as exemplified by the Indian tradition of argumentation and debate (see, e.g., the 2005 book *The Argumentative Indian* by economist and Nobel Prize winner Amartya Sen).

In his email to the *Observer*, Lu offered some suggestions for how to resolve the mismatch between East Asians' communication style and American leadership expectations.

"Critically, the onus of breaking the bamboo ceiling should not fall on East Asians themselves. American organizations should evolve their implicit prototype of leadership to fit a diversifying workforce and recognize that there can be more than one successful leadership style," Lu explained. "For example, American organizations could benefit from East Asian cultures' group-focused, protection-oriented leadership style. By appreciating diverse leadership styles, American organizations can better leverage East Asian leadership talent—especially since East Asians appear no less interested in leadership roles than South Asians or Whites."

American corporations must also understand cultural differences among different Asian subgroups rather than lumping all Asians together, Lu said. For example, an East Asian person's quiet reserve may reflect a cultural tendency to value humility, not the absence of an opinion to share. Many U.S. organizations have employee resource groups aimed at fostering a diverse, inclusive workplace, but they typically designate just one group for all Asians, ignoring the cultural differences among subgroups.

At the individual level, East Asians might benefit from increased awareness of this cultural difference. "East Asians should be informed that their cultural tendency to prioritize humility, harmony, and hierarchy may impede them from attaining leadership in the U.S.," Lu said. "They could benefit from communication training that focuses on assertiveness. For example, the East Asian former Democratic presidential candidate Andrew Yang [whose parents emigrated to the United States from Taiwan] actively practiced debate and represented the U.S. national debate team in the world championships."
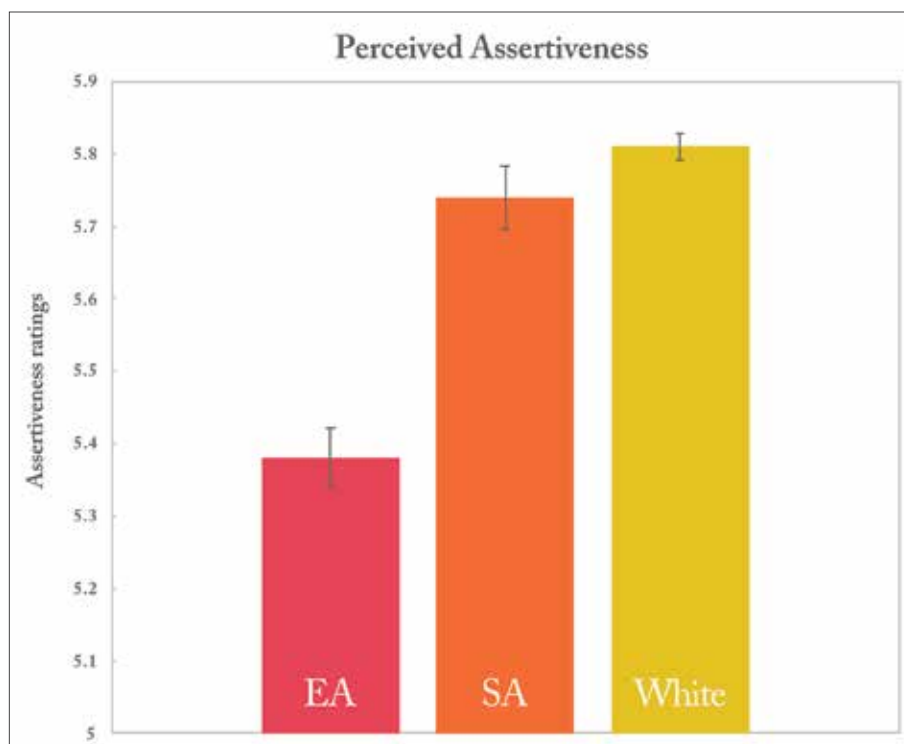
Ratings of perceived assertiveness, computed by averaging the ratings of three statements: "This person would speak up and share his own views when appropriate"; "This person would be willing to engage in constructive interpersonal confrontations"; "This person would be able to stand his ground in a heated conflict."

In his presentation, Lu also highlighted another part of the problem East Asians might face: "People not only believe that East Asians are non-assertive, but also believe that East Asians *should* be non-assertive." As a result, East Asians are in a double-bind: When they are not assertive, they are less likely to attain leadership, but when they are assertive, they risk being viewed as "too assertive." This emphasizes the need for American corporations and their employees to rethink and evolve their implicit prototype of leadership, Lu said. ◉

References

Center for the Study of Hate and Extremism. (2021). *Report to the nation: Anti-Asian prejudice & hate crime. New 2020-21 first quarter comparison data*. California State University, San Bernardino. csusb.edu/sites/default/files/Report to the Nation - Anti-Asian Hate 2020 Final Draft - As of Apr 30 2021 6 PM corrected.pdf

Cheryan, S., & Bodenhausen, G. V. (2000). When positive stereotypes threaten intellectual performance: The psychological hazards of "model minority" status. *Psychological Science*, *11*(5), 399–402. https://doi.org/10.1111/1467-9280.00277

Czopp, A. M., Kay, A. C., & Cheryan, S. (2015). Positive stereotypes are pervasive and powerful. *Perspectives on Psychological Science*, *10*(4), 451–463. https://doi.org/10.1177/1745691615588091

Hewlett, S. A. (2011). Breaking through the bamboo ceiling. *Harvard Business Review*, *3*. https://hbr.org/2011/08/breaking-through-the-bamboo-ce

Hsin, A., & Xie, Y. (2014). Explaining Asian Americans' academic advantage over whites. *Proceedings of the National Academy of Sciences, USA*, *111*(23), 8416–8421. https://doi.org/10.1073/pnas.1406402111

Kawaguchi, S. (2003). Ethnic identity development and collegiate experience of Asian Pacific American students: Implications for practice. *Journal of Student Affairs Research and Practice*, *40*(3), 13–29. https://doi.org/10.2202/1949-6605.1248

Lee, S., Xiong, C., Pheng, L. M., & Vang, M. N. (2017). The model minority maze: Hmong Americans working within and around racial discourses. *Journal of Southeast Asian American Education and Advancement*, *12*(2), 1–20. https://doi.org /10.7771/2153-8999.1153

Lu, J. G., Nisbett, R. E., & Morris, M. W. (2020). Why East Asians but not South Asians are underrepresented in leadership positions in the United States. *Proceedings of the National Academy of Sciences*, *117*(9), 4590-4600. https://doi.org/10.1073/pnas.1918896117

Suyemoto, K. L., Kim, G.S., Tanabe, M., Tawa, J., & Day, S.C. (2009). Challenging the model minority myth: Engaging Asian American students in research on Asian American college student experiences. *New Directions for Institutional Research*, *142*, 41–55. https://doi.org/10.1002/ir.295

U.S. Census Bureau. (2019). *Income and poverty in the United States: 2018* (Current Population Report No. P60-266). census.gov/content/dam/Census/library/publications/2019/demo/p60-266.pdf

U.S. Department of Labor. (2019). [Labor force statistics from the Current Population Survey.] https://data.bls.gov/timeseries/LNS14000003&series_id=LNS14000006&series_id= LNS14032183&series_id=LNS14000009https:/data.bls.gov/pdq/SurveyOutputServlet

Zhang, Q. (2010). Asian Americans beyond the model minority stereotype: The nerdy and the left out. *Journal of International and Intercultural Communication*, *3*(1), 20–37. https://doi.org/10.1080/17513050903428109

ENERGIZING THE UNDERGRADUATE PIPELINE

The process behind a new pathway to academic advancement for underrepresented students in psychological science at ASU

By Arthur M. Glenberg and Erin K. Lanphier

"Racist policies are defined as any policy that leads to racial inequity… intent of the policymaker doesn't matter. It's all about the fundamental outcome."

—Ibram X. Kendi, author of *How to Be an Antiracist,* to Ezra Klein (Klein, 2021)

What does unintended racism look like in the university setting?

In 2018, one of us (Arthur) and a colleague were recruiting a Black student for the graduate program in cognitive science in the Department of Psychology at Arizona State University (ASU). The student's record was promising and included strong letters of recommendation, experience in several research labs, and presentations at local and national conferences. But the student's GRE scores were far below those of other applicants. After much debate, the cognitive science faculty voted against offering admission.

Feeling unsettled by this outcome and curious about the history of diversity in the cognitive science program, Arthur discovered that there had not been a Black cognitive science graduate student at ASU for at least 40 years. Thus, even if the ASU psychology department had made significant strides toward diversity, equity, and inclusion, by Ibram X. Kendi's standard (quote on previous page), at least some policies within the department had unintended racist outcomes that required immediate corrective action.

In 2019, that call to corrective action led the department to spearhead the ENERGIZE initiative (psychology.asu.edu/content/energize-research-initiative). The goal of ENERGIZE is to create a pipeline for undergraduates who are underrepresented in psychological science, whether by racial or ethnic background, age, disability, or other factors. The pipeline leads from their classes into research labs and then onto graduate programs and, ultimately, faculty positions. The initiative's name reflects its dual strategies: It energizes students' interest in scientific psychology, and the students simultaneously energize laboratory research by bringing to bear their lived experiences to help guide research questions. This enriched lab environment makes both research *and* students' lab experiences more relevant.

Getting energized

With full support from the department chair, the first steps we took to establish ENERGIZE included securing cooperation from multiple labs and setting expectations with

The two inaugural winners of the Jenessa Shapiro Undergraduate Research Scholarship, Koop Bills (left) and Valeria Gutierrez (right) at an ENERGIZE reception following the Arizona Psychology Undergraduate Research Conference sponsored by Psi Chi. Photo: Erin Lanphier

Art Glenberg (front left) and Erin Lanphier (front right) meet with Amanda Ryan, Emanuel Angulo Rodríguez, and Missy Tran about creating an ENERGIZE space on campus. Photo: Robert Ewing

lab directors. We have identified three main expectations for participating labs:

First, each lab should set aside at least one position for ENERGIZE students.

Second, each lab director should be flexible with criteria for lab membership, including academic preparation and amount of time committed to research activities. Given the various challenges that are associated with underrepresentation, we recognize that some ENERGIZE students may not yet have acquired laboratory skills or experience in using statistics, methods, or other empirical processes. Some students may need to balance lab responsibilities with financially supporting themselves or their families or caring for family members. Additionally, some students may not have easy or consistent access to campus. For all these reasons and more, underrepresented students may not have as many hours to devote to the lab as other students, and the hours they do have may be at unusual times.

Third, each lab director should commit to face-to-face mentoring of ENERGIZE students, such as by including them in high-level lab meetings.

An important aspect of this plan is that each lab director needs to weigh the expectations we have identified when deciding whether to admit a student. The ENERGIZE team only recommends students. Lab directors make their own decisions regarding students' acceptance. ➡

Arthur Glenberg is a professor emeritus at Arizona State University and the University of Wisconsin-Madison. In addition, he has an appointment at the Institute on Community Integration at the University of Salamanca in Spain.

Erin Lanphier is a practicing clinical psychologist and a member of the teaching faculty at Arizona State University. She serves on the ENERGIZE Committee and the psychology department's diversity, equity, inclusion, and belonging committee, Psych4All.

We next focused on optimizing student recruiting—but our first attempt was pathetic! We set up a table at a recruiting fair for undergraduate research assistants (RAs), but of course most students who came to the fair already knew they wanted to participate in psychological research and understood the importance of that participation for acceptance to graduate study. Their mere presence at the recruiting fair meant they were not our target group.

Our subsequent recruiting attempts have been much more successful. Now, Arthur gives a 10-minute in-class presentation to introductory and junior-level classes. The presentation focuses on the general benefits of conducting research and how fun it can be. He also explains how ENERGIZE has been designed specifically for underrepresented students. Each presentation has resulted in multiple applications.

The in-class presentations have also taught us an important lesson on systemic racism—namely, that not all students are aware of the opportunities and pathways for academic advancement after completing a bachelor's degree. Often, underrepresented students tell us they had no idea that laboratories recruited students as research assistants—even though many lab directors and faculty assume this is common knowledge among undergraduate students. The students have also told us they did not realize that joining a lab is one of the best ways to secure a letter of recommendation required for graduate studies. These students are being left out of undergraduate opportunities essential to academic advancement because of a simple lack of information.

In early 2020, the COVID-19 pandemic required us to change our recruiting strategies again. We pivoted from in-class presentations to offering a 4-minute video (available on the ENERGIZE webpage) to instructors. We ask faculty to either play the video for their classes at the beginning of the semester or link to it in their syllabus or on their course's home page. The video has not been as effective as in-person recruiting, perhaps because pandemic-related constraints have

> **The initiative's name reflects its dual strategies: It energizes students' interest in scientific psychology, and the students simultaneously energize laboratory research by bringing to bear their lived experiences to help guide research questions.**

Art Glenberg and Erin Lanphier, first and second from left, discuss creating a space on campus for ENERGIZE students and faculty. Photo: Robert Ewing

disproportionately affected underrepresented groups. Even so, we have recruited more students with this method than we did with our first attempt at the RA fair. As of late April, 25 ASU psychology labs (representing about 45% of the department) are supporting around 80 ENERGIZE students.

Scaling up the process

As interest in ENERGIZE has grown, we have realized we need to optimize the application process. For example, some students have applied to *all* participating labs—maybe because they really did find them all fascinating, or perhaps because they wanted to increase their chances of being accepted. The early versions of the application process also gave little information to the lab directors about why the student might be interested and what skills they had. We changed the application process to allow students to apply to as many labs as they want, but we also ask them to describe why they are most interested in up to three top choices.

ENERGIZE's initial successes in connecting students to labs has led to both procedural and conceptual changes. The ENERGIZE team and participating lab directors now use shared, online spreadsheets to track students' progress through the application, interview, and acceptance process. Once a student's application is received, we assign them to a graduate student for short-term mentoring. So far, about 30 ASU psychology graduate students have volunteered to mentor ENERGIZE students and prepare them for an interview. Graduate student mentors help answer prospective ENERGIZE students' questions: What clothes should they wear? How should they address a professor? What should they read about the lab?

Limited research positions and mismatched interests mean that not all ENERGIZE applicants end up in a lab. We

Emanuel Angulo Rodríguez and Missy Tran are the two most recent recipients of the Jenessa Shapiro Undergraduate Research Scholarship at ASU. Photo: Robert Ewing.

are currently broadening the scope of the program to support even those who don't. Plans include creating a one-credit professional development seminar open to all ENERGIZE students, whether they are currently in labs or still seeking research experience. The seminar will cover topics like how to prepare a poster or give a succinct 15-minute presentation. We also plan to host monthly dinners to facilitate networking and mentoring. To date, these plans have been on hold because of COVID-19 concerns.

Funding the future

ENERGIZE has benefited from tremendous community financial support, and we are deeply grateful. Much of the support has come from the Jenessa Shapiro Undergraduate Research Scholarship. Jenessa and her husband, Noah

Goldstein, were graduate students at ASU and then faculty at the University of California, Los Angeles, where Jenessa studied stereotype threat, discrimination, and prejudice. After her untimely death, Noah made a generous donation to the ASU Department of Psychology to establish the scholarship fund, which has now grown, thanks to more than $80,000 in contributions from those who knew Jenessa and her work.

The Jenessa Shapiro Undergraduate Research Scholarship is awarded annually to two or three ENERGIZE students with demonstrated financial need. The scholarship allows those students to reduce their outside work hours so they can devote more time to research. So far, lab positions for four ENERGIZE students have been funded through the scholarship.

Another member of the ASU community made an unexpected and generous gift of $10,000 to further the aims of the ENERGIZE initiative. We plan to use some of these funds to provide an honorarium to the ENERGIZE graduate student coordinator who matches undergraduates with graduate student mentors. Some funds will also be used for the networking dinners and to support costs associated with ENERGIZE students' conference presentations.

By the time this article appears, we will have reached the end of the second year of ENERGIZE. Early signs suggest progress toward addressing unintended systemic racism within our own department, and we are beginning to think about how to share our success in this effort with other units at ASU as well as other psychology departments. At ASU, the number of labs participating with ENERGIZE student applicants is increasing. The number of donors is also increasing, thanks to a growing awareness of systemic racism in academia and willingness to fund efforts to support students underrepresented in psychological science. Yet although these numbers are encouraging, the most meaningful and important effect of the program is the impact of ENERGIZE on students.

During a recent department Zoom event, Arthur received a personal note in the chat from a student who we think encapsulates the program's success. It read: "Hi Dr. Glenberg! I just wanted to thank you for making the ENERGIZE project. Because of it I found Dr. Brewer, which led to me applying for my PhD, so I personally really appreciate it!"

This student was recently admitted into a graduate program. ●

Reference

Klein, E. (February 11, 2021). California is making liberals squirm. *The New York Times*. nytimes.com/2021/02/11/opinion/california-san-francisco-schools.html

BRINGING THERAPY CLOSER TO HOME

Telehealth during COVID-19 points to the digital future of mental healthcare

By Amanda F. Rose, Coda C. J. Derrig, Estee L. George, and Alan Gilbertson

In March 2020, the Department of Psychiatry & Behavioral Sciences at Cleveland Clinic Akron General Hospital joined other mental health care facilities and clinicians across the globe in adopting telehealth as a practical solution to the challenges imposed by the COVID-19 pandemic (Zhou et al., 2020). For 2 months, all psychiatry and psychology services were provided virtually or by telephone. Studies have shown that telehealth services are associated with improved appointment attendance and decreases in no-show and cancellation rates, given that patients can more readily access care (Fletcher et al., 2018; Snoswell et al., 2020; Silver et al., 2020). This was also our experience at Cleveland Clinic, where we see a diverse population of adult patients for both outpatient psychotherapy and psychiatric medication management.

As so many of our colleagues experienced, the transition required our providers to quickly gain competency in this new modality. Most of us had no prior experience providing telehealth services, and we wanted to avoid operating outside of our scope of practice; still, we were faced with the need to continue providing essential care to our patients while complying with the emergency order. Our psychologists, psychiatrists, and other practitioners worked together to quickly develop both short-term and long-term plans to address needed competencies in telehealth. We
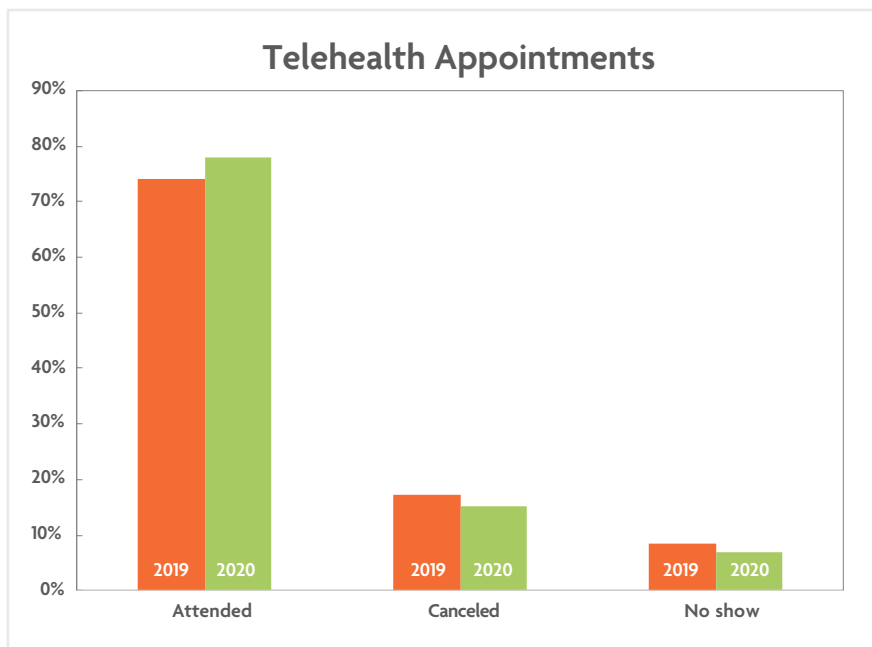
Total appointments during a two-month period at Cleveland Clinic remained stable from 2019 to 2020, at 5,056 and 4,988 patients respectively, but psychiatrists and psychiatric nurse practitioners experienced fewer no-shows and cancellations with the transition to telehealth during the pandemic.

created new consent forms for treatment and completed continuing education courses. Most of us found that our patients transitioned easily to telephone appointments on a temporary basis and then to a fully encrypted, HIPAA-compliant embedded virtual appointment interface. We appreciated that we could provide telehealth services quickly to our patients. During this time of rapid change, we also saw an opportunity to examine how this transition affected access to care.

Fewer no-shows

As a quality assurance initiative in our department, we examined changes in patients' attendance rates during two periods: before the pandemic, from April 1 through May 31, 2019, when only in-person visits were offered, and during the pandemic, from April 1 through May 31, 2020, when only virtual or telephone visits were offered. In April and May of 2019, 5,056 Cleveland Clinic appointments were

scheduled; 3,750 of those patients were seen, 876 cancelled, and 430 did not show up. In April and May of 2020, 4,988 patients were scheduled; of those, 3,893 were seen, 755 cancelled, and 340 did not show up to their appointments.

As demonstrated in the accompanying chart, our psychiatrists and psychiatric nurse practitioners experienced fewer no-shows and cancellations with the transition to telehealth visits during the pandemic. Interestingly, our psychologists and licensed counselors had fewer no-shows but more cancellations during this time.

Although these findings seem to lend credence to the theory that telehealth reduces no-show and cancellation rates, we must recognize that other factors not accounted for within the data may help to explain the findings.

For example, it is possible that more patients chose to keep their appointments because the pandemic led to increased anxiety and depression and, therefore, a more urgent need for psychiatric and psychological treatment. Ebrahimi and colleagues (2021) studied symptoms of anxiety and depression in adults during the COVID-19 pandemic. They found that rates were two to three times higher than during a period before the pandemic. Additionally, they noted that adults were worried about ➡
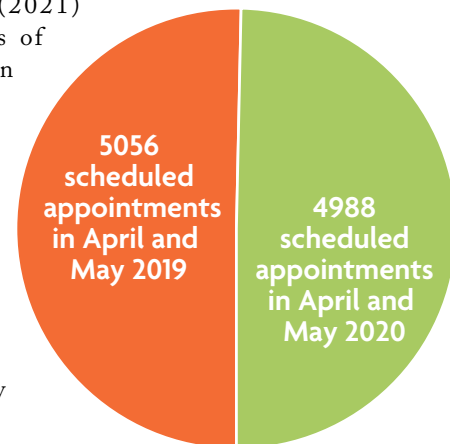
Amanda F. Rose (rosea@ccf.org) is a clinical psychologist at Cleveland Clinic Akron General and instructor of psychiatry at Northeast Ohio Medical University.

Coda C. J. Derrig (derrigc@ccf.org) is a clinical health psychologist at Cleveland Clinic Akron General and clinical assistant professor of psychiatry at Northeast Ohio Medical University.

Estee L. George (georgeE4@ccf.org) is a faculty member in the Department of Research at Cleveland Clinic Akron General and a clinical assistant professor of obstetrics and gynecology at Northeast Ohio Medical University.

Alan Gilbertson (agilbertson2@gmail.com) recently retired after serving as chief of psychology at Cleveland Clinic Akron General for over 25 years. He is a clinical professor of psychiatry at the Northeast Ohio Medical University.

the duration of social distancing requirements and reduced autonomy, which were also associated with increased symptoms (Ebrahimi et al., 2021).

Increased social isolation may have increased patients' desire to connect to others, and telehealth answered this need. In another study, adults who had previously been hospitalized for suicidal thinking or behaviors were assessed for suicidal ideation before and after the start of the pandemic. This study found a significant increase in suicidal thinking, which appeared to be related to increased social isolation. The researchers concluded that these findings highlighted the need for continued virtual mental health treatment during the pandemic (Fortgang et al., 2021).

It is also possible that layoffs and transitions to remote working during the pandemic freed up schedules and allowed more patients to keep their appointments. Additionally, telehealth can be completed in the home or at work, which eliminates the need for transportation and travel time and reduces the need to find alternative care for dependents (Sorenson, 2019).

A more virtual future

We were able to adapt quickly to the transition to telehealth services within our department

Clinical psychologist Amanda F. Rose at her telehealth station at Cleveland Clinic Akron General.

Other Findings on Virtual Mental Health Care

- In a survey of more than 2,000 psychology providers (American Psychological Association, April 23–May 6, 2020):
    - ° 76% indicated they provided only remote services to patients.
    - ° 16% offered both remote and in-person services, 3% saw patients only in person, and 5% suspended all services.
    - ° 55% of clinicians indicated that they treated fewer patients, whereas 15% said they treated more patients.

- Before the pandemic, Mace et al. (2018) surveyed 329 behavioral health organizations across the United States to better understand the use of telehealth for behavioral health services. The majority of respondents believed telehealth was important for improving access and quality of care for patients.
    - ° 48% reported using telehealth services. The most common modality was video conferencing (40%), followed by telephone (11%).
    - ° 78% of the behavioral health providers using telehealth were psychiatrists, 33% were mental health counselors, 24% were social workers, and 16% were psychologists.
    - ° Barriers to the implementation of telehealth services included lack of reimbursement, cost and maintenance of technology, education and training of professionals, and client-related barriers to services.

- A literature review by Fletcher et al. (2018) identified variations in attrition rates across studies on the use of virtual video visits among mental health care providers. Several studies demonstrated no significant differences, whereas others found that offering remote care increased adherence to treatment and reduced the number of missed mental health appointments.

- Silver et al. (2020) reported that the rate of missed appointments in an outpatient psychotherapy clinic decreased from 14.25% to 5.63% with the transition to telehealth services. The authors postulated that both psychological factors (e.g., greater need for human connection during mandatory stay-at-home orders) and logistical factors (e.g., ability of providers to initiate telephone appointments; reduction in barriers related to travel) may have contributed to the decrease.

- Numerous studies have shown that overall patient satisfaction with virtual visits is high. Notably, Fletcher et al. (2018) found that 84% of individuals who identified themselves as being "technologically naïve" indicated that receiving telepsychiatry services was as beneficial as attending in-person visits, and 98% of them said they would utilize these services again.

Clinical health psychologist Coda C. J. Derrig as she might appear to a patient receiving telehealth services from Cleveland Clinic Akron General.

and feel that the change benefited our patients. A survey of 119 of our psychiatric patients revealed that 64 (53.8%) preferred virtual visits to in-person visits, 19 (16%) did not prefer one over the other, and 36 (30.3%) preferred in-person visits (Fondriest et al., 2021). Other research has suggested that telehealth services may facilitate access to mental health care for those who may not otherwise have access (Fletcher et al., 2018; Silver et al., 2020). These services may also improve no-show and cancellation rates within outpatient settings, which has meaningful implications for both the delivery and the cost of care (Snoswell, 2020). We therefore believe that there is a need for policy change to ensure that providers will continue to offer remote mental health services and insurance companies will continue to reimburse for them.

Currently at the Cleveland Clinic, approximately 85% of behavioral health services are being provided virtually. Based on this it is projected that 50% of patients will continue to receive virtual care as we emerge from the COVID-19 pandemic; however, use of telehealth services will depend on patient preferences and continued reimbursement by insurers. As we have modified our environment and learned strategies for mitigating transmission of COVID-19, we have been able to resume some in-person services as of late April. Given our experience and the evidence supporting the benefits of telehealth services, particularly for access to mental health care, it is our intention to continue to provide this option to our patients going forward. COVID-19 has inflicted a great deal of pain and difficulty; however, we strive to demonstrate to our patients that great challenges present opportunities for growth. It is our hope that, through these new modalities, we can continue to provide greater access to mental health treatment. ●

References

American Psychiatric Association. (2020, June). *Psychiatrists use of telepsychiatry during COVID-19 public health emergency.* psychiatry.org/File%20Library/Psychiatrists/Practice/Telepsychiatry/APA-Telehealth-Survey-2020.pdf

American Psychological Association. (2020, June 5). *Psychologists embrace telehealth to prevent the spread of COVID-19: A survey of APA members reveals how the pandemic has impacted clinicians and their practices.* apaservices.org/practice/legal/technology/psychologists-embrace-telehealth

Ebrahimi, O. V., Hoffart, A., & Johnson, S. U. (2021). Physical distancing and mental health during the COVID-19 pandemic: Factors associated with psychological symptoms and adherence to pandemic mitigation strategies. *Clinical Psychological Science.* Advance online publication https://doi.org/10.1177/2167702621994545

Fletcher, T. L., Hogan, J. B., Keegan, F., Davis, M. L., Wassef, M., Day, S., & Lindsay, J. A. (2018). Recent advances in delivering mental health treatment via video to home. *Current Psychiatry Report,* 20(8):56. https://doi: 10.1007/s11920-018-0922-y

Fondriest, J., George, E., & Tampi, R. (2021). Assessing patient opinion of virtual psychiatric care [Unpublished manuscript]. Department of Psychiatry & Behavioral Sciences, Cleveland Clinic Akron General, Akron, OH.

Fortgang, R. G., Wang, S. B., & Millner, A. J. (2021). Increase in suicidal thinking during COVID-19. *Clinical Psychological Science.* Advance online publication. https://doi.org/10.1177/2167702621993857

Mace, S., Boccanelli, A., & Dormond, M. (2018). The use of telehealth within behavioral health settings: Utilizations, opportunities, and challenges. University of Michigan Behavioral Health Work Force Research Center. behavioralhealthworkforce.org/wp-content/uploads/2020/03/Telehealth-Full-Paper_3.3.2020.pdf

Silver, Z., Coger, M., Barr, S., & Drill, R. (2020). Psychotherapy at a public hospital in the time of COVID-19: Telehealth and implications for practice. *Counselling Psychology Quarterly*, 1-9. https://doi.org/10.1080/09515070.2020.1777390

Snoswell, C. L., & Comans, T. A. (2020). Does the choice between a telehealth and an in-person appointment change patient attendance? *Telemedicine and e-Health.* Advance online publication. https://doi.org/10.1089/tmj.2020.0176

Sorenson, G. (2019, August 25). *Reducing no-shows with virtual healthcare.* GlobalMed. globalmed.com/reducing-no-shows-with-virtual-healthcare/

Zhou, X., Snoswell, C.L., Harding, L. E., Bambling, M., Edirippulige, S., Bai, X., & Smith, A. C. (2020). The role of telehealth in reducing the mental health burden from COVID-19. *Telemedicine Journal and e-Health,* 26(4):377-379. https://doi.org/10.1089/tmj.2020.0068
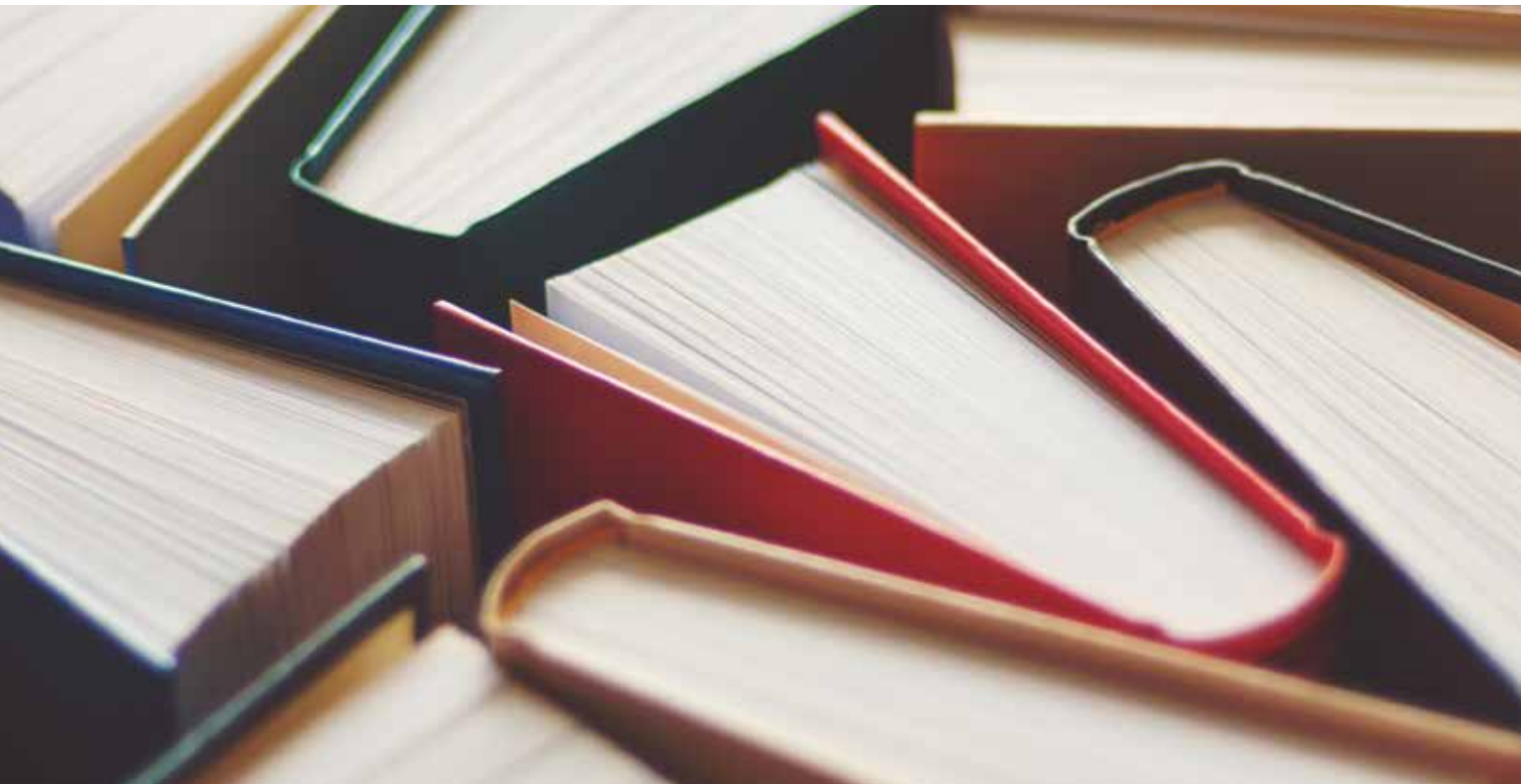
IT'S NOT QUITE A LIVING

But writing books can integrate research and theory—and can be remarkably satisfying. A psychological scientist looks back at 50 years.

By Stephen K. Reed

This year marks my 50th anniversary of writing academic books while also pursuing my career as a researcher and professor. Fifteen books later (including new editions), I sat down to capture a few of my experiences that I believe illustrate some key guidelines that all authors may wish to consider when heading into book writing. Although all of my books are associated with cognitive psychology, I believe my experiences are relevant to writing books on any topic.

Making connections

I began writing my first book, *Psychological Processes in Pattern Recognition,* in 1971 while a postdoctoral fellow at the University of Sussex in Brighton, England. Many psychologists consider Ulric Neisser's (1967) classic book, *Cognitive Psychology,* to be the first book to bring together research and theories about the information-processing approach to psychology. The goal of my book, published in 1973, was to continue that theme through chapters on the representation of patterns, perceptual stages, memory codes,

categorization, and response selection. The book appeared in the Academic Press Series in Cognition and Perception. I was fortunate that my graduate school advisors, Mort Friedman and Ed Carterette, were the editors of the series.

Shortly after the book's publication, I made a critical connection while attending a conference. A young man named Larry Erlbaum congratulated me on the book and informed me that he had served as an editor on it before leaving Academic Press to start his own company. Lawrence Erlbaum Associates went on to become a leading publisher of books on psychology, including my third book, *Word Problems: Research and Curriculum Reform*.

Similar connections furthered my later success in publishing books. For instance, one of the courses I taught during this period was on cognitive psychology. Few textbooks were available on the topic at the time. I used Neisser's (1967) *Cognitive Psychology*, which was very readable but lacked coverage of memory and higher cognitive processes. I therefore began writing a cognition textbook

in 1979 as a visiting associate professor at the University of California, Berkeley. The Berkeley faculty were very supportive. The Graduate Group in Science and Mathematics Education provided financial support and loaned me the office of Professor Birge, the retired chairman of the Physics Department, in Birge Hall. Leo Postman encouraged me to use the excellent library at the Institute of Human Learning. George Lakoff read a draft of the first three chapters and explained how metaphors supported cognitive constructs.

Others reported to C. Deborah Laughton that I was writing a textbook. Deborah was a psychology editor at Brooks/Cole and became my guide during the book's publication. *Cognition: Theory and Applications* (Reed, 1982) consisted of 14 chapters divided into three parts on information-processing stages, the representation and organization of knowledge, and complex cognitive skills. Its 10th edition is expected to be published next year.

My goal in writing *Word Problems: Research and Curriculum Reform* (Reed, 1999) was to use word problems as a focus for integrating research and theory in the fields of cognitive psychology, mathematics education, and instructional technology. I had noticed that there was extensive research on word problems by both cognitive psychologists and mathematics educators but a lack of cross-reference between these two fields. As a member of the Center for Research in Mathematics and Science Education at San Diego State University, I was easily able to track the research of my colleagues and others in mathematics education. The book appeared in the Studies in Mathematical Thinking and Learning Series, published by Lawrence Erlbaum Associates.

Thinking visually

My book *Thinking Visually* (Reed, 2010) united two of my interests—visual cognition and problem solving—that had prominent roles in my three previous books. Its publisher, Taylor & Francis, had acquired Lawrence Erlbaum Associates in 2006. The book covers a variety of topics related to visual thinking, such as imagery, estimation, spatial metaphors, pictures, diagrams, graphs, virtual reality, science instructional software, and mathematics instructional software.

A cognitive skill that I lack, however, is the ability to predict the impact of my articles and books. Neither the sales nor the citations for the first edition of *Thinking Visually* met my high expectations. I was therefore surprised when an editor at Taylor & Francis asked me whether I would be interested in writing a second edition. She informed me that the publisher thought the timing was right for a new edition, which meant a new cover. I have made a
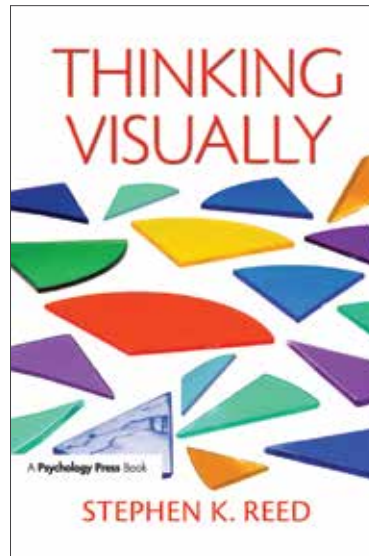
The first edition of *Thinking Visually* (2010) had only black-and-white images on the inside pages.
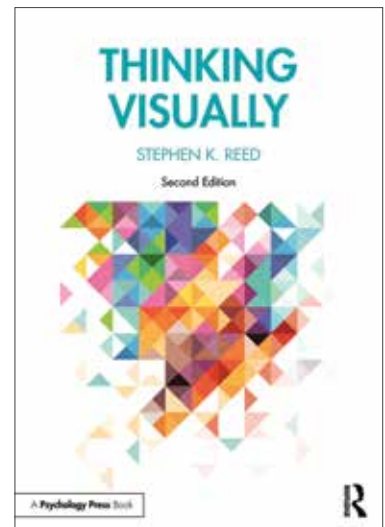
number of these decisions over the years, usually by selecting a preference among four covers designed by the publisher. My favorite cover was the first edition of *Thinking Visually*.

One of the reviewers wrote that the revision itself should be broader to match the colorful cover of the first edition. The criticism was justified, so the second edition covers a wider range of topics, including aesthetics, visual narratives, communication of health risks, dreams, clinical imagery, mathematical games, and the influence of action on perception. It concludes with a chapter on mixed reality to showcase the many exciting developments in this area.

Another helpful assist from my publisher was producing the new edition in full color, which was particularly noteworthy for a book on visual thinking. Both editions include a photo of Frank Lloyd Wright's magnificent Fallingwater house. You can imagine the contrast between the black-and-white photo in the first edition and the color photo in the second edition.

I also attempted to select some photos that would make readers smile. An opportunity occurred when I summarized a study by Steve Palmer and his colleagues on color preferences (Palmer & Schloss, 2010; ➡

The 2021 edition has a new cover and full-color images, at the suggestion of Reed's publisher.

Stephen Reed is a professor emeritus at San Diego State University and a visiting scholar at the University of California, San Diego. He writes articles and books that integrate topics in psychology.

Palmer, Schloss, & Sammartino, 2013). Their findings indicated that people like colors that are strongly associated with objects they like and dislike colors that are strongly associated with objects they dislike. The results even applied to social institutions. For undergraduates at the University of California, Berkeley, "school spirit" correlated positively with preference for Berkeley's blue and gold colors and negatively with preferences for the red and white of archrival Stanford. The inverse pattern occurred for Stanford undergraduates. So what happens on game day when your father is a Cal-Berkeley graduate and your mother is a Stanford fan? If you are diplomatic, you wear a Califord dress. The photo makes me smile, but grandparents are biased, so you will have to judge for yourself.

To summarize a study on color preferences in the 2021 edition of *Thinking Visually,* Reed selected a photo of his granddaughter in a dress featuring the colors of her parents' favorite opposing teams.

Marketing and royalties

Needless to say, the goal of most publishers is to sell books. The Internet has had a dramatic impact on book marketing and, in some ways, on author responsibility. Amazon's "Look Inside" option, for example, enables viewers to browse by seeing portions of a book's content. I thought I could improve that content for *Cognitive Skills You Need for the 21st Century* (Reed, 2020s) but discovered that third-party sellers like Amazon use algorithms to generate the content automatically. Publishers, however, can control how much content is available to customers. The default setting for Amazon is 20%, with a permissible range between 10% and 80%. (I defer to my publishers' marketing departments on these percentages.)

After I completed the manuscript for *Cognitive Skills You Need for the 21st Century* (Reed, 2020a), my editor at

Oxford University Press asked me to write a summary for each of the chapters. I protested that there were 20 chapters, but she informed me that the summaries were required to help Internet searches locate the book.

Relatedly, the marketing department at Oxford encouraged me to contribute to OUPblog, which contains content related to authors' books, including a link for purchasing the book in a sidebar. (You can find my post, "How to Prepare Students for Jobs in the 21st Century," at blog. oup.com/2020/08/how-to-prepare-students-for-jobs-in-the-21st-century/.)

I do not advise scholars to write books because they wish to become wealthy. Author royalties typically range from 10% to 15% of a publisher's net income for a book. Textbooks are the most likely books to generate income because they usually generate more sales and cost more than other scholarly books.

Nonetheless, supplemental income from my textbook sales had a positive impact on our family finances when my wife and I were raising a family. We no longer require that, so I donate all of my royalties to academic needs, particularly travel funds for students, so they can present their ideas at conferences. Students are the primary source of royalties, so they should be the primary beneficiaries.

Contributors

I have referred to these books as *my* books for simplicity, but this isn't entirely accurate. Writing a book is a group project, so *our* books is a more accurate description. The group includes family, friends, acquisition editors, content editors, reviewers, a production team, and a marketing team. It may include contributing authors and coauthors, too.

Contributing authors enhance the content of books, particularly when they possess expertise the author lacks. A recurring theme throughout the various editions of my textbook *Cognition: Theory and Applications* has been reviewers' requests for more neuroscience. Paul Merritt joined me as a contributing author on the 10th edition (Reed, 2022) to enhance the neuroscience content.

Paul also brought a new perspective because the majority of students in his cognitive psychology courses at Georgetown and Colorado State University were not psychology majors. I decided to make the new edition more user-friendly to nonmajors by eliminating material that now appeared too complex to me. I also added a section on applications to the end of each chapter. Although the earlier editions of the textbook had discussed both topics, there had been much more emphasis on theory than on applications.

Coauthors also provide added expertise and share the workload. I have never had a coauthor on a book but found them invaluable when writing integrative journal articles (Reed, 2020b). My colleague Tom Carey and I have had
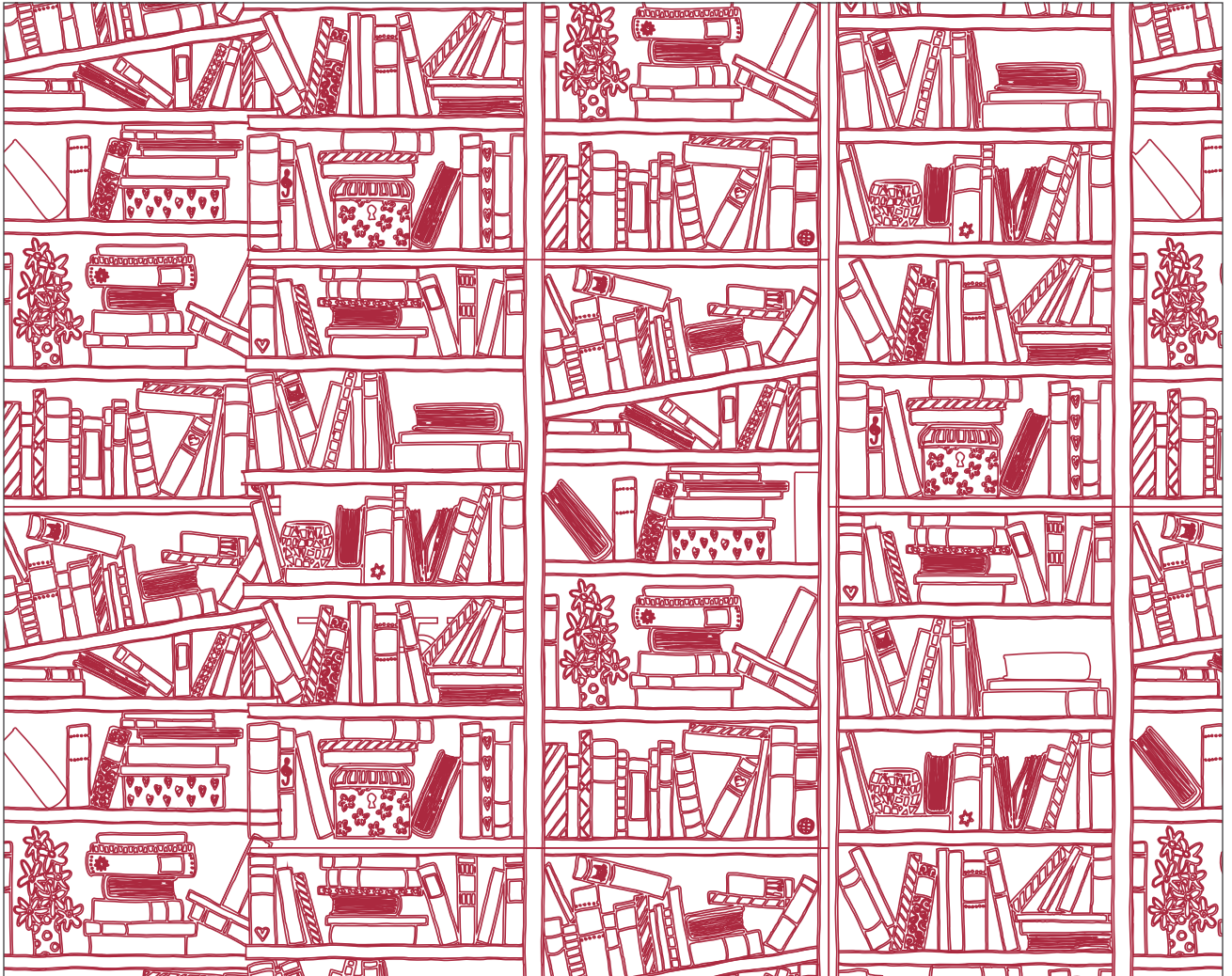
many discussions regarding how to encourage innovation by integrating research from cognitive scientists, educators, and organizational specialists. Tom's current projects include advising on the design of innovation curricula in Oklahoma, Toronto, Vancouver, and Brisbane. We decided to coauthor a book on innovation. It will be a new adventure for both of us, and I like new adventures. ⊙

References

Neisser, U. (1967). *Cognitive psychology*. Appleton-Century-Crofts.

Palmer, S. E., & Schloss, K. B. (2010). An ecological valence theory of human color preference. *Proceedings of the National Academy of Sciences, USA, 107*(19), 8877–8882. https://doi.org/10.1073/pnas.0906172107

Palmer, S. E., Schloss, K. B., & Sammartino, J. (2013). Visual aesthetics and human preference. *Annual Review of Psychology, 64*, 77–107. https://doi.org/10.1146/annurev-psych-120710-100504

Reed, S. K. (1973). *Psychological processes in pattern recognition*. Academic Press.

Reed, S. K. (1982). *Cognition: Theory and applications*. Brooks/Cole.

Reed, S. K. (1999). *Word problems: Research and curriculum reform*. Erlbaum.

Reed, S. K. (2010). *Thinking visually*. Taylor & Francis.

Reed, S. K. (2020a) *Cognitive skills you need for the 21st century*. Oxford University Press.

Reed, S. K. (2020b). Searching for the big pictures. *Perspectives on Psychological Science, 15*(3), 817–830.

Reed, S. K. (2021). *Thinking visually* (2nd ed.). Taylor & Francis.

Reed, S. K. (2022). *Cognition: Theory and applications* (10th ed.). SAGE.

UP-AND-COMING VOICES: THE FUTURE OF WORK

Poster presentations offer student and early-career researchers an invaluable opportunity to connect with colleagues and present their work to the broader scientific community. With many such events still taking place online, including the recent 2021 APS Virtual Convention, this *Observer* feature provides early-career participants in the APS Virtual Poster Showcase with another platform to share their research. This edition spotlights a selection of research related to the changing workplace from the 2020 Virtual Poster Showcase.

#ArmMeWith: Analyzing Teacher Resource Needs Through Twitter

Christina Naegeli Costa, Nansook Park, and Mari Kira (University of Michigan, USA)

What drew you to this research?

As a former teacher, I am drawn to research on teacher well-being because I know firsthand how difficult and demanding, yet underappreciated, the profession can be. I am also drawn to social media methods because we can access so much information in such a short amount of time. It would have taken many more resources to get the same amount of feedback from teachers if we were doing survey research with this particular study. Instead, we were able to examine 2,639 tweets from the #ArmMeWith Twitter campaign.

What did the research reveal that you didn't already know?

The most interesting thing we found in this particular study was factors of well-being that have not been traditionally considered in occupational well-being models. For example, we found that teachers' need for political change, physical building characteristics, and safety were all factors. We are working now on follow-up research to measure these factors and see how they relate to teacher well-being.

Differences in Vocational Interests and Personality Between Occupational Groups

Linda Berga, Inese Muzikante, and Ivars Austers (University of Latvia)

What drew you to this research?

During the summer of 2018, a leading telecommunications company in Latvia was looking to answer the question of which employees should be reskilled for future jobs. We started to wonder what besides cognitive ability can predict a person's willingness and efficiency to reskill for professions on the rise, such as chatbot trainers. In Latvia, there is no valid assessment tool available for vocational interests. Based on the research done in other countries and the theory of vocational personalities and work environments by J. L. Holland, we were able to develop an instrument—the Latvian Questionnaire of Vocational Interests—that fits Latvian employees and their vocational interests.

This project led to the research question of whether employees in different occupations differ in their vocational interests. We wanted to understand the best fit

Bold type indicates authors of response

for a job, based on an employee's vocational interests and personality, and whether these characteristics can predict their job performance beyond cognitive ability.

What did the research reveal that you didn't already know?

The research revealed how similar the vocational interests of people working as client specialists, sales specialists, and managers are, and how different those interests are from the interests of people working in IT or business analysis. Investigative interests were significantly higher in the business analysis group, and conventional interests (a preference for working in structured environments) were significantly higher for client and sales specialists when age and gender were controlled for. Another interesting finding was that we can use these vocational interests to predict job performance even when the employees made their education and career choices years ago.

Finally, we found that there were no differences in vocational personality if age and gender were controlled for. We could not say from our data that managers who are doing their jobs well and IT specialists who are doing their jobs well, for example, are different in broad personality traits as occupational groups. Yet the sample size does not allow us to generalize our research findings outside the organizations where the study was conducted.

Idea Championing, or Whom and How? The Interactive Effects of Leader Characteristics and Idea Championing on Employee Idea Implementation

*Eun Soo Son and Andreas Richter (University of Cambridge, England)*

What drew you to this research?

"A new idea either finds a champion or dies," said Donald A. Schon (1963). Although there is a burgeoning need for novel and useful ideas in today's ever-more-challenging business environment, employees often face difficulties in single-handedly pushing their creative ideas forward to implementation. I had similar experiences, yet I eventually saw my ideas come to fruition with kind support from my advisor, family, and friends. Hence, I wanted to examine this situation in the context of real organizations. I was interested in examining how others, especially team leaders or line managers, could play a role in the execution of their direct reports' creative ideas.

What did the research reveal that you didn't already know?

Our study revealed that the success of a leader's idea championing, in terms of improving the odds of an employee's idea implementation, depends on two leader characteristics: political influencing behavior and organizational status. We also found that, although only political behavior moderated the relationship between the effectiveness of a leader's peer-level idea championing and employee idea implementation, both political behavior and status separately moderated the relationship between leader's idea championing and top-management-level and employee idea implementation.

Peer leaders as well as top managers rewarded active idea championing by team leaders who were passive in their political behavior, increasing the chances of their team members' ideas being implemented. Peer leaders penalized active idea championing by highly political team leaders, indicating the detrimental effects of excessive influence activities. But top managers seemed less concerned and did not penalize such actions. ➡
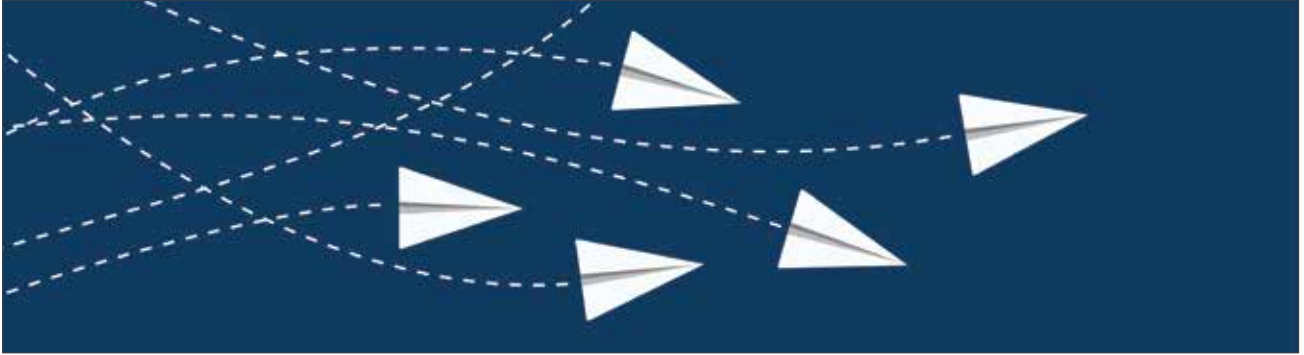
Is Self-Efficacy Good for Decision-Making? Decision-Making Self-Efficacy Increases Regret Through Decision-Making Styles

Shin-I Shih and An Hoang Kim Vo (National Sun Yat-sen University, Taiwan)

What drew you to this research?

I noticed that people react differently after they have made decisions—some people feel good about their decisions, while others don't—even when the feedback on the decision outcomes is not immediately available. Among all the discrete emotions, regret has attracted a considerable amount of scholarly attention and is frequently experienced in the decision-making process. Therefore, I used regret to represent the negative emotions experienced after decision-making and tried to identify factors that can help explain the variability in people's negative feelings after making decisions.

What did the research reveal that you didn't already know?

First, extant research has emphasized the positive effect of self-efficacy on human performance, but its potential negative effects have been relatively understudied. Our results showed that people with a higher level of decision-making self-efficacy (DMSE) tend to experience a greater level of regret after making decisions. Given that high-DMSE individuals are desirable hires in organizations for having better productivity and learning ability, employers should pay attention to their emotional well-being, especially when they are placed in positions with greater decision-making capabilities.

Second, this study shed light on the relationship between decision styles and decision-making-related emotions. In the extant research on decision styles, rational style is considered a "good" style, while avoidant style is considered a "bad" style that leads to undesirable decision consequences. However, our study shows that people adopting greater levels of rational style tend to experience greater levels of regret, and people who employed avoidant style experienced lower levels of regret. Seeing that rationality and critical thinking are the cornerstones of higher education, working professionals might be the group that are more susceptible to greater levels of regret. Therefore, it is important for organizations to provide training or counseling to mitigate the negative effects of rational decision-making.

Relative Contribution of Organizational Climate Perceptions on Burnout and Job-Attitudes Among STEM Women Faculty

Sheng Zhang and Mahima Saxena (Illinois Institute of Technology, USA)

What drew you to this research?

Science, technology, engineering, and mathematics (STEM) fields have unique characteristics (e.g., male-dominated workforces and "boy's clubs") that may put women employees in disadvantaged positions. This is relevant for gender-related unequitable outcomes typically seen in STEM education and workplaces. As organizational psychologists, we were curious about the specific challenges that women in STEM face, causing additional strain above and beyond regular job demands at the workplace. Inspired by my advisor and collaborator, Dr. Mahima Saxena, we conducted this research to examine the impact of three organizational characteristics specific to the STEM fields: stereotype threat, workplace

incivility, and STEM identification. Our sample was women faculty in university STEM departments. Moreover, we employed relative weight analysis to examine the relative contribution of these STEM-specific characteristics on burnout and job attitudes.

What did the research reveal that you didn't already know?

Our results indicated that these STEM-specific characteristics moderately predicted burnout and job attitudes among STEM women faculty. In other words, these are meaningful outcomes. This has applications for university administration and policymakers—in addition to emphasizing greater representation and retention of women in STEM departments, they should investigate how on-the-ground STEM-specific characteristics in the department can contribute to women faculty's well-being. Moreover, relative weight analysis captured the relative contribution of each predictor; this is important statistically, as they are highly correlated. Our results suggest the dominant role of STEM identification among the three STEM-specific characteristics listed above. These results suggest that it is important for universities to create a culture that is welcoming to STEM women and to facilitate their identification with the broader field. Our study serves as a critical first step to examine the impact of these STEM-specific characteristics from an organizational psychology perspective, serving as a key impetus for future research.

Workplace Aggression and Employee Role Behaviors: Mediation of Multiple Emotions

Sobia Nasir (Superior University, Pakistan) and Ozge Can (Yasar University, Turkey)

What drew you to this research?

I was drawn to the idea of studying workplace aggression when I confronted related challenges during the initial phases of my academic career. In my country, as a part of its honor culture, gender discrimination and aggressive attitudes toward those who are not seen as equals remain strong. In the past, I tried to withdraw from these scenarios, only to find the aggression even worse when the issues returned. My curiosity to know more about the mechanisms of such misconduct inspired me to choose my dissertation topic on understanding different workplace aggression profiles (e.g., whether the modality aggression is verbal or physical, information about the perpetrator, who else is involved) and how they influence target employees through multiple emotions. In this project, I was able to combine my research aspirations with my passion for seeing things from a broader perspective regarding cultural challenges, respect, employee rights, and well-being. In this journey, I have discovered that the more basic a question is, the more astonishing the answer can be.

What did the research reveal that you didn't already know?

Our inclusive model and empirical testing delivered multiple insights into existing research. First, our study revealed that there are different channels through which aggression manifests itself in work life. Those mechanisms emerge as unique combinations of several individual and relational factors. We also found that being exposed to aggression instigates several diverse emotional reactions beyond anger and sadness.

Finally, our research is a rare example of workplace aggression being examined comprehensively in the context of a non-Western, developing country. These insights can motivate other researchers to do more on the topic. Questions for future studies could include how such aggression events can be prevented, or at least reduced, and how employees might cope with them to decrease the negative effects. ●

Recognizing Excellence
Call For Nominations

2023 APS William James Fellow Award

Honoring APS Members for their lifetime of significant intellectual contributions to the basic science of psychology.
Nomination Deadline: October 15, 2021

2023 APS James McKeen Cattell Fellow Award

Honoring APS Members for their lifetime of significant intellectual achievements in applied psychological research and their impact on a critical problem in society at large.
Nomination Deadline: October 15, 2021

2023 APS Mentor Award

Recognizing APS Members who have significantly fostered the careers of others, honoring those who masterfully help students and others find their own voices and discover their own research and career goals.
Nomination Deadline: October 15, 2021

2023 APS James S. Jackson Lifetime Achievement Award

Honoring APS Members for their lifetime of outstanding psychological research that advances understanding of historically disadvantaged racial and ethnic groups and/or understanding of the psychological and societal benefits of racial/ethnic diversity, equity, and inclusion.
Nomination Deadline: October 15, 2021

APS honors Members with the field's most prestigious awards and recognitions. This is a critical part of supporting scientific advances. **Please consider the diverse and international nature of psychological science in nominating colleagues. Nominations of members of underrepresented groups in the field are encouraged.**

2022 APS Janet Taylor Spence Award
For Transformative Early-Career Contributions

Recognizing transformative early-career contributions to psychological science. Award recipients are APS Members who reflect the best of the many new and cutting-edge ideas from our most creative and promising investigators.

Nomination Deadline: September 15, 2021

APS Fellows

Fellow status is awarded to APS Members who have made sustained outstanding contributions to the science of psychology in the areas of research, teaching, service, and/or application.

Nomination Deadline: October 15, 2021

APS Rising Stars

The Rising Star designation recognizes outstanding APS Members in the earliest stages of their post-PhD research careers whose innovative work has already advanced the field and signals great potential for their continued contributions.

Nomination Deadline: September 30, 2021

To submit a nomination or for more information, including past recipients and nomination materials, please visit **www.psychologicalscience.org/awards**

aps | ASSOCIATION FOR PSYCHOLOGICAL SCIENCE

www.psychologicalscience.org/awards

THE 2020 AND 2021 APS LIFETIME ACHIEVEMENT AWARDS

Always a highlight of the APS Annual Convention, the traditional presentation of Lifetime Achievement Awards was forced to pivot in the pandemic years of 2020, when the convention was cancelled, and 2021, with APS's first-ever "virtual" convention. All 21 recipients of the 2020 and 2021 APS Lifetime Achievement Awards delivered their remarks by video, sharing their science and professional journeys for others to enjoy online at any time.

The following pages feature a brief excerpt of each recipient's remarks. Some excerpts have been lightly edited. Lisa Feldman Barrett (APS President 2019–2020) of Northeastern University introduced the 2020 recipients. Shinobu Kitayama (APS President 2020–2021) of the University of Michigan introduced the 2021 recipients.

View all APS Awards videos, and learn about previous recipients of the awards program, by visiting psychological science.org/awards. You can also see the videos on the APS YouTube channel.

2020 APS William James Fellow Award

Honors APS members for their lifetime of significant intellectual contributions to the basic science of psychology.

Neil Burgess

University College London, UK
Neural Mechanisms of Spatial Memory and Cognition

I've always been interested in memory, and in understanding how it results from the firing of neurons via computational modelling. I'm also interested in spatial cognition, which allows a cross-species approach, with similar tasks in rodents and humans.... We've taken insights from rodent electrophysiology to form a neural-level understanding of human spatial memory.... It's possible that place [neurons whose firing is influenced by visual inputs] and grid cells [neurons whose firing is influenced by self-motion] form a system for much more than spatial memory, in which place cells represent states or concepts in arbitrary problem spaces and grid cells represent the vectors between them, capturing either transition statistics or relational knowledge and allowing navigation within these conceptual spaces."

Carol S. Dweck

Stanford University, USA
Mindsets and Opportunities in My
Life and Work

We used to mock researchers for studying what they were bad at—you know, the forgetful person who studied memory, the totally impulsive person who studied self-control—but I was determined to get to the bottom of my own question. Why do some people shy away from challenges and wilt in the face of obstacles, while others equally able—no more able—go for it? When I embarked on this research, first studying it in children, I was fascinated by their starkly different reactions when they encountered hard problems in our experiments. Some children indeed wilted, but others seemed undaunted or even delighted. I'll never forget the 10-year-old boy given problems he couldn't solve who rubbed his hands together, smacked his lips and said, 'I love a challenge.' Then and there, I made a vow to learn their secret, to bottle it, and to distribute it widely—and, by the way, to take a few healthy swigs of it myself."

Susan A. Gelman

University of Michigan, USA
What Children Can Teach Us About
Concepts

This terrible year provides a backdrop for a question that has motivated my research throughout my career, namely, how and why do we form the categories that we do? What do categories do for us? We know from decades of psychological research that every organism, from mealworm to chimp, organizes experience into categories. The textbooks tell us that this increases efficiency. Rather than track every individual we encounter, we have summary mental representations that allow us to efficiently access what we know. But human categories do much

Carol Dweck's research demonstrates the power of a growth mindset to enhance learning, especially for struggling students.

more than just sort facts into file folders. I propose that for humans, a category is more like a miniature theory."

Andrew N. Meltzoff

University of Washington, USA
Imitation as a Vehicle for Social Learning: Theoretical Advances

Based on the behavioral results of infant imitation and newer neuroscience studies, I have advanced a theoretical view called the 'Like-Me' hypothesis. I propose that young infants, even before spoken language, can detect the equivalences between self and other and make the judgment that other people are 'like me.' I think this has deep implications for the development of social cognition. For instance, it may support infant behavioral imitation, engender the basic feelings of interpersonal connectedness between infants and adults, and underlie the development of empathy, perspective-taking, and other aspects of more mature social cognition."

2020 APS James Mckeen Cattell Fellow Award

Honors APS members for their lifetime of significant intellectual achievements in applied psychological research and their impact on a critical problem in society at large. ➡

Thomas E. Joiner

Florida State University, USA
The Interpersonal Theory of Suicide

There has been an understandable yearning in clinical circles for prediction. I'm a clinician myself in addition to being a scientist and scholar. Clinical work's an important part of the professional life, and I know for sure that the knowledge of who will die, when they will die, how they will die, would be very reassuring to know, not to mention life-saving for hundreds of thousands of people. And yet, prediction is just not where the state of the art is in our science. Moreover, there's no need for high predictive power in order to achieve significant explanatory reach. In fact, that's the status quo in a number of research areas having to do with health. Heart attacks, for instance. We don't know very much really about the who, when, and even the details of how with heart attacks. Strokes are another example.… Nevertheless, we understand a lot about these conditions, and we know what to do to improve them."

Richard M. Lerner

Tufts University, USA
Promoting Positive Youth Development: Plasticity, Specificity, Non-Ergodicity, and Contributions to Social Justice Among Global Youth

Three concepts that I'm going to be explaining are plasticity, or the potential for systematic change across the lifespan; specificity, the idea that each person has characteristics of individuality that make him or her distinct; and then a complex concept called non-ergodicity.… It's basically the idea that we don't want to use averages across groups to try to represent the specific attributes of any individual young person.… When I finish talking about these three concepts I will be in a position to talk about how we can use psychological scholarship to promote

Toni Antonucci's research focuses on social relations and health across the life span, including multigenerational studies of the family.

positive development and social justice.… All youth have strengths, and all contexts within which you live and work and develop have resources that—if we're smart enough—we can align with young people's strengths [to] promote their positive youth development."

2020 APS Mentor Award

Recognizes APS members who have significantly fostered the careers of others, honoring those who masterfully help students and others find their own voices and discover their own research and career goals.

Toni C. Antonucci

University of Michigan, USA

Their career goals are not your career goals, and you really need to help folks that you want to mentor discover what's important to them, and so often I start with that question. What's important to you? … What's the topic you went to graduate school for? Almost always people have an answer to that question.… If they don't have an answer, then you might have to work a little harder to get people to think about why they ever decided to go into graduate school… [T]hen my biggest struggle is to be sure not to impose my view of their topic on them…, I try to set up a dialogue that … provides a freedom to say anything they want."

Elizabeth Ligon Bjork and Robert A. Bjork

University of California, Los Angeles, USA

Elizabeth: "Make sure that the person you're thinking about working with is somebody who is actually interested in the same issues you are—at least in a broad way. We've both had students who are very interested in an aspect of human learning and memory that we had not worked on or knew much about, and they

have really inspired us to broaden our perspective and gain new interests. And then I think you want an advisor who really has your best interest at heart and is very interested in promoting your career and advancing your knowledge and success rather than someone who is kind of using you as a way to increase their own success and glory."

Bob: "One thing we advise our own undergraduate students who are going off to graduate programs is to be sure to talk with the graduate students or postdoctoral fellows who are already at that place. What's it like to be there? What's the level of interaction? They'll always tend to get an honest reply because the students answering such questions don't want to have a new student show up and then ask them why they said that when something else is true. It's an especially valuable thing to do because, while we—for example—have close relationships with a number of our colleagues, we are not supervised by them."

E. Tory Higgins

Columbia University, USA

I think it is important for faculty mentors to understand that they have a responsibility to their mentees in the mentor-mentee relationship that is different from the mentees' responsibility to them. Yes, the research collaboration is a 'we' project with the student taking the lead, but students can need help in their careers that only faculty can provide given faculty's greater organizational power. Faculty mentors need to provide their mentees with the professional help they need to build their careers. With greater power comes greater responsibility. The research collaboration may be equal, with the mentee even being given higher status as the leader of the 'we' project, but the responsibility for your research partner's career is greater for the mentor."

2021 APS William James Fellow Award
Honors APS members for their lifetime of significant intellectual contributions to the basic science of psychology.

Michelene (Micki) Chi
Arizona State University, USA
How Students Learn

My work has always been about learning, in particular learning of authentic new information … versus arbitrary sentences.… One effective way to learn is for students to explain [instructional materials] to themselves—self-explaining is what I call it. It is a way of generating inferences from prior knowledge and connecting new information presented in the learning materials with prior knowledge.… Potentially the most effective way to learn is collaboratively by interacting with a peer, but the way of interacting is crucial. To be beneficial, collaborators must interact with a peer in a co-constructive or co-generative way.… The advantage of collaboration is not the availability of complementary knowledge (some of the prevailing views suggest that) but [rather] building on partners' inferences, resulting in knowledge that neither partner could create on their own."

Dante Cicchetti
University of Minnesota, USA
Career Pathways: Past, Present, and Future

My initial vision for developmental psychopathology was for it to become a science that not only bridged fields of study and aided in the discovery of important new truths about the processes underlying adaptation and maladaptation across the life course, but also provided the best means of pre- ➡

venting and ameliorating maladaptive and pathological outcomes. Moreover, the field of developmental psychopathology should continuously seek to reduce the dualisms that exist between empirical research and the clinical study and treatment of childhood and adult high-risk conditions and mental disorders, between the behavioral and biological sciences, and between basic and applied research."

Nancy Kanwisher

Massachusetts Institute of Technology, USA
Functional Imaging of the Human Brain: A Window into the Organization of the Human Mind

I know some consider it controversial to claim that some cortical regions carry out very specific mental functions, but actually the evidence is overwhelming.… When we get the rare privilege of directly recording actual neural responses from electrodes in the brains of human neurosurgery patients … we see nearly exclusive responses to faces in intracranial recordings.… Studies of patients with intracranial electrodes have also enabled us to conduct our strongest causal tests.… I'm not claiming that all patches of the cortex are functionally specific.… I'm also not claiming that any of these regions act alone.… We still have a huge space of unanswered questions about the computations, interactions, and developmental and evolutionary origins of these [brain] regions."

James W. Pennebaker

University of Texas at Austin, USA
Analyzing Words: Personality, Thinking Styles, and Behavior

Over the years, we discovered that the words people use in everyday life really reflect who they are, how they think, how they connect with others. By analyzing language, we can tell if someone is telling the truth or

Dante Cicchetti's research recognizes the multifaceted nature of mental illness and has laid the foundation for the field of developmental psychopathology.

lying, if they are high status or low status, if they're males or are females, what their personality is, etc. In the last five or ten years we've expanded this in a way … that I would have I would have never imagined, which is using big data methods, working with people in computer science as well as psychology and other disciplines.… In other words, here's a new way to start thinking about people and how they're connected and enmeshed with people throughout their social network."

2021 APS James McKeen Cattell Fellow Award

Honors APS members for their lifetime of significant intellectual achievements in applied psychological research and their impact on a critical problem in society at large.

Alison Gopnik

University of California, Berkeley, USA
Three Ages and Three Intelligences: Explore, Exploit, Care

Almost all the work on intelligence and cognition has focused on prime-of-life adults. We're just beginning to understand a special kind of intelligence, the kind that comes with elders … focused on caring for other people, passing on information to a new generation rather than maximizing resources. I sometimes say we're really at our most human before puberty and after menopause. It's then that the most human capacities—for broad exploration, for cultural transmission—are at their peak. We do this a bit as adults, but we're too preoccupied with finding our way in the hierarchy and getting resources and mates.… I think if we pay more attention to … children and elders, we might learn some really deep things about how the human cognition works."

Megan Gunnar

University of Minnesota, USA

When You Are Wrong Is Often More Important Than When You Are Right

Just about the time I was finally hitting paydirt on the role of attachment figures in regulating children's stress biology, another completely baffling set of results landed in the lab.... Cortisol should decrease across the day, but in full-day child care, it was going up.... What became clear is that the quality of care predicted how much of a rise in cortisol child care produced. But it did not answer the key question: Does it matter? Over and above child-care quality, are these elevations in cortisol every day the child is in care having an effect on the children's development? I knew it would be irresponsible of me to leave this area until I had that answer."

Saul Kassin

John Jay College of Criminal Justice (New York) and Williams College, USA

False Confessions: A Journey From the Social Psych Lab to the Innocence Project's Exonerees

The Central Park jogger case is of historic significance. The exonerated five have become spokespersons for criminal justice reform, but the most important part of the story is to know that this fantastical incident is not a one-time only affair. It happens all the time.... It was clear, as attribution theorist Fritz Heider would have predicted, people instinctually trust confessions, statements against self-interest, sometimes to the point where nothing else matters. From [Stanley] Milgram on the one hand to Heider on the other, we had a problem.... The twin pillars of this problem were, first, people can be induced to confess the crimes they didn't commit by inter-

BJ Casey's research has shown that the adolescent brain is uniquely suited to the physical and social demands characteristic of this stage of life.

rogators. Two, the rest of the world will believe those false confessions. They will underappreciate the role of the situational forces."

2021 APS Mentor Award

Recognizes APS members who have significantly fostered the careers of others, honoring those who masterfully help students and others find their own voices and discover their own research and career goals.

BJ Casey

Yale University, USA

I believe that successful mentoring is a collective process. It involves building a scientific family and community who are bridged by their scientific curiosity and love of scientific discovery. This community together mentors and supports subsequent generations of mentees and celebrates all their many achievements along the way! There is no single mentoring style that fits all, but a collective of mentors and mentoring styles probably prepares you most. Look for individuals who are scientifically curious, productive and generative—but why stop at just one? We are in academia to teach future generations of scientists, so use us all. This will be true throughout your entire career."

Harald Merckelbach

Maastricht University, The Netherlands

The most important thing that I learned [from Marcel van den Hout, my PhD supervisor] was to think in terms of causal models and try to test your models once you have formulated them, try to test them to destruction.... What is important for growth—intellectual growth—is that you receive criticism. You should have a mentor that is nice, on the one hand, but also constructive and critical.... Because if you're working on your own, if you're working in isolation, you will not easily see your shortcomings and your failures. And ➡

if you really want to grow, you need critical feedback."

Miguel Moya

University of Granada, Spain

Investigative ability and rigor are not enough. I also think that the most important thing for a mentor is to show a great respect for one's mentees…. I believe that the mark of good mentoring is to strike a balance between fostering independence and autonomy in a student and offering guidance and assistance to them when necessary. This means being attentive to each student; to their vital and their academic circumstances. From my perspective, it is equally bad to leave a student alone throughout their development, as to relegate them to a mere executor of the ideas that have occurred to us."

Elizabeth Spelke

Harvard University, USA

The best research that [students] will do will be the research on questions they love, that keep them up at night, that they're fascinated by as they get clues to the answers…. What I try to do for all my students is to help them to find their way toward the questions and the lines of research that they're passionate about…. I try to do this in part by encouraging them when they hit obstacles, telling them there's always going to be obstacles in your path, and the more interesting the phenomena you're working on, likely the more surprises you'll get and therefore the more rethinking you'll need to do." ○

Miguel Moya is known for his innovative research on prejudice and for building a community around a rigorous science of social psychology in Spain.

⌨ See video profiles featuring the recipients of the 2020 and 2021 APS Lifetime Achievement Awards at psychologicalscience.org/awards and on the APS YouTube channel.

Elizabeth Spelke studies human cognition with a special focus on young children's unique and powerful learning capacity.

ADVOCACY, OUTREACH, AND PASSION FOR THE PROFESSION

By Charles Blue, APS staff

In his 2021 APS James McKeen Cattell Fellow lecture, Saul Kassin, Distinguished Professor of Psychology at John Jay College of Criminal Justice and Professor of Psychology Emeritus at Williams College, recounted startling examples of people who confessed to crimes they did not commit. One example was the widely publicized account of five Black and Latino teens who were falsely accused and later convicted of assaulting a White jogger in New York City's Central Park in 1989. Much of the jury's decision to convict in this case was based heavily on false confessions—later recanted—from four of the five defendants. The news of their eventual exoneration, however, received far less media attention than the initial story of their conviction.

This dearth of public interest in the true story was so vexing to Kassin that it inspired him to pen his first op-ed for *The New York Times,* describing his work on the justice system and cognitive processes that lead some people to confess to crimes they could not possibly have committed. It was the first of what would become many commentaries, letters, and public-outreach efforts for Kassin and sparked his interest in communicating psychological research that has a real-world impact.

"We, the psychological scientists of APS, really should communicate our findings to the public," said Kassin in his lecture. "Influencing policy from the top down, that's one way to instigate reform. Another is to make change by creating a groundswell from the bottom up.... If we don't speak up, that void will be filled by others less informed."

Getting the attention of the media

Kassin's point is well taken, but there is often a wide divide between what a scientist feels is a monumental discovery and what a journalist will find interesting enough to write about. As science communicators know, a finding's importance may or may not correspond to its news value; in fact, those two qualities may be at odds.

Several years ago, a group of reporters (including this one) attending a meeting for the American Physical Society discussed the characteristics that make a story compelling for a journalist. Beyond the usual superlatives that are frequent hallmarks of science news—biggest, fastest, most energetic, farthest-reaching, and so on—the reporters stressed the importance of topics that are personally relevant to the science-interested lay public.

To illustrate this point, of the thousands of results presented at that meeting, the one that received the most media coverage was an explanation of why mosquitoes are able to fly in the rain. For several scientists present, this topic was hardly worthy of attention. The result didn't advance the science or teach any fundamental concepts of fluid dynamics. The journalists' counterpoint was that it was not their job to teach members of the public the fundamentals of any science—that onus is on the scientists themselves. What journalists *can* do is to explain the broad relevance of a scientific advancement that illustrates and deepens readers' understanding of important fundamentals.

Communicating psychological science with the public

Psychological scientists shared a similar message with APS members last year in a series of virtual discussions titled "Communicating Psychological Science With the Public." The discussions (organized by APS Fellows David DeSteno, Northeastern University, and June Gruber, University of Colorado at Boulder) addressed many facets of public outreach, from podcasts and blogs to feature stories and editorials. In each video, either Gruber or DeSteno interviewed a successful science communicator, including *New York Times* senior editor James Ryerson, who directly addressed ways to turn a scientific finding into an object of public interest.

"Academics have a way of helping people realize that many things that they didn't think were interesting were [actually] very interesting, and they're often able to give a kind of deeper perspective on something going on in the news than is being discussed," said Ryerson.

He also explained what sorts of science-related pitches are more likely to get his attention. "If you do work and it's relevant to the sorts of topics that have been in the air for a while, I'm going to be a little more predisposed to be interested," Ryerson noted. "However, there are a lot of academics who can reach out with a perennial topic of fascination. A lot of it has to do, for me, with how surprising it is."

DeSteno summed this up nicely: "It really has to touch some nerve. The science isn't important for the science's sake; there has to be an additional element." ◉

TASKMASTER: A TOOL TO DETERMINE WHEN ONLINE PARTICIPANTS ARE ON TASK

Collecting data online has been somewhat common for years now (see Buhrmester et al., 2018; Gosling & Mason, 2015), and constraints on in-person data collection caused by the COVID-19 pandemic have made it an even more common research practice. However, moving from the highly controlled environment of a lab to an online environment where participants cannot be closely monitored may inspire doubts about whether participants are performing experimental tasks as instructed.

Although some researchers have shown that data collected online are frequently of equal or even higher quality than data collected in the lab (e.g., Dodou & de Winter 2014; Gosling et al., 2004), others have raised concerns about the attentiveness, honesty, and experience of online subject pools (e.g., Chandler et al., 2014).

TaskMaster can address some of these concerns. Developed by Stephanie Permut, Matthew Fisher, and APS Fellow Daniel M. Oppenheimer, of Carnegie Mellon University, this free tool helps researchers identify when online participants being tested through Qualtrics—an online survey platform often used for experiments in psychological science—are off task (e.g., using other online apps). In a 2019 tutorial published in *Advances in Methods and Practices in Psychological Science*, Permut and colleagues detailed several applications of TaskMaster and provided guidelines for its use.

Stephanie Permut encourages researchers who are interested in using TaskMaster to visit her GitHub page (steve-permut). She also welcomes emails at spermut@andrew.cmu.edu if you have questions or need assistance with the tool.

"We developed TaskMaster as a tool to help researchers better account for off-task participant behavior in Qualtrics data," Permut told the *Observer*. "The TaskMaster operationalizes off-task behavior as the amount of time that participants spend away from an active Qualtrics survey window. TaskMaster output can be used as a proxy for participant inattention and also as an indicator that participants' attention is focused where it ought to be" (i.e., that participants are doing tasks as instructed and not making use of outside resources if those resources are prohibited).

A tool to measure on-task time

Participants recruited through Amazon Mechanical Turk (MTurk) report high rates of multitasking while performing experimental tasks, from browsing unrelated web pages to using their phones (Clifford & Jerit, 2014). Multitasking creates the problem of divided attention, which decreases data quality and increases error rates (Borst et al., 2010). TaskMaster uses JavaScript to create variables representing the frequency with which participants enter and leave an active survey window and the length of time they spend both completing the experimental task and remaining within a given window.

TaskMaster is an extension of a validated tool, PageFocus, implemented by Diedenhofen and Musch (2017). It can be easily used within the exist-
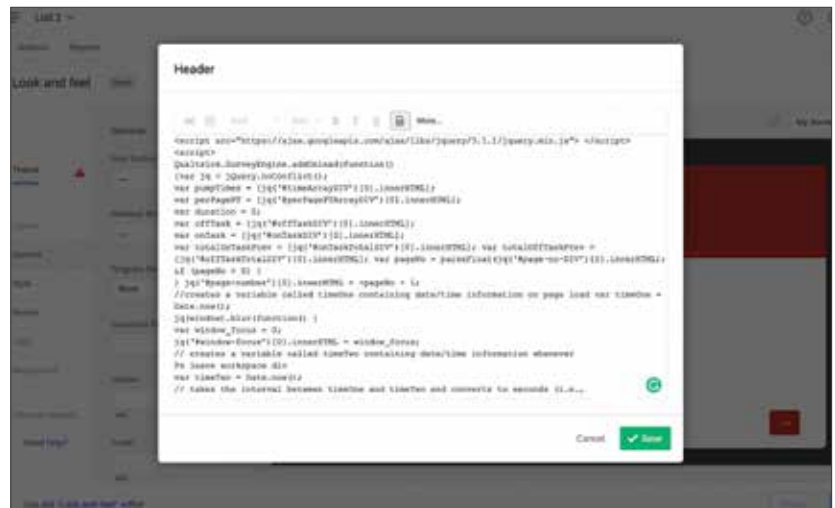
Screenshot of Qualtrics's Look & Feel menu with the header source editor opened and the source code displayed. Be sure to paste the TaskMaster code in the header's source code, because the default rich-text editor does not save custom JavaScript.

ing Qualtrics interface, but it goes beyond Qualtrics's page timer, which allows researchers to monitor the amount of time participants spend on a given page, by also letting researchers track the amount of time participants spend *off* a given page—even if it remains open.

Loading a page triggers a timer that tracks the amount of time a survey or task window remains in focus. The timer also measures and summarizes time spent with that window open but out of focus (i.e., because of activity on other tabs or applications). TaskMaster thus generates an index of how much time a participant spends on and off task for each page of a survey, creating a compilation of all on- and off-task activity during the survey or experiment.

Participants are unaware of Task-Master, but it does not invade their privacy because it does not track where they spend off-task time, just how long they stay off task.

Implementing TaskMaster

The JavaScript code for TaskMaster is available at github.com/steve-permut/TaskMaster and with this article on the APS website. The code can easily be added to the Qualtrics survey builder.

To add the code, paste github.com/steve-permut/TaskMaster/blob/master/HeaderCode.html into your Qualtrics survey's header source HTML, in the General tab of the survey's Look & Feel menu. When you download the survey data from Qualtrics, time spent on and off task is represented as an array of positive (on-task) and negative (off-task) values.

⌨ For more information about online research, watch the APS webinar Online Research: Tools and Techniques at psychologicalscience.org/webinars.

In addition, TaskMaster's footer code (github.com/steve-permut/TaskMaster/blob/master/FooterCode.html) allows researchers to track navigation data across an entire survey (rather than on one particular page). Paste it into the header source HTML, which is also found in the General tab of the Look & Feel menu.

TaskMaster outputs five variables per monitored page:

- worktimeArray: total time spent both on and off task
- onTask: time spent on task, presented as an array of items representing each time a subject's cursor entered the work space and the amount of time the subject spent within the task window
- totalOnTask: total time spent completing a task (without subtracting time spent off task)
- offTask: time spent off task, presented as an array of items representing each time the subject's cursor left the work space and the amount of time the subject spent off task
- totalOffTask: total time spent off task

You must manually add these variables as empty embedded variables in Qualtrics's Survey Flow. To add empty embedded variables, click on "+Add New Element" and then "Embedded Data." Next, click on "Create New Field or Choose from Dropdown" and input the first variable name. Then, click on "Add a New Field" below the window and repeat the process for each of the remaining variables. Label the variables exactly as shown. For the script to run properly, disable study transitions (also accessed in a survey's Look & Feel section). Then export these variables alongside other data in a Qualtrics-generated spreadsheet.

This tool splits the single column of arrays outputted by Qualtrics into a set of per-page variables. Each row in the spreadsheet represents a single participant's data, and there are four columns for each page of the survey:

- Page_N: on- and off-task behavior at the page level, with negative numbers indicating the duration of intervals with the cursor outside the task window and positive numbers indicating the duration of intervals with the cursor inside the task window
- Page_N_ClickAways: number of times the subject clicked away from the page (corresponding to the count of negative values in the Page_N array)
- Page_N_TimeOffPage: total amount of time spent off a given page (the absolute value of the sum of the negative values in the Page_N array)
- Page_N_TimeOnPage: total amount of time spent on a given page (the sum of the positive values in the Page_N array) ◉

References

Permut, S., Fisher, M., & Oppenheimer, D. M. (2019). TaskMaster: A tool for determining when subjects are on task. *Advances in Methods and Practices in Psychological Science*, *2*(2), 188–196. https://doi.org/10.1177/2515245919838479

See the full reference list online at psychologicalscience.org/taskmaster.

SHARED REALITY: THE HUMAN MOTIVE TO CONNECT AND BE UNDERSTOOD

By Beth Morling

Your 9-month-old, squealing excitedly, points to something she sees across the park.

- Across the room at a party, your spouse flashes you That Look, which you both know means "this guy's a mansplainer!"

- Two college roommates crack up, exclaiming, "I was just going to say that!"

These exchanges charm us. They are tiny instances of *shared reality*—moments that reflect deep human motives to be connected and understood.

Shared reality can describe a perceived state, such as when two people simultaneously remark how much they love *The Circle*. But shared reality also describes a human motivation, manifested when a baby points or when a spouse tells a secret. E. Tory Higgins, Maya Rossignac-Milon, and Gerald Echterhoff (2021) introduce shared reality as "the perceived commonality of inner states (feelings, judgments, concerns) with other people."

Humans seem uniquely motivated to share inner states. If adults turn their head to stare across the room, most 8-month-old infants (and even some 2-month-olds) will follow their gaze, as if infants want to share adults' perceptions (Scaife & Bruner, 1975). Babies as young as 7 months point at novel objects with the apparent intent of wanting us to notice them, too. Higgins marvels at this motivation. Any animal that has arms and can make sounds is functionally able to point, he wrote in an email. "As far as intelligence goes, it's not that impressive." But only humans seem motivated to actually do it. "[Only] human infants want to share with another what they find interesting…. It is a difference in motivation, not a difference in intelligence" (personal communication, April 2021).

When shared reality is achieved, it satisfies core human motivations both to understand and to relate to others (Higgins, 2019). In their *Current Directions* article, the authors summarize two major lines of research.

Sharing is believing (…and remembering)

The *sharing-is-believing effect* describes a memory bias. When people describe something to another person, they later describe and remember it in a way that matches that person's opinion. For example, if Alex and Jordan discuss a movie, Alex will describe it positively if Jordan liked it (or negatively if Jordan disliked it). After that conversation, Alex's memory will shift toward her own description, which was tuned to Jordan's opinion (Echterhoff et al., 2005). Alex will remember the movie more positively (or negatively) than she would have otherwise, especially if the two felt they created a shared understanding.

The sharing-is-believing effect illustrates our motivations both to connect with others and to make sense of the world. The effect is strongest when people share messages with in-groups, suggesting that sharing reality both depends upon and builds up trusted bonds. Sharing messages with close others also leads people to conclude that those messages are true; in any memory system, true messages should be stickier.

Perhaps the sharing-is-believing effect can be a teaching tool. By explaining a concept to a trusted teacher, students must tune their message to an in-group audience who already understands the concept. The resulting sense of shared reality could make the concept more memorable.

APS Fellow **Beth Morling** is professor of psychological and brain sciences at the University of Delaware. She attended Carleton College and received her PhD from the University of Massachusetts at Amherst. She teaches methods, cultural psychology, a seminar on the self-concept, and a graduate course in the teaching of psychology.

STUDENT ACTIVITY:
SHARING REALITY WITH A PARTNER

Dyads can share reality, too. Generalized shared reality (SR-G) occurs when two people share inner states with respect to a variety of targets (Rossignac-Milon et al., 2021). SR-G can happen when dyads share similar views on music, current events, or celebrities; couples may have inside jokes or "our song." SR-G can also explain those magic moments when we "just click" with someone. SR-G fulfills both motives: to feel close and to feel right.

See if you can create a few such moments with this classroom exercise. Ask your students to sit with another person whom they do not already know (in a remote class, you could create novel dyads in breakout rooms). Display the image and questions below on a slide. You and your partner will work together to answer several questions about the picture below. Your goal will be to figure out together what you think is really going on in the picture. You will have 2 minutes to discuss each question.

1. Why do you think the person in the white shirt and the person standing behind the couch are talking?

2. What do you think will happen next (after the moment of the picture)? Why?

3. Considering what you have discussed, how do you think you would feel in this situation if you were the person in the white shirt?

After the conversation, ask students to privately reflect on which of the behavioral markers of SR-G they experienced and rate their interaction using the SR-G assessment items (see Table 1).

Time permitting, correlate the number of behavioral markers each dyad experienced (column 1) with their SR-G responses (column 2), using one response per dyad. Employing this method in earlier research, Rossignac-Milon and colleagues found a positive correlation between behavioral signatures of shared reality and dyadic SR-G scores (Rossignac-Milon et al., 2021). Consistent with the theory, ratings of SR-G predicted both relational variables (e.g., the extent to which pairs of dyads felt like they "clicked") and epistemic ones (e.g., the feeling that "my partner is a person whose judgment I trust").

To further students' understanding, pose these discussion questions:

1. Reflect on a shared reality you have experienced, either in the class exercise or in your real-world relationships. How does it feel? (The instructor should amplify responses that mention both relatedness and epistemic motives.)

2. SR-G differs from sharing traits with another person. You and a partner might both come from the same hometown and be psychology majors—but you might not "click" in the shared-reality sense. Can you think of additional examples of how shared reality is different from simple similarity? (The instructor can amplify how SR-G occurs in the moment and is about sharing inner states with respect to the outside world.)

As you close out the lesson, direct interested students to this BBC journalist's take (bbc.in/3bFuuD4) on how SR-G helps dyads "click" (Leslie, 2020). ➡

EDITED BY C. NATHAN DEWALL

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

TABLE 1

Behavioral signatures of shared reality during a conversation about an image	Items to assess SR-G, answered from 1 (strongly disagree) to 5 (strongly agree)
Did you vocalize thought similarity, by saying something like, "I was thinking the same thing!" or "you read my mind," or "exactly" or "yes!"? Did you vocalize agreements and shared feelings, by saying "I totally agree," or "so true", or "that makes total sense"? Did you ever say things at the same time (or nearly so)? Did you finish each other's sentences or ideas? Perhaps you were riffing off of each other's ideas, building off of each other's stories, and so on.	During our conversation… …we shared the same thoughts and feelings about things. …we developed a joint perspective. …we thought of things at the exact same time. …we saw the world in the same way.
Provide a number from 0 to 4, indicating how many of these behavioral signatures you experienced: _____	Rate each item, and then provide an average of your rating of the four items: _____

References

Echterhoff, G., Higgins, E. T., & Groll, S. (2005). Audience-tuning effects on memory: The role of shared reality. *Journal of Personality and Social Psychology*, *89*(3), 257–276. https://doi.org/10.1037/0022-3514.89.3.257

Higgins, E. T. (2019). *Shared reality: What makes us strong and tears us apart*. Oxford University Press.

Leslie, I. (2020, September 20). What makes strangers click? *BBC Worklife*. bbc.com/worklife/article/20200917-what-makes-strangers-click.

Rossignac-Milon, M., Bolger, N., Zee, K. S., Boothby, E. J., & Higgins, E. T. (2021). Merged minds: Generalized shared reality in dyadic relationships. *Journal of Personality and Social Psychology*, *120*(4), 882–911. https://doi.org/10.1037/pspi0000266

Scaife, M., & Bruner, J. S. (1975). The capacity for joint visual attention in the infant. *Nature*, *253*(5489), 265–266. https://doi.org/10.1038/253265a0

Sokolowski, K., Schmalt, H.-D., Langens, T. A., & Puca, R. M. (2000). Assessing achievement, affiliation, and power motives all at once: The multi-motive grid (MMG). *Journal of Personality Assessment*, *74*(1), 126–145. https://doi.org/10.1207/S15327752JPA740109

AMPPS is OA

Advances in Methods and Practices in Psychological SCIENCE

A Journal of the **Association for Psychological Science**

www.psychologicalscience.org

APS is pleased to announce that *AMPPS* is an open-access (OA) journal. All *AMPPS* content, including articles that were previously published, is now publicly available.

Visit the AMPPS Open Access FAQ to learn more
**www.psychologicalscience.org/ampps-faq**

WHAT'S WRONG WITH THIS PICTURE? JUST ABOUT EVERYTHING.

Revisiting how we depict Pavlovian conditioning
By Michael Domjan

The diagram at right, or something like it, is frequently used to introduce students to the type of learning research pioneered by Russian physiologist Ivan Pavlov. Pavlovian conditioning remains a popular and important form of learning more than a century after Pavlov accepted the Nobel Prize in 1904 for his work on the digestive system. Unfortunately, this diagram does not convey why Pavlovian conditioning remains a core phenomenon in psychology. The diagram also perpetuates numerous misconceptions about Pavlovian conditioning.

Pavlov did not ring a bell as a conditioned stimulus (CS). The initial experiments on salivary conditioning were carried out by Pavlov's research assistants, Sigizmund Vul'fson and Anton Snarskii, who used a visual rather than auditory cue as the CS. The experimental protocol was relatively simple. A substance such as dry food, sand, or sour water was placed in a dog's mouth on repeated trials. These substances elicited salivation without training, or unconditionally. The novel finding was that after a number of trials, the dogs started salivating at the sight of the substance that was to be placed in their mouth. The source of the visual CS in the original experiments is highly significant and has broad implications for how Pavlovian conditioning occurs in the natural environment.

In a typical diagram, the CS (in this case, a bell) is characterized as a
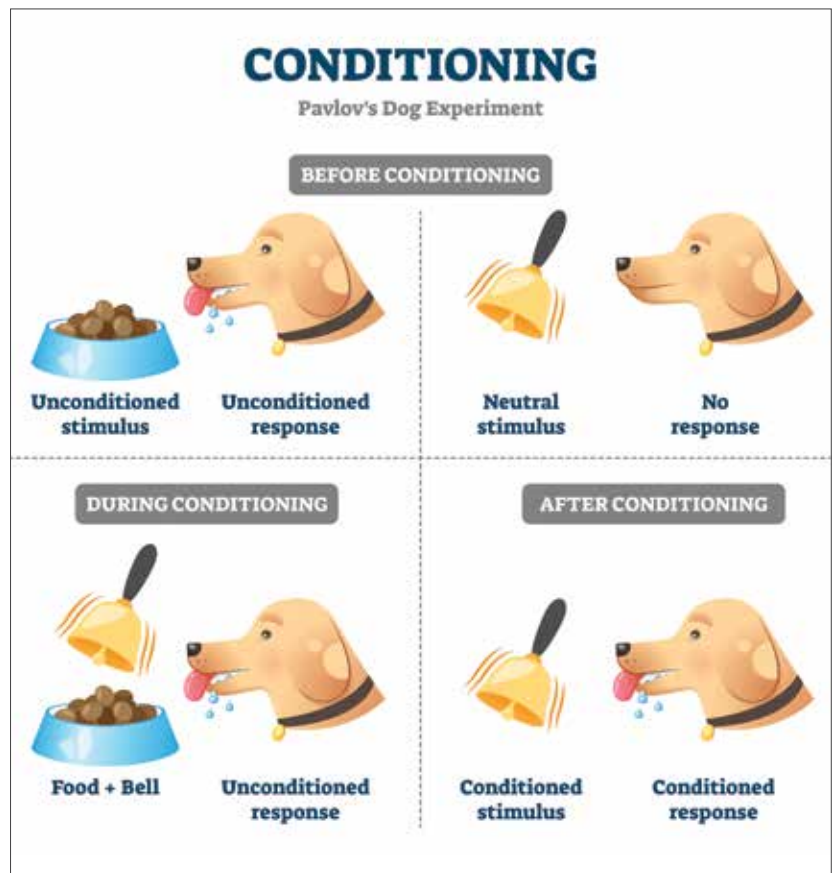
A typical diagram illustrating Pavlovian conditioning, which characterizes the conditioned stimulus, a bell, as neutral and unrelated to the unconditioned stimulus, food. As Michael Domjan writes, however, CS and US are more often features of the same object or have a pre-existing relationship in the natural world—for example, the sound of dogs barking and the pain of getting bitten.

"neutral" stimulus that is initially unrelated to the unconditioned stimulus (US; in this case, a steak). However, that was not the case in Vul'fson's and Snarskii's experiments. The dogs in their experiments learned a relationship between different features of the substances or objects that were placed in their

Michael Domjan, an APS Fellow, is professor of psychology at the University of Texas at Austin and author of *Principles of Learning and Behavior* (7th edition, Cengage, 2015) and *Essentials of Conditioning and Learning* (4th edition, American Psychological Association, 2018).
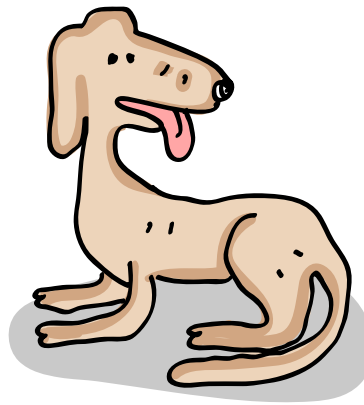
mouths. Those objects had features that elicited salivation unconditionally and visual features that came to elicit salivation through association with the US features. The fact that the CS and the US were features of the same object ensured that the two stimuli would be experienced in close temporal proximity, which facilitated their association.

Pavlovian conditioning requires repeated pairings of a CS with a US. Such pairings occur outside the lab only if there is an inherent relationship between the CS and the US. Thus, Pavlovian conditioning in the natural environment involves the type of arrangement that Vul'fson and Snarskii created. Most naturally occurring examples of Pavlovian conditioning involve learning about a CS that has an inherent or pre-existing relation to the US and therefore is not "neutral" or "arbitrary." When a child becomes fearful of dogs after a dog bite, they are forming the type of within-object association that Vul'fson and Snarskii originally demonstrated. One feature of the dog (its visual appearance or bark) comes to elicit fear because it is associated with other aspects of the dog (the dog's bite). Social phobias,

fear of public speaking, and fear of intimacy are all learned in the same fashion: The presence of others becomes a signal, or CS, for an aversive outcome, or US, in certain social situations.

Learning to link together different features of an object or situation extends the scope of Pavlovian mechanisms well beyond conditioned salivation. However, the emphasis on conditioned salivation in teaching about Pavlovian conditioning has promoted the misconception that Pavlovian learning is limited to glandular responses that are of little psychological interest. B. F. Skinner reflected that line of thinking in his landmark book, *Science and Human Behavior* (1953), in which he seemed to take pleasure in Bernard Shaw's irreverent description of Pavlov's work as just having to do with "the spittle of dogs." Unfortunately, Skinner's take on Pavlovian conditioning remains evident in contemporary books on behavior analysis. The latest edition of the comprehensive text *Applied Behavior Analysis* (Cooper et al., 2020), for example, includes Skinner's claim that "reflexes, conditioned or otherwise, are mainly concerned with the internal physiology of the organism" (1953, p. 59). This claim ignores research on different forms of Pavlovian conditioning such as sign tracking, goal tracking, sexual conditioning, and conditioning of various forms of defensive behavior that promote effective interactions with the external environment rather than "internal physiology."

The common diagram of Pavlovian conditioning also promotes the misconception that a discrete conditioned reflex is the primary outcome of Pavlovian learning. However, Pavlovian conditioning is also involved in the learning of emotions, preferences and aversions, and likes and dislikes that can be expressed in a variety of different ways. In many cases, moreover, the most important outcome of conditioning is not the emergence of a new response to the CS but the capacity of the CS to change how the individual responds to the US. The conditioned salivation that Vul'fson and Snarskii observed was important because it enabled the dog to respond more effectively to the dry food or sand that was about to go in its mouth. In a similar fashion, studies have shown that conditioned stimuli enable organisms to cope more quickly and more effectively with a variety of different unconditioned stimuli such as food, an aggressive intruder, or a potential sexual partner. Conditioned modifications of the response to the US are also critical when the US is the administration of a drug: Learning to anticipate the drug allows individuals to make homeostatic compensatory adjustments that reduce the drug's effects. These conditioned compensatory responses are missing if the drug is taken in the absence of the usual drug-predictive cues, and that can result in drug overdose. Thus, rather than being concerned just with the "spittle of dogs," Pavlovian conditioning can be a matter of life or death.

We have learned a lot since the pioneering experiments of Vul'fson and Snarskii. No one diagram can be expected to accurately capture the richness of contemporary knowledge about Pavlovian conditioning. However, I hope that diagrams can be developed that will at least represent the original experiment correctly and show Pavlovian conditioning as the pervasive natural learning phenomenon that it is rather than a creation of laboratory scientists who misleadingly label a CS as "neutral" or "arbitrary." ●

Most naturally occurring examples of Pavlovian conditioning involve learning about a CS that has an inherent or pre-existing relation to the US and therefore is not "neutral" or "arbitrary."

Marissa Shuffler, a professor of industrial-organizational psychology at Clemson University, researches how teams work together in trying circumstances.

MARISSA SHUFFLER ON THE PRINCIPLES OF TEAMWORK

Marissa Shuffler
Spotlight

Current role: Associate professor of industrial-organizational psychology at Clemson University, 2013–present

Previously: Graduate research associate at the Institute for Simulation & Training, University of Central Florida, 2008–2013

Terminal degree: PhD in industrial and organizational psychology, University of Central Florida, 2013

Recognized as an APS Rising Star in 2017, National Science Foundation CAREER Award in 2017

Marissa Shuffler is an associate professor of industrial-organizational psychology at Clemson University. She works with teams across the fields of health care, space exploration, and the military to help people work together more effectively in high-stress contexts.

Landing the job

During my PhD, my plan was to go back to a management consulting firm I had worked for previously. When I was starting my dissertation, I had a great conversation with my advisor that made me realize that an academic route would be a better fit because I could do a lot of applied research work with organizations while still having a lot of control over what I was researching and when I was doing it, in addition to working with students.

Working together

My dissertation research looked into the challenges of leading virtual teams, which has really come into the forefront in the past year. I've also been working very closely with a local health care system since 2014 on issues related to

multi-team systems, leadership, and teamwork. Teams of teams have to work together to accomplish higher-order goals, especially in high-stress, complex, and dynamic organizations like those in health care, spaceflight, and the military. While I do some of my work in the lab, right now you are likely to find me in the field studying real teams and the issues they are facing.

Burning out in a pandemic

A major issue in health care is clinician burnout. I'm sure it's not a surprise, but it's just gotten worse over the past year, unfortunately. I mean, think about the many challenges we've all been trying to manage while working during a pandemic, but add onto that trying to save lives. Usually we tend to cope with stress and burnout at work through social support or disconnecting from work for a while. Unfortunately, working in a pandemic means that health care workers can't always go home; they can't always get that support from their loved ones because they're worried about getting their family sick. Even now, a lot of them are still limiting their interactions with family and friends and relying more on coworkers for this social support.

I think there's been increased recognition that we need to pay attention to burnout, and it's not just about getting people to be individually more resilient or more mindful. It's about providing a system of resources, a system of support, to help organizations manage that.

Jump right in

I like to let students jump in and get their feet wet with some of the nitty-gritty details of the applied research I do. My students don't just go and read articles about working in health care settings; they're actually in the health care setting and doing research—they're working. Getting involved and being able to see some of the issues and challenges in person is a really important thing. It helps keep you connected—it helps you understand why you're doing this and what the purpose of the research is.

From surgeons to the stars

For me, the number one thing is those "a-ha" moments and getting to see how our work is applied. On one of the best days I've ever had as a researcher, I spent my morning observing a brain surgery, and my afternoon talking with folks from NASA about the critical role of teamwork between the ground crew and the International Space Station. It was really fascinating to see how these two high-stress, high-demand contexts were so different but also alike in so many ways when it comes to being an effective team.

Researching under pressure

One of the main issues is trying to manage the balance of doing high-quality research in contexts where there are sometimes barriers and limitations to the way we might want to ideally design a study. We know good principles and practices from experimental design and data analysis, but it's not always easy to get working professionals to fill out a very long survey. So if you only have 5 minutes, what can you do with that?

I also try to balance publishing in traditional academic journals with translating those findings so that they can be put into use. I don't want to create research only for the sake of creating research that no one's going to ever read. I want to put it into practice, and that takes time.

Principles of teamwork

When I teach classes on teamwork, the thing I tell them from Day 1 is the importance of role clarification. One of the most important things you can do is clarify the roles of your team members to make sure that you actually have a purpose, a reason that each person is on the team. Sometimes we end up with teamwork situations where you don't actually need a team, and then you create all kinds of additional challenges since not everyone has a purpose.

Another principle that we've seen a lot of is just the need for psychological safety. This isn't just a touchy-feely type thing. It's about creating this environment where, if I speak up about an idea or concern, I won't be penalized or laughed at. I think that applies to lots of different contexts. In health care, it's a huge component of preventing medical errors, but even in low-stress environments, most people still need to feel psychologically safe in their work teams.

Advice for students

One of the things I cannot recommend enough would be internships, whether you are not completely sure if a career is the right fit or if you're 100% sure of your future dream job. As an undergraduate, I was convinced I was going to be a clinical child psychologist up until the end of my junior year. Then I did an internship and I realized I was much more interested in understanding the dynamics behind how the psychologists, social workers, and administrators were working together in an alternative school. If I had not done that internship, I wouldn't have realized that there was a better career path for me in I-O psychology. ●

A COHORT CONUNDRUM

How to avoid the trap of intra-lab competition

By Elizabeth Quinn

When I accepted my admission offer to graduate school, I was horrified to discover that two other students had also accepted offers of admission to the same research lab. It was not wholly surprising; the principal investigator (PI) I had interviewed with was relatively new to the program and had no graduate students. Still, I cringed at the thought of starting graduate school—an already hypercompetitive environment—at the same time as two other bright young scholars. We would all be competing for the same resources, vying for the same accolades, and, with any luck, entering the job market at the same time. When I told a friend already in graduate school about my incoming cohort, her comment was foreboding: "Tough luck, kid."

Now, toward the end of my first year, I can say with quite a bit of certainty that "tough luck" it was not. In fact, my lab mates have become two of my most trusted confidants. However, it's easy to see how things could have gone differently. Many faculty and graduate students can speak of firsthand experiences with intra-lab competition: stories of PIs pitting peers against one another and of lab mates reluctant to share materials for fear of being "scooped." I feel fortunate that my experience did not become another cautionary tale. Yet it was not happenstance that led to my fortunate situation; it was a learning curve. Here are four of the most important lessons I learned.

Acknowledge and accept that competition exists

The first step in overcoming any great obstacle is acknowledging that it exists

and accepting what you cannot change. Competition is a natural part of graduate school and academia in general. The truth is that there are a finite number of grants, awards, and research positions and a larger number of people vying for them. And the odds become worse as you move up the academic ladder—ask any graduate student currently on the job market.

Trying to ignore competition is like trying to suppress the thought of white bears (Wegner et al., 1987). Acknowledging that it exists is the key to removing its power. I remember the moment my lab mates and I discussed how we would all be applying for the National Science Foundation (NSF) doctoral fellowship this coming year. Was I filled with existential dread knowing I would be competing against my two friends for a national fellowship? Absolutely. Instead of ruminating on that dread, however, my lab mates and I acknowledged the awkwardness, openly discussed our NSF proposal ideas, and offered to give each other feedback. The relief I felt after this conversation minimized the dread. If I learned anything from *Scooby Doo*, it is this: The monster is always less scary without the mask.

Support and celebrate each other

It is hard to celebrate the success of others in academia when it often feels like a zero-sum arena, where a win for others means a loss for you. Still, a lonely road awaits those who spend their time agonizing over what others have accomplished. Plus, research shows that celebrating the success of others increases the celebrator's happiness (Conoley et al., 2015), which in turn increases the discloser's happiness (Gable et al., 2004). And we all know the multitude of benefits that result from increased happiness—including better health, higher income, and greater success at work (Diener & Tay, 2017). Further, when you finally secure that coveted grant (or fellowship, or faculty position), you'll be thrilled to have others celebrating your success in return.

And although it might be hard to see the forest for the trees, a success for one can be a success for all. The benefit of having peers who've achieved greatness is that you get to learn from their success. Many of the achievements I have

Elizabeth Quinn is a doctoral student in the social psychology department at the University of California, Santa Barbara. She studies how individuals' social identities impact their perceptions and behaviors.

accomplished in my (admittedly short) academic career were made possible by the mentorship of those who had accomplished those goals before me. I doubt I'm the only for whom this is true.

Friendship is vital

I cannot stress enough how important it is to become friends with your lab mates. The summer before graduate school, my lab mates and I had already formed a group chat and had virtual meetups. By the time school started, we were the best of friends. Very few people outside of academia can understand the pressures of graduate school: the self-doubt, the rejection, the uncertainty of it all—it is unlike any other experience. Throughout the process, you will want others by your side who understand that struggle. And that zero-sum arena—it will feel a lot less finite with someone trusted by your side.

It may seem like an impossible notion—the idea that you can simultaneously be disappointed in not reaching your goals and happy that another person has. However, it is possible and made easier when that other person is your friend. After all, who doesn't want a friend to achieve their goals? Who isn't filled with a sense of pride when someone they respect triumphs? My lab mate and I applied for the same grant this year, and I say can say this next sentence without lying: I truly hope she wins it.

Choose a PI who does not promote competition

A recent metanalysis published by Sverdlik and colleagues (2018) demonstrated that advisors were critical to the completion, achievement, and well-being of doctoral students in graduate school. The same could be said for intra-lab competition. The PI sets the lab's tone. Therefore, it is important to choose a PI who understands the value of an open and collaborative environment. If you are applying to graduate school, make sure to reach out to current students in the program. They may not answer specifically—there is, sadly, a lot left unspoken in academia—but asking concrete questions can help. For example, "Is it common for graduate students to collaborate?" or "Do students socialize outside the lab?" Granted, you can't always know before starting graduate school if your advisor is the type to promote unhealthy competition. But you don't have to participate in that competition. Run your own race. Five years is a long time to chase other people's coattails.

Conclusion

It's important to note that competition is not always bad. No doubt many of the world's greatest ideas and innovations were driven by a healthy sense of competition. It can push us to work harder, learn new skills, and achieve personal bests. But competition driven by the assumption that there is a finite amount of success or achievement available in the world is not healthy (Różycka-Tran et al., 2019) and is particularly unsettling when it pits lab mates against one another. You will, no doubt, leave your graduate institution with a few not-so-fond memories. My hope for you is that those memories have more to do with one or two failed experiments and less to do with insecurities about the success of others. ◉

References

Conoley, C. W., Vasquez, E., Del Carmen Bello, B., Oromendia, M. F., & Jeske, D. R. (2015). Celebrating the accomplishments of others: Mutual benefits of capitalization. *The Counseling Psychologist, 43*(5), 734–751. https://doi.org/10.1177/0011000015584066

Diener, E., & Tay, L. (2017). A scientific review of the remarkable benefits of happiness for successful and healthy living. In K. Ura (Ed.), *Happiness: Transforming the development landscape* (pp. 90–117). Centre for Bhutan & GNH Studies.

Gable, S. L., Reis, H. T., Impett, E. A., & Asher, E. R. (2004). What do you do when things go right? The intrapersonal and interpersonal benefits of sharing positive events. *Journal of Personality and Social Psychology, 87*(2), 228–245. https://doi.org/10.1037/0022-3514.87.2.228

Różycka-Tran, J., Piotrowski, J. P., Żemojtel-Piotrowska, M., Jurek, P., Osin, E. N., Adams, B. G., Ardi, R., Bălțătescu, S., Bhomi, A. L., Bogomaz, S. A., Cieciuch, J., Clinton, A., de Clunie, G. T., Czarna, A. Z., Esteves, C.S., Gouveia, V., Halik, M. H. J., Kachatryan, N., Kamble, S. V., . . . Maltby, J. (2019). Belief in a zero-sum game and subjective well-being across 35 countries. *Current Psychology*. Advance online publication. https://doi.org/10.1007/s12144-019-00291-0

Sverdlik, A., Hall, N.C., McAlpine, L., & Hubbard, K. (2018). The PhD experience: A review of the factors influencing doctoral students' completion, achievement, and well-being. *International Journal of Doctoral Studies, 13*, 361–388. https://doi.org/10.28945/4113

Wegner, D. M., Schneider, D. J., Carter, S. R., & White, T. L. (1987). Paradoxical effects of thought suppression. *Journal of Personality and Social Psychology, 53*(1), 5–13.

APS Student and Early-Career Resources

A wealth of content to help chart your career path, navigate transitions from student to postdoc and early-career researcher, and take a deeper dive into relevant issues in the field.

Register for upcoming webinars and access the webinar library.

psychologicalscience.org/webinars

aps
ASSOCIATION FOR
PSYCHOLOGICAL SCIENCE

2021 APS ENTREPRENEURSHIP POSTER AWARDS

The APS Psychological Science and Entrepreneurship Poster Award is intended to stimulate research in entrepreneurship, defined as the capacity and willingness to develop, organize, and manage a business venture, along with its risks, in the pursuit of opportunity and innovation. The 2021 winners, who each received a $1,500 award, briefly describe their work below.

Early-career winner: **Nikki Blacksmith, Blackhawke Behavior Science, USA**

Diversity and Performance in the Entrepreneurial Ecosystem: A Case for Selection Research

Certain behaviors are necessary for entrepreneurs and start-up teams to succeed in their work. Coauthor McCusker and I identified which personality, motivational, and cognitive traits underlie those behaviors.

There exists very little science on what predicts entrepreneurial success, which leads too many start-ups to fail. We draw from job performance and employee selection theories to identify predictive relationships between people's attributes and their performance as entrepreneurs.

Three ideas really motivated us: (a) the scant amount of investor money that goes to female (< 3%) and underrepresented minority (< 1%) entrepreneurs; (b) the shockingly high number of start-ups that fail because of preventable human capital issues; and (c) the underrepresentation of industrial-organizational psychologists in the entrepreneurial ecosystem to fix these challenges. Our taxonomy lays a foundation for using research, science, and data to make the entrepreneurial ecosystem more diverse, data-driven, fair, and successful.

Our results are relevant to the public for two reasons. First, gone are the days of making business-related decisions based on gut or intuition. In today's world, decisions need to be backed by data and science. Our results show that with research, hard work, and psychology (of course!), we can make better, more impactful data-driven decisions. Second, our results show there is no one-size-fits-all for being a successful entrepreneur. Entrepreneurs represent, as they should, all shapes, sizes, and backgrounds and have all kinds of knowledge and skills.

This research shows that with a little self-awareness, anyone can develop and grow the knowledge, skills, abilities, and other characteristics needed to succeed as an entrepreneur.

Student winner: **Dohyung (Jacob) Cha, Seoul National University, Republic of South Korea**
Pleasurable Future Now, Painful Reality Later? Entrepreneurial Positive Future Thinking Predicts Stock Crashes in the Dot-Com Bubble (Burst), 1995–2001

If you plan to buy stock in an initial public offering, watch the offering prospectus's words as well as its numbers. It is likely to betray your expectations if it is crowded with positively framed narratives about the future, according to studies of the dot-com crashes.

Economists have actively addressed the question of why dot-com crashes happened, but they (naturally) have tended to focus on socioeconomic factors. I sought to explore the psychology of this phenomenon and found that entrepreneurial cognition matters—especially how entrepreneurs frame their ideas and communicate them to investors.

I'm most excited about the generalizability of the findings. Honestly, I owe a huge intellectual debt to studies by Gabriele Oettingen and colleagues on "positive fantasy," which found that U.S. presidents and journalists who tend to be overly optimistic may cost the economic future. I simply extended this wisdom into the entrepreneurial context. In another study (in progress), I found that the generalizability of the results extends into most publicly listed firms too.

The results are relevant to the public because "bubble" talk is once again everywhere because of central banks' monetary easing. Though it is hard to predict when the market might crash, I suggest we learn from earlier dot-com bubbles. Moreover, even if we dodge the next bubble event, we can expect company-level stock crashes everywhere. Also, entrepreneurs tend to prop up their pitches with positivity, so I believe that the public should learn to discern warning signs from their words. ◉

⊕ See these award-winning posters with this article and learn more about the award and its sponsor, the Ewing Marion Kauffman Foundation, at psychologicalscience.org/observer/blacksmith-cha.

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

Observer

ASSOCIATION FOR PSYCHOLOGICAL SCIENCE
1800 Massachusetts Ave, NW, Suite 402
Washington, DC 20036-1218 USA

Change Service Requested

Time-Sensitive Material