**Integrative Science Symposia**

**Our Social Brain: Neurobiology of Human Interactions**
- **Christian Keysers**, Social Brain Lab, Netherlands Institute for Neuroscience, and Department of Psychology, University of Amsterdam, The Netherlands
- **Brian D. Knutson**, Department of Psychology and Neuroscience, Stanford University, USA
- **Rebecca Saxe**, Department of Brain and Cognitive Sciences, Massachusetts Institute of Technology, USA

**Who’s In, Who’s Out? Loneliness, Exclusion, and Integration**
- **Taciano L. Milfont**, School of Psychology, Victoria University of Wellington, New Zealand
- **Frosso Motti-Stefanidi**, Department of Psychology, National and Kapodistrian University of Athens, Greece
- **Alan Teo**, Department of Psychiatry and School of Public Health, Oregon Health & Science University, USA

**Better Minds: Understanding Cognitive Enhancement**
- **Daphne Bavelier**, Department of Psychology, University of Geneva, Switzerland
- **Arthur F. Kramer**, Department of Psychology, University of Illinois at Urbana-Champaign, USA
- **E. Glenn Schellenberg**, Department of Psychology, University of Toronto, Canada
- **Ilina Singh**, Department of Psychiatry, University of Oxford, United Kingdom

**Emotions in Context**
- **Ralph Adolphs**, Division of the Humanities and Social Sciences, California Institute of Technology, USA
- **Iris M. Engelhard**, Department of Psychology, Utrecht University, The Netherlands
- **Klaus R. Scherer**, Department of Psychology, University of Geneva, Switzerland (Discussant)
- **Jeanne L. Tsai**, Department of Psychology, Stanford University, USA
- **Frank H. Wilhelm**, Department of Clinical Psychology and Psychotherapy, University of Salzburg, Austria

**The Push and Pull of Values and Behavior**
- **Scott Atran**, School of Anthropology and Museum Ethnography, University of Oxford, United Kingdom
- **Chi-yue Chiu**, Department of Psychology, The Chinese University of Hong Kong, China
- **Hazel R. Markus**, Department of Psychology, Stanford University, USA
- **Heidi Keller**, Department of Psychology, Osnabrück University, Germany
- **Walter Mischel**, Department of Psychology, Columbia University, USA (Discussant)

**Bridging the Lab and the Real World**
- **Karen E. Adolph**, Department of Psychology, New York University, USA
- **Rick Dale**, Department of Cognition & Information Sciences, University of California, Merced, USA
- **Susan Goldin-Meadow**, Department of Comparative Human Development, The University of Chicago, USA
- **Emiliano Macaluso**, Impact Team, Lyon Neuroscience Research Center, France

**In Sync: The Dynamics of Social Coordination**
- **Nick Chater**, Behavioural Science Group, Warwick Business School, United Kingdom
- **Shaun Gallagher**, Department of Philosophy, University of Memphis, USA
- **Marco Iacoboni**, Department of Psychiatry and Biobehavioral Sciences, University of California, Los Angeles, USA
- **Andrzej Nowak**, Department of Psychology, University of Warsaw, Poland and Florida Atlantic University, USA
- **Natalie Sebanz**, Department of Cognitive Science, Central European University, Hungary

**The Science of Successful Aging**
- **Monica Fabiani**, Department of Psychology, University of Illinois at Urbana-Champaign, USA
- **Denise C. Park**, Center for Vital Longevity, The University of Texas at Dallas, USA
- **Karl A. Pillemer**, Department of Human Development, Cornell University, USA
- **Lorraine K. Tyler**, Department of Psychology, University of Cambridge, United Kingdom

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KEYNOTE SPEAKERS

Cognitive Evolution: People Are Animals Too
W. Tecumseh Fitch
Department of Cognitive Biology
University of Vienna, Austria

How Infants Break Into Language
Linda B. Smith
Department of Psychological and Brain Sciences
Indiana University Bloomington, USA

Genetic and Brain Diversity in AutismS
Thomas Bourgeron
Department of Human Genetics and Cognitive Functions
Pasteur Institute, France
Psychological scientists will need to work with increasingly diverse participant pools to ensure that their findings cover the full spectrum of human experience. Cornell University researcher and APS Fellow Qi Wang dispels some of the assumptions that researchers make about integrating cultural factors into their investigations.
Presidential Column
Robust Science Depends on Understanding the Science of Humans

APS Fellow Howard C. Nusbaum serves in a leadership position at the National Science Foundation. From this vantage point, he devotes a guest column to discussing how even the most robust science is still vulnerable to human error.

Science in Policy
Harnessing the Wisdom of Crowds to Improve Hiring

Incorporating psychological research on implicit bias in hiring, the United Kingdom’s Behavioural Insights Team is investigating collaborative ways to help companies select the most qualified candidates for job openings.

Videos Share the Psychological Study of Language

With support from the APS Fund for Teaching and Public Understanding of Psychological Science, researchers at Cleveland State University have developed a video series focused on the psychology of language, with presentations by APS President Susan Goldin-Meadow and others.

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Teaching Current Directions in Psychological Science

Featured articles: “When Anxiety Doesn’t Add Up: Understanding and Preventing Math Anxiety” and “Should You Trust Your Unconscious When Judging Lying? Probably Not!”

Employment Network

Association for Psychological Science
Science is a method of generating knowledge and testing beliefs; it trumps authority by empirical evaluation and depends on reliability and validity to uphold that knowledge. But science also is a human enterprise: Whether in psychology or neuroscience, physics or chemistry, studies are designed, conducted, and reported by people. Even with computer-controlled experiments, humans bear responsibility for the findings. When humans are involved, errors will occur. Some errors result from cognitive biases in decisions and judgment (Gilovich, Griffin, & Kahneman, 2002; Tversky & Kahneman, 1974), including confirmation bias (e.g., Nickerson, 1998); others occur by accident, oversight, or carelessness; still others may be motivated.

A “motivated” error occurs when results are at odds with reality and are produced with the intention of distorting or fabricating the analysis for reasons independent of objective evidence, whether because of conviction or gain (Broad & Wade, 1982). Diagnosing motivated error is difficult. Allegra Goodman’s novel Intuition (2006) illustrates how personal and professional motivations can muddy the waters of scientific knowledge when error occurs. Selective data reporting is a turning point in the novel. In much the same way, William Broad and Nicholas Wade (1982) discussed how Robert A. Millikan received the Nobel Prize for demonstrating quantal electrical charge, which he did by selective reporting. In the end, though, replication wins out as the natural scientific corrective process.

Psychological science has always been especially mindful of the tools of reliability and validity as a consequence of our intellectual history. Psychology moved from analytic introspection to intersubjective testability to develop a science relying on objective and systematic methodology. This methodology puts psychological science on the same objective footing as research in physical sciences. Acceptance of this regimen is why we object to the false distinction of putatively hard (e.g., physics) and soft (e.g., psychology) sciences. The scientific method establishes parity, and the target of understanding phenomena that are not directly observable — whether states of mind or dark matter — certainly does not cleave the sciences apart.

Although we’re well aware of the controversies over replication in psychological science, it is important to remember that all sciences suffer the same issues. Physics has dealt with controversies over cold fusion and faster-than-light particles, but ultimately scientific theory and replication led to clarity. However, replication is not always the answer. Consider Prosper-René Blondlot’s 1903 discovery of N-rays (Broad & Wade, 1982). This discovery, a physical phenomenon, was replicated by a physical process in hundreds of papers (Simon, 2014; Tretkoff, 2007), but in spite of replications, there were skeptics. A skeptical physicist visited Blondlot and by simple intervention showed that the only real phenomenon was observation bias.

APS Fellow Howard C. Nusbaum’s research focuses on the basic cognitive and neural processes of communication, learning, thought, and wisdom. Nusbaum is Director of the Chicago Center for Practical Wisdom, which supports basic research and facilitates discussions of the importance of wisdom research and understanding wisdom. He can be contacted via apsobserver@psychologicalscience.org.
When theory and knowledge impel replication, they can redress scientific error, but reliability and validity are not the same. Statistical analyses raise the question of whether some results are too good to be true (Francis, Tanzman, & Matthews, 2014). This kind of analysis essentially questions whether reported results are statistically plausible. The results do not indicate error as such but simply flag what appear to be improbable findings that might not be replicated.

This is not a problem for psychology alone and has arisen in genetics (Francis, 2014). Gregor Mendel’s data were also too good to be true (Broad & Wade, 1982; Gelman, 2012). But Mendelian genetics withstand the test of time. Statistics bolster an argument but do not represent the whole truth of a result. Given that there are many ways for errors to distort research and derail progress, we need to understand how social, cultural, and psychological forces work in science.

Science must generate believable and robust knowledge. The NSF Advisory Committee to the Social, Behavioral, & Economic Sciences Directorate (SBE) established a Subcommittee on Replicability in Science. Their report (Bollen et al., 2015) defined robust findings as reproducible, replicable, and generalizable with clear definitions. This report was a call to support new robust and reliable science, and SBE has posted a “Dear Colleague Letter” (DCL; Cook, 2016) announcing support for research on failures of robustness, methods to improve robustness, training to enhance robustness of research, and support for replications/generalizations of key SBE studies. Given that replicability concerns extend to other social sciences (Camerer et al., 2016), SBE is committed to improving robustness of SBE sciences. A DCL from the Directorate for Computer and Information Science and Engineering (Kurose, 2016) announces support for reproducibility in computing and communications research.

Science depends on credibility. There are, however, many ways that findings can fail replication, and not all compromise validity. Science requires humility given uncertainty and unknowns outside current research. The SBE DCL supports increasing robust research and greater reflection about robust science generally and hopes to lead to a wiser approach to research. The problem of robust science is not unique to the social and behavioral sciences; it inheres in all sciences and does so because all science is conducted by scientists — physicists and geneticists are human and thus subject to the social and psychological forces that can lead research astray. That alone creates a unique and important responsibility for understanding the conduct of robust science in the social and behavioral sciences.

### References


Scientists Explore How Nutrition May Feed Mental Health

Good nutrition has long been viewed as a cornerstone of physical health, but research increasingly is showing diet’s effect on mental health as well. A special section in Clinical Psychological Science highlights the different approaches that psychology researchers are taking to understand the many ways in which nutrition and mental health intersect.

Decades of research have shown the importance of proper nutrition in preventing and treating the ill effects of inflammation and stress, physiological processes that are intimately linked with mental health. Despite this clear connection, diet and metabolism typically do not feature in studies that examine aspects of psychological well-being.

“Nutrition is not mainstream within the sciences that study mental health and illness,” psychological scientist Alan Kazdin, who organized the Special Section during his tenure as Clinical Psychological Science Editor, notes in his introduction. “Standard coursework in training and exposure to the scientific literature in the traditional mental health professions omit even a morsel. A single series of papers cannot redress that. Yet we can make salient key questions and convey there are answers.”

The aim of this collection of articles is to “showcase the diversity of studies being conducted in a new, rapidly emerging field of nutrition and mental health,” write guest editors Julia J. Rucklidge (University of Canterbury, New Zealand) and Bonnie J. Kaplan (University of Calgary, Canada) in their introduction to the special section.

The five articles included in the special section investigate the intersection of nutrition and mental health from varying levels and perspectives.

Building on previous research showing the beneficial effects of a Mediterranean-style diet — rich in fruits and vegetables, healthy fats, nuts, and fish — Almudena Sánchez-Villegas (University of Las Palmas de Gran Canaria, Spain) and colleagues examine outcomes associated with a broader Mediterranean lifestyle that includes diet, physical activity, and social activity. Looking at data from 11,800 individuals participating in a university-based longitudinal study, the researchers found that all of these variables independently predicted a lower risk of depression. The article highlights the importance of examining the combined effects of nutritional and other lifestyle factors on mental health outcomes.

Jane Pei-Chen Chang (King’s College London, United Kingdom) and colleagues focus their research on another mental disorder: attention-deficit/hyperactivity disorder (ADHD). Examining data from 21 children with ADHD and 21 children without ADHD, the researchers find complex relations among children’s food consumption, physical symptoms, and cognitive performance. Although children with ADHD showed no difference in essential fatty acid (EFA) intake compared with their non-ADHD peers, they did show signs of EFA deficiency. At the same time, children who had lower EFA intake and symptoms of EFA deficiency were likely to show greater ADHD symptoms.

These findings raise the question of whether children with ADHD process nutrients in ways that differ from those of other children.

Focusing on potential nutritional interventions for obsessive-compulsive disorder (OCD), Jerome Sarris (The University of Melbourne, Australia) and colleagues examined effects of treatment with an amino acid agent called N-acetyl-cysteine (NAC) in a randomized controlled trial with 44 participants. The data showed no overall difference between NAC and placebo in reducing OCD symptoms, but subgroup comparisons indicated that younger participants and those who had been diagnosed for a shorter period of time were more likely to show improvement in response to NAC. The researchers suggest that further studies with larger samples are necessary to determine the utility of NAC as an adjunct to OCD treatment.

Joanna S. Lothian, Neville M. Blampied, and Julia J. Rucklidge, all of the University of Canterbury, New Zealand, explore broad-spectrum micronutrients (i.e., vitamins and minerals) as treatment for insomnia, a condition that is associated with a variety of mental health problems. In an 8-week trial, the researchers investigated outcomes associated with the use of a commercial micronutrient supplement in a group of 14 adults who reported symptoms of insomnia. Participants reported improvements with insomnia symptoms, mood, stress, and anxiety over the course of the trial. The researchers note several limitations — including the fact that participants were aware of the treatment and the study lacked a control group — that should be addressed in future research.

Investigating the relationship between inflammation and depression, Tasnine N. Akbaraly (INSERM, France) and colleagues examine data on diet and depressive symptoms collected from 4,246 adults over a period of 5 years. The researchers found that diets that rated high on the “dietary inflammatory index” were associated with increased risk of depressive symptoms, but only among women. Specific biomarkers of inflammation did not explain this association, despite their association with dietary inflammatory index scores at baseline.

Please visit the Special Section on Nutrition and Mental Health at http://cpx.sagepub.com/content/current#SpecialSeries-NutritionandMentalHealth.
Linehan Receives Grawemeyer Award for Psychology

APS James McKeen Cattell Fellow Marsha M. Linehan, whose groundbreaking research has focused on developing interventions for teens at high risk for suicide and support networks for their families and friends, has won the 2017 University of Louisville Grawemeyer Award for Psychology. Linehan’s award-winning Dialectical Behavior Therapy (DBT) is an evidence-based cognitive behavioral program that helps patients focus on mediating their behavior with coping skills.

Previous recipients of the Grawemeyer Award for Psychology include APS Past Presidents Elizabeth F. Loftus, Walter Mischel, and James L. McGaugh; APS Past Board Member Anne M. Treisman; APS William James Fellow and APS James McKeen Cattell Fellow Albert Bandura; APS James McKeen Cattell Fellows Aaron T. Beck and Irving I. Gottesman; APS William James Fellows Daniel Kahneman, Mortimer Mishkin, Michael I. Posner, Amos Tversky, David E. Rumelhart, and Leslie G. Ungerleider; and APS Fellows Marcus E. Raichle, Steven F. Maier, Antonio Damasio, Steven E. Petersen, and Lynn Nadel.

Linehan, who directs the Behavioral Research & Therapy Clinics, Center for Behavioral Technology, at the University of Washington, has worked for decades to develop rigorous clinical trials to study suicidal behaviors. In her award address at the 2015 APS Annual Convention in New York City she noted that, as of 2013, only 83 randomized clinical trials had been conducted to measure suicidal behavior. Furthermore, 23% of those trials excluded many of the individuals who most needed treatment, such as those with depression, anxiety, or bipolar disorder as well as those at high risk for suicide. Linehan has made it her mission to increase the amount of empirical research dedicated to patients with mental disorders by using robust study methods and by training graduate students to work with difficult cases early in their careers.

The psychological scientist has been open about how her own suicidality and depression have influenced her work. “At a young age, I vowed to get myself out of hell and then to go back and get others out,” she said in the press release announcing the award.

In addition to undertaking this daunting mission, Linehan has published seven books, including a widely employed handbook on DBT that has been translated into 10 languages. To see Marsha Linehan’s 2015 APS Award address, visit www.psychologicalscience.org/r/Linehan.

Major Change in NIH Policy for Clinical Trials Applications

In a significant departure from current practices, the National Institutes of Health (NIH) has issued new policies relating to grant applications involving clinical trials, including one (http://grants.nih.gov/grants/guide/notice-files/NOT-OD-16-147.html) mandating that all applications involving clinical trials must be in response to a Funding Opportunity Announcement (FOA) specifically designed for clinical trials. The changes will affect applications submitted on or after September 27, 2017.

This policy change will have a clear impact on the application process for psychological scientists, given that the NIH definition of a clinical trial (see http://grants.nih.gov/grants/guide/notice-files/NOT-OD-15-015.html) includes all research involving one or more human subjects who are prospectively assigned to one or more interventions (that may include placebo or other control) to evaluate the effects of those interventions on health-related biomedical or behavioral outcomes. Investigator-initiated applications involving clinical trials will no longer be accepted by NIH; instead, applicants seeking to conduct clinical trial research must find an FOA that specifically allows the submission of clinical trials and covers an area of scientific interest relevant to the proposed research. NIH will no longer accept clinical trial applications through Parent Announcements (broad funding opportunity announcements for investigator-initiated applications) or other FOAs that are not specifically designed to accept clinical trials. Each NIH Institute and Center (IC) will be required to publish its own clinical trials FOA, which will emphasize that IC’s scientific area(s) of interest.

While NIH is making these changes in an effort to “to identify more easily clinical trial applications and ensure that key components of clinical trial information are included and uniformly considered in review,” vigilance from the scientific community is needed to ensure that all areas of science are represented in the IC-specific FOAs involving clinical trials research.

Loftus Receives 2016 John Maddox Prize

APS Past President Elizabeth F. Loftus has been awarded the 2016 John Maddox Prize, which honors scientists who have shown courage in promoting science on a matter of public interest in the face of difficulty or hostility. The award, named after the late Nature Editor Sir John Maddox, recognizes Loftus for her groundbreaking studies on false memory and the unreliable aspects of eyewitness testimony.

Loftus’s research, which in the 1990s challenged many people’s claims of repressed memories of childhood abuse, resulted in efforts to undermine her career and even threats to her life.

“Standing up for psychological science in general, and research on memory in particular, has brought a good deal of hostility my way,” Loftus acknowledges in her comment on the prize’s webpage. “Receiving this honor helps to erase the pain of insults, death threats, and lawsuits. And I love that idea that, forever, my CV will contain the name of the late Sir John Maddox, whom all respect for his tireless defense of science.”

Loftus’s 40-plus years of research have gained her some of the field’s most prestigious accolades and garnered her popularity unheard of for most psychological scientists. She appeared on The Oprah Winfrey Show; her TED Talk, “How Reliable is Your Memory?,” has more than 3 million views; and she has served as an expert witness in hundreds of court cases, including the high-profile criminal trials of Martha Stewart, Ted Bundy, and O. J. Simpson.

Loftus’s pioneering work on the “misinformation effect” has illuminated for the field aspects of human memory that many were unwilling to accept. In a Frontline interview with PBS, she explained the three words she would use to describe human memory: “suggestive, subjective, and malleable.”

Loftus has published 23 books and over 200 articles on her research, with titles such as “The Myth of Repressed Memory: False Memories and Allegations of Sexual Abuse,” “Witness for the Defense: The Accused, the Eyewitness and the Expert Who Puts Memory on Trial,” and “Eyewitness Testimony: Civil and Criminal.” She is an APS William James Fellow and APS James McKeen Cattell Fellow, and her other honors include the Grawemeyer Award, the Distinguished Contribution to Basic and Applied Scientific Psychology Award, the William T. Rossiter Award for “exceptional global contribution to the field of forensic mental health,” and many more.

To go Inside the Psychologist’s Studio with Elizabeth Loftus, please visit http://www.psychologicalscience.org/video/elizabeth-loftus-itps.html#.WEgsiLIrJaQ.
Two Priming Effects to be Examined in APS Registered Replication Reports With Combined Protocol

APS announces two new Registered Replication Report (RRR) projects. Data for these two projects will be collected concurrently as part of a single protocol, and participating laboratories will be listed as authors on both reports. These reports will be published in APS’s new journal, *Advances in Methodologies and Practices in Psychological Science*, and they will replicate Experiment 1 from:


In the 2008 study, Nina H. Mažar (University of Toronto, Canada), On Amir (University of California, San Diego), and Dan Ariely (Duke University) showed that a quick and simple moral reminder significantly reduced cheating. Participants were given a problem-solving task and an incentive to perform well. Those participants in the critical “cheat” condition were given an opportunity to report solving a greater number of problems than they actually did, with no risk of being caught. When those participants were primed with a moral reminder (to recall the Ten Commandments) versus a neutral reminder (to recall 10 books they read in high school) before completing the task, the morally primed subjects reported solving 28% fewer problems. According to the authors, “the level of dishonesty dropped when people paid more attention to honesty standards” (p. 642).

Several labs have conducted studies extending this concept of religious and moral priming, and the influence of priming on honesty has been examined in a variety of contexts. However, a direct replication of the Mazar, Amir, and Ariely (2008) study has never been published, and some recent studies have not found moral or religious priming to have an effect on subsequent deceptive behaviors. The proposers of the replication, Bruno Verschuere (University of Amsterdam, the Netherlands), and Ewout Meijer (Maastricht University, the Netherlands), hope that a large, multicenter direct replication of this study will help to provide clarity regarding moral priming.

The task in Mazar, Amir, and Ariely’s study was administered as a part of a larger battery of tests in a large classroom setting, conditions that must be met by the RRR study as well. This provides an opportunity to conduct another RRR as part of that battery. The second RRR will examine Thomas K. Srull (University of Illinois at Urbana-Champaign) and Robert S. Wyer’s (Hong Kong University of Science and Technology, Hong Kong) seminal 1979 study.

In that study, the authors examined the so-called assimilation priming effect by first asking subjects to descramble sentences that described either hostile or neutral behaviors. When subjects subsequently read a vignette about a man whose behaviors were ambiguous in their hostility, those who had been primed with more hostile sentences judged these ambiguous behaviors as more hostile and rated the man as more hostile as well.

Although the effects of “hostile priming” have been conceptually repeated in many experiments, recent concerns over the replicability of some social priming studies — including ones using sentence descrambling as a prime — inspired Randy J. McCarthy and APS Fellow John J. Skowronski, both of Northern Illinois University, to propose a large-scale replication to measure the true size of this effect.

Researchers can learn more about the project at its Open Science Framework page (https://osf.io/vxz7q/), which includes the full protocol and all of the experimental materials. If you have any questions about this RRR or the RRR process in general, you can email the RRR editors at replicationreports@gmail.com.
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Presents

Improving the Reproducibility of Our Research Practices Using Open Science Framework

With:

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

Courtney Soderberg
Statistical and Methodological Consultant
Center for Open Science

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

Chapter 1: Introduction
Chapter 2: Setting Up a Collaborative Research Space
Chapter 3: Pre-Registration and Pre-Analysis Plans
Chapter 4: Documenting Your Research Project
Chapter 5: Sharing Your Work
Chapter 6: Incentives for Behavior That Research Can Take Advantage Of

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

Presented with support from SAGE Publications
Finding Common Ground Between Classic Learning Theories

APS Past President Gordon H. Bower is a pioneering psychological scientist and a National Medal of Science winner — but even luminaries like Bower have their mentors. In the APS–Psychonomic Society W. K. & K. W. Estes Lecture at the 2016 APS Annual Convention in Chicago, Bower spoke about his relationship with the late William K. Estes and his work to build on Estes’s theories, a journey of both personal and scientific gains.

Estes himself was a pioneer in mathematical psychology, a National Medal of Science winner, and the Founding Editor of APS’s flagship journal, *Psychological Science*. His wife, Katherine “Kay” W. Estes, was the Founding Managing Editor of the journal.

During his address, Bower described time he spent relating Estes’s research to that of influential learning theorist Clark L. Hull. Bower discussed his time in graduate school at Yale University, where Hull’s *stimulus–response theory* was regarded as the major theory of learning and memory at the time. But when Bower met Estes during a workshop at Stanford University, he brought back to Yale a newfound appreciation for Estes’s theory of learning, called the *stimulus sampling theory*. Bower soon became committed to bridging the gap between these two theories.

According to Bower, Hull’s theory arose from psychology’s behaviorism movement as an attempt to determine fundamental principles of learning arising from hundreds of studies being conducted on animal conditioning. Hull believed that researchers could summarize the effect of learning conditions to obtain a measure called *degree of conditioning*. Hull’s degree of conditioning was defined as a product of habit strength due to past training, the distinctiveness or intensity of the conditioned stimulus, the animal’s relevant motivation level, the magnitude and the quality of the reward, and the delay of the reward following the response.

“Hull always viewed his set of principles not as an end in themselves but as the basis for deriving explanations for many other behavioral observations,” said Bower.

On the other hand, Estes’s theory was more abstract, Bower said. According to Estes, learning gave rise to “a large population of dozens of little stimulus aspects … called stimulus elements.” On any given learning trial, only a sample of these elements are noticed — kind of like drawing marbles from a bag. When a majority of these marbles are associated with a certain response, the response occurs. Learning increases as these stimulus elements become more and more associated with certain responses.

Estes posited that stimulus aspects arise from various factors such as the experimental apparatus used, subjects’ internal states, and extraneous stimuli not associated with any outcome.

Over the course of his talk, Bower described in great depth the apparent differences between the two theories and how, via a process of careful translation, the two theories give rise to virtually identical mathematical equations, bridging the gap between the two theories, and, according to Bower, putting Estes’s stimulus sampling theory “on an equal footing with the theories of Hull and [Edward] Tolman that were so dominant in those waning days of the grand learning theories.”

Eventually, Bower and his colleagues moved on from his theory-bridging efforts to other topics.

“Although such speculations might have been noteworthy at the time, I never published any of it and Bill published only a little bit … in retrospect, the speculations are very much confined to their historical time capsule. Moreover, beginning in 1960, Bill and I both joined the cognitive revolution and essentially moved on to studies of human memory and category learning.”

Bower ended his talk by reflecting on the personal importance of the time he spent working with Estes, noting that Estes’s mentorship fostered his strong interest in mathematical psychology.

“Not only was [Estes] a superbly creative scientist, he had an enormous impact on our field. I feel lucky to have known him so well for so many years,” he finished.


Lastly, if you wish to donate to the W. K. & K. W. Estes Fund, please visit www.psychologicalscience.org/fund-new/index.cfm?FundID=WKKW.

-K. Andrew DeSoto
Harnessing the Wisdom of Crowds to Improve Hiring

By Alexandra Michel

At least as far back as the 19th century, statisticians found that groups of people are capable of making a more accurate decision than any single individual. Yet organizations rarely take advantage of this “wisdom of the crowd” to improve operations.

In a new program, behavioral scientists at the Behavioural Insights Team (BIT) in the United Kingdom are harnessing the decision-making power of groups to improve the way that organizations conduct hiring. Originally commissioned under Prime Minister David Cameron in 2010, the BIT is a leading example of government testing of public and organizational policy interventions through evidence-backed collaborations with behavioral scientists. Across a series of experiments, the BIT has been investigating how findings from behavioral science can be used to help organizations, including the BIT itself, improve hiring practices.

“Organisations spend eye-watering sums trying to attract the best talent because in many industries, the difference between the best and the good has real implications for the bottom line,” BIT behavioral scientists Kate Glazebrook, Theo Fellgett, and Janna Ter Meer write in a BIT blog post.

The team’s first set of experiments on innovating hiring practices was inspired by a nearly 200-year-old statistics experiment. The English statistician Francis Galton famously asked 800 townsfolk at a county fair in Plymouth, England, to guess the exact weight of an ox down to the pound. Guessers wrote their estimates on bits of paper, which Galton then analyzed. Galton had hypothesized that “oxen experts” such as farmers and butchers would have the best estimates, but the crowd proved this assumption wrong: The group’s estimate was more accurate than the individual guesses from experts.

Galton was shocked by the results: The median of all 800 guesses was extremely close to the exact weight of the ox. The group estimate was 1,197 pounds, and the actual weight of the ox was 1,198 pounds — a difference of just 0.08%.

This “wisdom of the crowd” demonstrated that, under the right conditions, groups of people can make more insightful decisions than individuals can, sometimes even besting the experts. Glazebrook and colleagues suspected that integrating more people into the hiring process could similarly improve the chances of picking out the best possible candidates from the pool of applications.

Many hiring decisions come down to superficial criteria, such as choosing to interview only graduates from certain universities or unconsciously favoring candidates based...
on traits like gender, ethnicity, or sexual orientation. By focusing on these perfunctory traits, organizations may miss out on highly qualified candidates. Additionally, these kinds of homogenous hiring practices can lead to situations in which employers miss out on the benefits that come from a diversity of perspectives. When everyone addresses problems in the same way (i.e., “groupthink”), teams can end up missing major concerns altogether.

Although companies are increasingly aware of the benefits of a diverse workforce, actually translating these goals into hiring practices has been a challenge. The BIT wanted to find out whether they could build better, more diverse teams by adopting a hiring strategy that could take advantage of the wisdom of crowds.

“One area of crucial importance to almost all organisations is recruitment, but research shows that a whole host of implicit biases result in suboptimal hiring decisions,” the BIT explains in their 2016 report. “Studies have shown that organisations are more likely to offer job interviews to candidates with ‘white-sounding’ names. Recruiters make snap judgements about individuals in interviews, and structure recruitment processes (e.g. sending a cover letter and CV) in ways that give too much weight to factors (gender, race, social class) that should be irrelevant to an individual’s ability to do a role.”

Research from APS Fellow Philip E. Tetlock (University of Pennsylvania) has demonstrated that people are better at forecasting outcomes when they work together in collaborative teams. Tetlock and colleagues have spent years studying decision-making and expertise. One of their key findings has been that pooling multiple perspectives can counter the cognitive biases that lead to bad decisions. The BIT drew on Tetlock’s research to help inform their own approach to bias in hiring.

“In fact, researchers have even shown that US defense intelligence analysts with access to classified information can be beaten by some rudimentarily-educated amateurs: largely because they come to conclusions too quickly and struggle to update their opinions in the face of new and conflicting information,” Glazebrook, Fellgett, and Ter Meer explain in their BIT blog post.

Research also suggests that people with varied backgrounds and experiences will tackle problems differently, and this diversity of perspectives can help organizations make better decisions.

A team of psychological scientists led by APS Fellow Adam D. Galinsky (Columbia University) recently summarized empirical arguments for more diverse teams in Perspectives in Psychological Science: “Homogeneous groups run the risk of narrow mindedness and groupthink (i.e., premature consensus) through misplaced comfort and overconfidence. Diverse groups, in contrast, are often more innovative and make better decisions, in both cooperative and competitive contexts.”

So when it comes to reviewing resumes and interviewing applicants, how big does the crowd need to be to maximize the benefits?

The BIT designed a simple online experiment in which approximately 400 reviewers rated four hypothetical job candidates based on responses to a generic recruiting prompt (i.e., “Tell me about a time when you used your initiative to resolve a difficult situation.”). The reviewers were given a set of guidelines, similar to those given to conduct a structured interview, to help them assess the quality of responses.

The 400-person crowd had a clear favorite and easily identified the best candidate response.

“We took our data and ran statistical simulations to estimate the probability that different groups could correctly select the best candidate,” Glazebrook and colleagues explain. “We created 1,000 combinations of reviewers in teams of different sizes, ranging from one to seven people. We then pooled them by the size of the group and averaged their chance of selecting the right candidate.”

When there was a gap in quality between the best and second-best responses, an individual picked the less qualified person approximately 16% of the time. However, with a group of three decision-makers, the odds of choosing the lesser candidate dropped to 6%, and with a five-person group, the chance decreased to 1%. When the two candidates were very similar, individuals selected the best candidate approximately 50% of the time — basically, they had the same accuracy as tossing a coin. A crowd of seven, on the other hand, picked the superior candidate more than 70% of the time.

Of course, polling 400 reviewers for every job isn’t very practical. Ultimately, the evidence suggested that three reviewers was the optimal crowd size for recruitment, but more experiments are still in the works.

Turning the Science Inward

“The Behavioural Insights Team likes to live by its own principles. When we examined the literature on how organizations can improve their internal practices, we realized we had to apply them to BIT as well,” the team explains.

To this end, the BIT has developed a platform called Applied. The goal of this project is to use findings from behavioral science to reduce the role of bias in the hiring process.

Most job searches start with an applicant submitting their resume or CV along with a cover letter. Someone in human resources then sorts through the pool of applicants, narrowing it down to a set of individuals who will be invited for an interview. But the small experiment described above simply doesn’t support the standard CV sift as a particularly useful hiring tool. For example, a candidate with a degree from a prestigious private university on his or her CV may be chosen over someone equally qualified who attended a state university, or a candidate with a typically masculine name may be assumed to have greater leadership potential compared with a female job candidate.

With respect to CVs in particular, research argues that CVs typically contain information that is largely irrelevant to a candidate’s performance on the job. Nevertheless, this information has the potential to prey on the unconscious biases of the assessor,” the BIT explains in their 2016 report.

The Applied platform attempts to increase quality and diversity in hiring through implementing four key
features: anonymization, chunking, collective intelligence, and predictive assessment.

First, the platform anonymizes applications by scrubbing irrelevant information such as names (which can provide cues about an applicant’s gender, race, age, or ethnic background). The applications then are organized by “chunking” — instead of reading through one full application at a time, reviewers compare a specific question from an application with the same question from other applications. This helps reviewers to identify the overall best responses.

Last, three or more people review the remaining pool of applicants. Agreement of multiple reviewers helps ensure that the best possible candidate is ultimately chosen. Job assessments and situational work tests are chosen based on whether there’s evidence showing that specific tests are “genuinely predictive of performance on the job.”

The Applied platform isn’t just for private organizations and businesses: The BIT has used the platform to improve their own hiring practices.

Can You Take the Bias Out of Hiring?

In an experiment to determine whether Applied was doing what it was supposed to, BIT researchers tested the platform against a more traditional “CV sift” during their own 2015–2016 graduate recruitment period.

First, the team designed a parallel A/B test of the 160 candidates who had the best performance on an initial multiple-choice test. The application materials for all candidates were sent through both the automated Applied review and the normal “sift” from a senior HR manager who reviewed CVs and resumes. The resulting pool of successful candidates was then sent through a rigorous set of skill assessments and final in-person interviews.

Ultimately, this process gave applicants two shots to get hired: They could make it through the traditional review process based on an exceptional CV, or they could be chosen based on the scores from the evidence-based hiring tests used by Applied.

“When we pulled all of the data in, lots of things surprised us,” Glazebrook and Ter Meer write in a post on Medium.

There was no correlation between the score for an applicant’s CV and in-person performance in later rounds. Simply having an impressive CV with recognizable schools and fancy titles was a weak predictor for test scores during the other assessments. There was, however, a significant, positive relationship between the Applied scores and the two in-person interview rounds — that is, people with high Applied scores on their application materials also performed well in person.

But did Applied actually come through on delivering a more diverse set of hires? While there wasn’t a significant difference between the two hiring groups on gender, there was evidence that Applied was less biased against people with a disability and people from non-White backgrounds, although the sample sizes were too small to provide a statistically significant conclusion for these measures.

There was a marked difference in the role of educational background between the two groups. While the CV sift favored applicants based on formal educational attainment, those who made it through the Applied sift had a much more diverse educational background — that is, the people who had the most years of higher education didn’t necessarily have the best skills for the job. This finding is in line with trends from companies like Google and IBM, where formal college education or university grades increasingly are viewed as irrelevant predictors of someone’s performance on the job.

“We would never have hired (or even met!) a whopping 60 percent of the candidates we offered jobs to if we’d relied on their CVs alone,” Glazebrook and Ter Meer write.

Of course, more evidence is required to demonstrate that this hiring approach will actually translate into on-the-job performance. The cohort of hires at Applied is too small to use as a meaningful test of the platform’s capabilities in the real world, but the Applied team is looking for opportunities to run a larger test.

On a national scale, the use of this kind of bias-limiting approach could have an enormous impact on helping individuals get the jobs for which they’re qualified. As Glazebrook and Ter Meer explain, “even if 1 in 5 candidates were given jobs that they otherwise wouldn’t have, across the economy, that’s hundreds of thousands of people getting jobs they otherwise wouldn’t have based on merit.”

References


The University of Louisville Grawemeyer Awards program is proud to announce the 2018 award in Psychology. This award recognizes outstanding ideas in all areas of Psychological Science. The award is designed to recognize a specific idea, rather than a lifetime of accomplishment. Nominations are judged on the basis of originality, creativity, scientific merit, and breadth of impact on the discipline.

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

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

Send Nominations (by mail, fax or email) no later than February 28, 2017 to:
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University of Louisville
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E-Mail: grawemeyer.psychology@louisville.edu
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What Do We Want Our Scientific Discourse to Look Like?
A discussion curated by Alison Ledgerwood

We have seen a lot of changes in the field of psychology over the last few years, including changes to the way we talk about our science. New developments in technology have opened opportunities for faster, more flexible, and more broadly accessible communication between scientists than ever before. Journal articles, conference symposia, and in-person conversations about research and research methods now are complemented by numerous online blogs, Facebook discussion groups, email chains, and Tweets. As we embrace the possibilities afforded by these new modes of communication, it is perhaps an ideal time to ask: What do we want our scientific discourse to look like? Going forward, how can we not only build a better science, but also build better ways of talking about science?

I posed this question recently on PsychMAP, a lightly moderated Facebook discussion group devoted to discussions of psychological methods and practices with over 4,000 members from around the globe. Here are some of the themes that emerged.

1. Focus on the ideas, not the person.
Several contributors emphasized the importance of focusing scientific discourse on ideas rather than on individuals. Simine Vazire of the University of California, Davis, wrote (and many agreed) that she wishes “we would judge scientific claims more on the basis of the strength of the evidence or of the arguments than on who the author/speaker is. (How social media helps/hurts that goal is something we could debate all day, but I’d personally rather focus more on how we can reduce the influence of status bias in our scientific discourse, online and offline, in journals and in more informal settings. And I say that as someone who is a beneficiary of this bias.)”

Richie L. Lenne of the University of Minnesota added, “We would serve each other, and science as a whole, better if we treated critique and communication of science as an open and humble process of discovery and improvement. This is easier said than done. Criticisms of the science are often construed as criticisms of the scientist. Even when we, as scientists, appreciate the criticism and recognize its scientific value, it still evokes concerns that others will lose trust in us and in our research. It is no wonder people are distressed by methodological criticism. However, focusing our discourse on methodology and evidence, with more awareness of how tone and context influence others’ perceptions of the scientist whose work is under the microscope, will help ensure healthy development of our science.”

2. Promote inclusivity by attending to power.
If we want our scientific discourse to be inclusive, we need to pay careful attention to power dynamics. Rickard Carlsson of Linnaeus University, Sweden, wrote, “I think the concept of power is important. One can feel low in power in discussions because of gender, race, research position, rank of university, SES, not having English as native language and many other things. … It’s not easy to get all [of the] voices at once. Therefore, I suggest that this type of initiative [i.e., discussing what we want our scientific discourse to look like] shouldn’t be a one-time event but regularly revived and reevaluated.”

Lenne elaborated on this theme: “As a graduate student, I feel vulnerable publicly stating my thoughts on criticism and openness in science, which speaks to the climate of our discourse. It is essential that we have a communication environment in which graduate students, postdocs, and junior faculty from all backgrounds are rewarded for humbly and openly presenting methodologically sound ideas, research, and criticisms.”

An anonymous contributor added that in the best version of scientific discourse, “thoughtfully expressing scientifically based disagreement with someone who happens to be more powerful would neither … be risky for one’s career, nor [constitute] a free pool of ideas for personal use without needing to acknowledge the source or collaborate should that be warranted. Of course, that can be utopian, but at least the willingness to take all voices seriously as a default would be one step forward.”

The fact that power dynamics evolve and change over time means that they aren’t something we assess and address once — instead, we need to continually evaluate who has power and who doesn’t, who is included and who is not, and how we

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can work within the current context to help level the playing field. For instance, Christian S. Crandall of the University of Kansas highlighted the temporary power dynamic that can emerge when many people criticize a single individual, pointing out that "some individual posts of argument, questioning, or contradiction on their own are not uncivil, but taken as a group they can be overwhelming.”

Meanwhile, Jennifer R. Overbeck of the Melbourne Business School, Australia, wrote, "Right now, we’re seeing a transition from a system where scholars gained status and privilege (and thus power over funding, journal access, and defining ‘value’ and ‘quality’) through ferocious productivity, sexy findings, placement at top schools, and prestigious social networks to a system where previously marginalized advocates of rigor have used expertise, alliances, control of resources, and control of communications media to rapidly become powerful themselves. It’s no surprise that struggles for control and legitimacy should erupt between the ‘old guard’ and the ‘new guard.’”

But to fully grapple with the question of who has power and who does not, we need to take an even broader look. Overbeck continues, "What about those whose institutions, ranks, reputations, resources, networks, etc., leave them without power in either system? A new emphasis on quality could be of huge value in helping such scholars and their high-quality work achieve recognition. Yet a new atmosphere of confrontation and, at times, personalized attacks could intimidate them and make the enterprise seem so risky that it’s safer just to withdraw. Seeing oneself as an outsider–insurgent may give rise to behavior (like social media ‘hot takes’) that are experienced very differently by those who see the behavior as an exercise of power. At some point, the revolutionaries become the establishment, and establish more important, I think it is important that such critiques are not delivered with condescension. Instead, we need to recognize that the other person is probably seriously trying their best to deliver good work, but may not have learnt the techniques we are familiar with, or [may] have a different opinion about what good science is. … Honest dialogues about methods in which both parties listen to each other and take each other seriously are crucial (even if they think the other party is wrong).”

Echoing the importance of assuming good intent on the part of others, APS Fellow Roger S. Giner-Sorolla of the University of Kent, United Kingdom, noted that “civil discourse in science means assuming that everyone is trying to find the truth, that their errors are only errors, and refraining from implying other motives even if you suspect them to be true.”

Meanwhile, Carolin Schuster of the University of Passau, Germany, pointed out that “civil discourse — that is, willingness to accept feedback, openness for changing assumptions, and sharing knowledge (and data) — requires a spirit of cooperation, not competition,” and suggested that incentives for group products rather than individual products might help promote a more collaborative science.

Amy Summerville of Miami University elaborated on the importance of a collaborative approach that emphasizes learning from each other: “For me, it’s helpful to consider discussions about methods and practices as an extension of the teaching and learning I do in the other parts of my job. I think most teachers, when providing feedback to their students on their weaknesses, try to focus on the specific error and how the student can improve … rather than saying things like ‘idiots like you are why our class discussions are so terrible.’ (At least, I certainly hope we do!) Likewise … we hope our students will try to use feedback to do better in the future and ask for help doing so, rather than try to argue point by point why their grade was totally unfair. My goal for our scientific discourse would be for each of us to be a compassionate teacher and be a teachable learner.”

Finally, Hanne M. Watkins of the University of Pennsylvania cautioned against taking an oversimplified view of the current state of the field that divides scholars into camps: “An unfortunate ‘us vs. them’ mentality seems to have developed, with many on both sides contributing to the polarization. The human propensity to form groups and develop ingroup biases is pretty well established, so it’s not surprising that an ‘old’ vs. ‘new’ heuristic has developed in this context as well, with some people clearly being on one ‘side’ or another. But I’m sure there are lots of people, like me, who don’t feel comfortable ‘picking sides,’ and would rather focus on our superordinate identity as psychological scientists.”

As psychological scientists, then, let’s unite in our shared goal of constantly striving toward both a better science and a better scientific discourse. What should that discourse look like, and what's the best way to get there? The views here offer some important ideas that are well worth considering. But of course, this discussion is and should be ongoing and constantly evolving. Let’s keep challenging ourselves to assess and improve our scientific discourse and to bring an ever-broader range of psychological scientists to the table as we do so.
FIVE Myths About the Role of Culture in Psychological Research

By Qi Wang
A few months ago, I met with a new colleague of mine who does brilliant research on perception. Hearing about my interest in culture, she admitted that she never looked at culture or gender in her research because she studies basic perceptual processes that are not supposed to differ across human groups. I told her about the many exciting findings on perception in cross-cultural research, and that we found cultural differences in the very perceptual phenomenon she studies. She was stunned and intrigued, and we had a wonderful and exciting conversation. A few days later, I received an email from her: She was submitting an amendment to our institutional review board to collect information about participants’ ethnicity and gender in her studies. Two months later, I heard from her again: She asked me if I’d be interested in collaborating on a project to examine the influence of culture on perception and memory. We subsequently submitted a grant application together.

My colleague is one of many researchers who are curious about culture and who face an increasingly diverse world around them, meaning they can expect to work with increasingly diverse participant pools. For those researchers, the important question is how to incorporate culture into their research so that they are not continuing to ignore the cultural backgrounds of their participants.

Twenty years of cultural research that my colleagues and I have done on the development of social cognition, including autobiographical memory, future thinking, the self, and emotion knowledge, illustrate how cultural psychological science can provide unique insights into psychological processes and further equip researchers with additional tools to understand human behavior.

There are five assumptions that often distract or discourage researchers from integrating cultural factors into their work, and I aim here to deconstruct them.

**Assumption 1. Cultural Psychological Science Focuses Only on Finding Group Differences**

This understanding of what cultural psychological science can do is far from being complete. In our research, my colleagues and I have learned how culturally prioritized self-goals guide autobiographical memory. Autonomous self-goals, prioritized in Western, particularly European American, cultures, motivate individuals to focus on and remember idiosyncratic details and subjective experiences that accentuate the individual. In contrast, relational self-goals like those prioritized in East Asian cultures motivate individuals to attend to and remember information about collective activities and significant others.

By experimentally manipulating self-goals of autonomy and relatedness, we are able to make European Americans recall socially oriented memories as East Asians usually do, and make East Asians recall self-focused memories as European Americans usually do. In a study I conducted with APS Fellow Michael A. Ross, University of Waterloo, Canada, we asked European American and Asian college students to describe themselves as either unique individuals (i.e., autonomous-self prime) or as members of social groups (i.e., relational-self prime). We then asked them to recall their earliest childhood memories. In both cultural groups, those whose autonomous self-goals were activated prior to the recall reported more self-focused memories, whereas those whose relational self-goals were made salient recalled more socially oriented memories.

As this line of work illustrates, cultural psychological science is about not just what differences exist between cultures, but, more importantly, why and how those differences exist.

**Assumption 2. Cultural Psychology Disregards Group Similarities**

For people with this assumption, a cross-cultural psychological study that finds no cultural differences is considered a failure. But group similarities often tell us that a psychological construct or process may be closely tied to biological constraints or shared cultural experiences.

Our research on the development of future thinking is an example. Children’s ability to travel mentally in time to anticipate future happenings develops rapidly over the preschool years and beyond, although children still rely on general knowledge to think about the future. There are also cultural influences: European American family practices encourage children to dwell on and articulate details of their personal experiences and plans, which directly facilitates their ability to represent event-specific details. In contrast, Chinese parents, when discussing personal experiences with their young children, tend not to focus on individual details of the event but rather to emphasize general rules and expectations. In line with the differing practices, we have observed that European American children often produce more specific details than do Chinese children when recalling past experiences. Given the intimate connection between remembering the past and imagining the future, this cultural difference should be paralleled in children’s representations of future events.

My colleagues and I asked 7- to 10-year-old children and college students from European American and Chinese cultural backgrounds to imagine and describe future personal events that would occur at a particular time and place. We then coded the protocols using a standard scoring procedure that distinguishes between specific details (e.g., actions, people, and locations) and general references (e.g., facts and metacognition). We found that children of the two cultures relied similarly on general references relative to specific details in their event representations, yet they did so to a greater extent than did adults. However, European American children and

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adults generated more specific details than did Chinese children and adults in their representations of future events. These cultural similarities and differences together suggest that the development of future thinking reflects the interaction between cognitive neurological growth and sociocultural influences, a process contributing to both universality and cultural diversity.

Making informed hypotheses about cultural similarities will help researchers make decisions about research design, sample selection, and statistical strategies for effective testing for equivalence and subsequently help them obtain interpretable findings. Cultural similarities may suggest universality in the underlying biological cognitive mechanisms on the one hand, and shared human conditions and life circumstances on the other.

**Assumption 3. Cultural Psychology Concerns Only Group-Level Analysis**

Yes, research in cultural psychology often involves comparing groups or cultures, but it by no means downplays the importance of individual differences. On the contrary, examining individual differences is not only important but often necessary to uncover the factors that account for the observed cultural differences. Our research on emotion knowledge and the development of autobiographical memory can serve as an example.

One important component of emotional cognition concerns the semantic knowledge of emotionally salient events or situations, including happy events such as holidays and birthday parties and sad occurrences such as the loss of a loved one. This component is often referred to as emotion situation knowledge or emotion memory. Our research suggests that the great emphasis on raising “emotionally intelligent” children in European American culture directly facilitates children’s developing emotion knowledge. Chinese culture, in contrast, places far greater emphasis on external behavior than on inner psychological states. Consequently, when asked to judge the emotional nature of story situations or to describe situations likely to provoke various emotions, European American preschoolers outperform their Chinese peers regardless of age, and they make more rapid progress in emotion knowledge over time.

Paralleling this cultural difference in emotion knowledge, our studies have consistently shown that when asked to recount autobiographical events (e.g., one thing the child did recently that was special and fun), European American preschoolers often recall more specific episodes (e.g., “getting a new toy”) as well as more specific details from those episodes. Chinese children, on the other hand, tend to report more general routine events (e.g., “playing with a toy every day”) and fewer event-specific details. Thus, there appears to be a connection between emotion knowledge and autobiographical memory at the group level.

In a longitudinal study, my colleagues and I confirmed that, at the group level, European American children showed overall greater understanding of emotion situations and also recalled more detailed autobiographical memories than did mainland Chinese and Chinese American children across the preschool years. More importantly, at the individual level, children who exhibited greater emotion knowledge early on recalled memories with more specific details both concurrently and longitudinally, regardless of culture. Furthermore, emotion knowledge functioned as a potent mediator that accounted for cultural differences in memory recall.

Thus, by following up on our initial group-level analysis, we were able to identify an individual-level mechanism responsible for early memory development. Had we neglected the parallel cultural differences in emotion knowledge and autobiographical memory in the first place, we might not have considered emotion knowledge to be a candidate mechanism for autobiographical memory and might not have made the subsequent investigation.

Situational factors also can influence the impact of culture within an individual. For instance, when Asian American college students thought of themselves as being American, they recalled more self-focused memories, whereas when they thought of themselves as being Asian, they recalled more socially oriented memories. Similarly, when bilingual Hong Kong Chinese children spoke in Chinese, they endorsed more strongly interdependent values, exhibited greater relational self-goals, and recalled more socially oriented memories than they did when speaking in English. These within-group and within-individual processes highlight psychological functioning as a joint product of the individual and the cultural agenda of the community.

**Assumption 4. Cultural Psychology Is Irrelevant to Basic Psychological Processes**

Many “basic” psychological processes and constructs for which culture is typically assumed to be irrelevant, such as neuronal functioning, sensation, visual illusions, face processing, and color perception, have been shown to be sensitive to cultural influences. Even simple taste preferences are subject to local community practices rather than being part of human genetic composition as commonly assumed. Whereas Indian medical students show the same pattern of preferences as Westerners do, favoring sweetness and finding concentrated sourness and bitterness to be unpleasant, Indian laborers from the Karnataka region have high preferences for sour and bitter tastes.

One of the most important findings in perceptual psychology, as relevant to autobiographical memory, is the phenomenon of event segmentation, an automatic perceptual process that separates “what is happening now” from “what just happened.” APS Fellow Jeffrey M. Zacks, cognitive psychologist Khena M. Swallow, and colleagues have conducted extensive research on this phenomenon. Data from their behavioral and neuroimaging studies have shown that when presented with a continuous stream of information, people spontaneously segment the information into discrete meaningful events. These event segments subsequently form the units of encoding and determine what people remember. Event segmentation is therefore a naturally occurring human perceptual mechanism that makes memory for everyday events possible, and has been generally assumed (albeit implicitly) to be insusceptible to cultural influences.

Yet findings from cultural psychology have suggested otherwise. APS William James Fellow Richard E. Nisbett and colleagues have shown that Asians often engage in holistic

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perceptual processing, attending to relationships and similarities among diverse objects and events, whereas Westerners tend to engage in analytic perceptual processing, focusing on salient features of individual objects and events. These distinctive perceptual styles reflect cultural differences in the basic allocation of attention during stimulus processing. They are further supported by the characteristics (e.g., complexity, ambiguity) of the physical environments in respective cultures and are sustained by neural mechanisms. Conceivably, the holistic processing of information in Asians may lead them to view different objects and events as interrelated. As a result, they may perceive fewer discrete episodes in a continuous flux of information and thus segment the information into a smaller number of meaningful units. In comparison, European Americans, attending to salient properties of individual objects and events, may analytically segment the information into a greater number of units.

This is indeed what we found. In one study, Asian and European American college students were presented with a narrative text and were asked to segment the text into discrete events by indicating wherever, in their judgment, one meaningful event ended and another event began. As expected, Asians parsed the text into a smaller number of units than did European Americans. Furthermore, the cultural difference in event segmentation had direct consequences for memory, whereby at an immediate memory test following the reading, Asians recalled fewer event episodes from the text than did European Americans. These findings are significant because they suggest that event segmentation is not a mere product of neural reactions to the perceptual environment but is shaped by cultural experiences deeply embedded in the environment.

**Assumption 5. Cultural Psychological Research Only Confirms the Generalizability of Theories**

One of the major contributions of cultural psychological science is to allow researchers to test their theories and hypotheses outside of their usual pool of participants — namely, those from WEIRD (Western, Educated, Industrialized, Rich, Democratic) societies. Needless to say, a participant pool that represents 16% of the world's population and yet constitutes 96% of the samples in psychological research can hardly yield data and theories about human behavior without further verification. Thus, when developing and testing theories, researchers should consider including multiple cultural groups in their studies to examine the expected mechanism within each group and independent of culture. Yet there is more to it.

Developmental research has consistently shown that middle-class Western children with higher levels of emotion knowledge are more socially competent and exhibit lower levels of internalizing problems. For people from interdependently oriented societies, however, norms, roles, and obligations are often more important determinants of behavior than one's psychological states and emotions. In fact, advanced emotion knowledge in this cultural context may suggest an excessive focus on inner psychological states, which makes one at odds with cultural norms and expectations and may further result in social adjustment problems.

We demonstrated this in two longitudinal studies of European American and Chinese immigrant children in the United States. In one study, we assessed children's emotion knowledge at 3.5 years of age, using a task to elicit their understanding of situational antecedents of discrete emotions. Children's mothers reported on the children's internalizing problems (including anxiety, depression, and somatization) using the Behavior Assessment System for Children when their children were 7 years of age. After taking into account all group and individual variables (e.g., gender, verbal skills), we found that European American children who possessed advanced emotion knowledge at the preschool age tend to have fewer internalizing problems 3 years later. However, advanced emotion knowledge at preschool age was associated with increased internalizing problems later for Chinese immigrant children.

This suggests that emotional intelligence is construed differently and therefore serves varied functions in different cultures. Cultural psychology research plays a critical role in not only the confirmation but also — equally if not more importantly — the modification and enrichment of existing theories.

In an even more exciting situation, cultural psychology allows us to uncover mechanisms that are unique to non-Western populations — mechanisms that would be difficult, if not impossible, to detect in research with WEIRD samples. For example, studies involving middle-class Western families reveal that children's references to mental states, through discussions with parents and their own independent narratives, demonstrate an advanced theory of mind. Yet we have observed in our own research samples that Chinese and Chinese American parents and children do not frequently talk about mental states and instead talk more about other people's behaviors, actions, and roles. Given the importance of significant others and social relations in defining personhood in Chinese culture, would such talk about others — not necessarily regarding their mental states but simply referring to them — constitute a unique pathway for Chinese children's development of theory of mind? If so, this practice would seem to be an adaptive strategy that facilitates children's sociocognitive skills on the one hand and conforms to cultural expectations for reticence about subjective states on the other.

I was part of a research team that set out to test this hypothesis. In one experiment, we used a training paradigm directly to examine whether attending to others facilitates the development of theory of mind in Chinese children. Across four sessions within a 2-week period, researchers read preschool children a story and then asked them questions about it. Children in the experimental group were asked questions that directed their attention to the characters and their actions. Children in the control group were asked about the physical features of the story, such as the setting and the colors of the objects in that setting. Children's theory of mind was tested before and after the sessions with a battery of false-belief and deception tasks. We found that after merely 2 weeks' training, children in the experimental group performed substantially better in the posttest than in the pretest, whereas children in the control group showed no improvement in their theory-of-mind performance.
Training Chinese children to attend to story characters’ roles and behaviors thus facilitated the children’s theory of mind. This training procedure closely resembles the children’s everyday experience in a cultural context that emphasizes attending to others while devaluing explicit talk about inner thoughts and desires.

Had we mindlessly committed ourselves to the common wisdom that talking about the mind facilitates the understanding of mind; had we not wondered how Chinese children develop theory of mind given their limited exposure to explicit discussion about internal states; had we not considered the cultural conditions that shape the form, content, and function of communication; and had we not worked with Chinese children and families in the first place, we would not have found that talking about others constitutes a mechanism for the development of theory of mind.

Integrating Cultural Psychology in Research
In many ways, cultural psychology functions as a mirror that compels psychologists to reflect on their work and critically evaluate their theories and findings, to go beyond the surface and convenience to question what truly matters, and to embrace the complexity of human experiences with open minds and open hearts.

Yet simply acknowledging the importance of culture and cultural psychology is not enough; neither is it enough to simply acknowledge the limitations of one’s findings due to a focus on WEIRD samples. In our increasingly multicultural world, it is a pressing, necessary, and pragmatic task for us all actively to incorporate cultural psychology into our research programs.

When we set aside any presumptions, we can better see that a cultural psychological perspective helps us recognize, reduce, and eliminate biases, uncover new mechanisms and develop new theories, and understand human cognition and behavior as a constructive process that takes place in the interaction between a person and her or his environment. And when we set aside any presumptions, we can strategically evaluate and plan the integration of cultural factors into our research programs. We all should and can be cultural scientists.

For a full list of references, please see www.psychologicalscience.org/r/culture.

How to Be a Cultural Psychological Scientist

Keep an open mind. No matter whether you are studying basic neural–cognitive processes or complex social behaviors, stay open to the idea that these processes and behaviors may be subject to cultural influences.

Do your homework. Familiarize yourselves with existing cultural theories and empirical data relevant to the psychological process or construct you are exploring.

Embrace your multicultural samples. Multicultural, multiethnic samples have become increasingly common in your typical Psych 101 participant pools. Welcome them with open arms. Encourage and actively recruit participants from non-Western cultures in your research and ensure sufficient sample sizes.

Take culture into account. Systematically collect participants’ demographic information, including their cultural and ethnic background, gender, socioeconomic status, religion, geographical region, and other information pertinent to your research questions.

Appreciate “incidental” findings. Remain sensitive and attuned to group variations that may unexpectedly emerge in multicultural samples. Do not discard them but stay intellectually curious. Follow up on the earlier observations with high-powered studies.

Conduct hypothesis-based research. Develop hypothesis-based research to systematically investigate, confirm, and further explain the observed group variations.

Do not settle. Do not stop at just finding differences between cultural groups. If you suspect that certain cultural variables may play a role, find or develop appropriate measures for these variables and include them in the research design.

Consider Nature x Nurture interaction. Reflect on cultural differences and similarities in earlier observations. Examine the interaction between culturally variant and invariant factors in shaping human cognition and behavior.

Be a cultural methodologist. Take advantage of the unique methodological tools of cultural psychology (e.g., situation sampling, cultural priming). Examine the psychological construct of your interest at both group and individual levels and understand the dynamic relations across different levels of analysis.

Study culture within the person. Understand culture as not only shared norms, values, and practices within a group, but also as internalized norms, values, and practices within an individual. Measure individuals’ cultural attitudes and identification and test the effects on psychological processes and functions.

Build theories. Test your theories in diverse cultural groups. Continue your pursuit even when the generalizability is not confirmed so as to enrich your research programs and guide them in new directions.

-Q. Wang
Videos Share the Psychological Study of Language

By Conor T. McLennan and Sara Incera

With support from the APS Fund for Teaching and Public Understanding of Psychological Science, we developed the Psychology of Language Video Series, which is freely accessible through the Cleveland State University (CSU) Department of Psychology YouTube channel. The goal of this project was to make our science widely accessible by using a series of engaging videos featuring guest presentations from experts across the field. Two major advantages of the format are that the videos are easily viewed across various electronic devices and are easily shared by posting links to the series on websites and on various social media outlets.

The accessibility of the videos in this series creates an opportunity to share important psychological science — in this case related to the psychology of language — with the public. We encourage instructors to consider incorporating the series into their courses. For example, an instructor can show a video in class (or assign it for viewing at home) and follow up by assigning journal articles or book chapters by the speaker or on that topic. The videos also can serve as a bridge between introductory material in a textbook and more complicated material in peer-reviewed journal articles, allowing students to connect with the material in new and complex ways. The video series can be used as a teaching resource in many psychological science courses (e.g., Introduction to Psychology, Psychology of Language, Cognitive Psychology) and in related disciplines (e.g., linguistics, philosophy). Indeed, one of the many benefits of producing such a video series includes the opportunity to stimulate new collaborations, including new interdisciplinary research programs.

There are many benefits of these videos. Information is delivered in an engaging and personal way in order to effectively capture attention. In her video, APS Fellow Fernanda Ferreira says, “It is always exciting to talk to people about what my main passion has been in science, in research, and in my intellectual life, which of course is the study of language.”

In allowing researchers to talk about their findings and personal experiences, our series goes behind the scenes and captures real-life research. This is an excerpt from APS Fellow David B. Pisoni’s video:

“I have been going up to the school of medicine in Indianapolis each week for the last 24 years. I drive from my home in Bloomington the distance of 60 miles each way. I go up every Wednesday to study a very unique clinical population: profoundly deaf children.”

Anyone can read about the psychology of language, but with this video series we offer students — and the general public — the opportunity to hear the researchers’ perspective, as opposed to simply reading the “final” and neat product presented in textbooks and (perhaps to a lesser extent) journal articles.

There were many productive researchers — and many interesting and important research topics — that we wanted to include in the series, but we could only select a few. (The 10 speakers in the series, in addition to Ferreira and Pisoni, are APS...
President Susan Goldin-Meadow, APS Fellows Ellen Bialystok and David Matsumoto, and Timothy B. Jay, Victor S. Ferreira, Michael S. Vitevitch, Jennifer Pardo, and Phillip Hamrick.) Once a speaker agreed to participate in the video series, we scheduled a video conferencing call. Because many guest presenters lived in locations that would make visiting Cleveland cost prohibitive — and would require a much greater time commitment — the Center for Instructional Technology and Distance Learning at CSU streamed the presentations to CSU attendees. The Center also recorded the talks as they were streaming. Finally, we edited the videos, which proved to be a fun — albeit time consuming — part of the project. During this process, we selected the best sections for each speaker and included some slides (e.g., definitions, titles, questions) to make it easier for the viewer to digest the information.

We hope these 10 talks serve as the starting point for what will become the place researchers, instructors, students, and the general public use as a reference point to access free, brief, and interesting videos on the psychology of language. Researchers, including graduate students, who have published work related to the psychology of language are invited to email us their short videos so we can continue to update the series with the latest research in the field. We request that videos be under 15 minutes, free of jargon, and easy to understand. In order to encourage participation, we have a small reward for the first three researchers (including graduate students) who take the time and effort to create a video about the psychology of language and email it to us (c.mclennan@csuohio.edu). We hope you enjoy the series, and we look forward to receiving your video in the near future.

To view the video series, please visit https://www.csuohio.edu/sciences/language-research-lab/psychology-language-video-series.

Acknowledgements: This project was a team effort. We appreciate the work that Elizabeth Antol, Mark Hackett, Christopher Rennison (at CSU) and the technical teams (at the speakers' institutions) put into ensuring the project was a success. We also thank all of our speakers, without whom we could not have produced such an engaging series. Finally, we greatly appreciate the APS Fund for Teaching and Public Understanding of Psychological Science for funding the project.
Teaching Current Directions in Psychological Science

Edited by C. Nathan DeWall and David G. Myers

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

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

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

When Anxiety Doesn’t Add Up: Understanding and Preventing Math Anxiety

By C. Nathan DeWall


Snakes, spiders, and mathematics may seem worlds apart, yet they all can invoke apprehension and fear. The world does not need more snake handlers or spider trappers. But we do need more people who can perform basic and advanced math. What stands between the supply of math-competent people and the global demand for their services? The answer, according to Alana Foley, Julianne Herts, Francesca Borgonovi, Sonia Guerriero, and APS Fellows Susan C. Levine and Sian Beilock (2016), is math anxiety. Math anxiety refers to people’s apprehension and fear when they anticipate or perform math tasks (Richardson & Suinn, 1972). It’s no surprise that math anxiety predicts poor math performance, greater activation in brain regions related to fear, and avoidance of math-related professions (Beilock & Maloney, 2015). The more startling finding is that math anxiety often gets transmitted from one’s parents, teachers, and culture. Students often are taught to question their math ability and whether they can meet their culture’s expectations about how well they should perform. The result is a growing population of students who associate math with anxiety. Approximately 1 in 4 university students report math anxiety (Beilock & Willingham, 2014). That rate jumps to 80% among community college students. But there is good news: Just as people can learn to fear math, people also can extinguish their math anxiety. They can perceive their physiological arousal as something that can benefit their performance (Jamieson, Mendes, Blackstock, & Schmader, 2010). They can write about their thoughts and feelings before doing a math test (Park, Ramirez, & Beilock, 2014). And, especially when they’re young, they can prioritize having positive interactions with their parents that relate to math (Berkowitz et al., 2015). All of these options are effective ways to reduce math anxiety and improve math performance.

To bring this cutting-edge science to the classroom, instructors can have students complete two activities. The first activity teaches students about the causes and consequences of math anxiety; the second activity shows students how to reduce math anxiety. The activities should take approximately 5 and 7 minutes respectively.

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Activity No. 1: Where does math anxiety come from, and why does it matter?

It helps to understand from where math anxiety might originate. Ask students to think of a time in their lives when they experienced fear and apprehension related to math. The situation could involve something as trivial as making sure they had the correct change for a gas-station purchase or as crucial as completing the quantitative portion of the SAT. If students haven’t experienced math anxiety, ask them to write about a time when a close friend or relative did.

Next, have students form pairs and discuss their responses to the following questions:

- To what extent do your parents experience math anxiety? How much time did your parents spend with you as you learned math?
- When you learned basic and advanced math, did your teachers show signs of math anxiety? If so, how much?
- Have you felt social pressure to perform well or poorly on math tests? How have these pressures to succeed or to avoid embarrassment by performing well made you feel?
- Do you feel that stereotypes about members of your group (e.g., gender, race, ethnicity, country of origin) have affected your math anxiety?

Instructors then can discuss how students’ responses to these questions may help explain their math anxiety. Having math-anxious parents or teachers increases one’s likelihood of experiencing math anxiety. Ditto for members of cultural, ethnic, or racial groups who feel that others expect them to excel or fail at mathematics. Thus, students can see how they may have learned to experience math anxiety — and how they can learn to combat that anxiety.

Activity No. 2: Math is your friend

Knowing the causes and consequences of math anxiety is not enough. How can you reduce math anxiety? Make it a friendly challenge rather than a menacing threat. Framing tasks as challenges versus threats improves healthy physiological responses and performance (Blascovich & Mendes, 2010).

Instructors first need to divide their class randomly into two groups. Next, ask one group of students to read the following prompt on a PowerPoint slide:

Rethinking Arousal Condition

In this activity, you’re going to complete a math exercise. Math can cause people to feel anxiety. Your heart might race, your palms might sweat, and your breathing might speed up. This sort of arousal can help you. Much research shows a relationship between physiological arousal and better performance.

Spend the next 2 minutes writing about any thoughts and feelings you have as you prepare for the math activity.

Ask the other group of students to read the following prompt on a PowerPoint slide:

Sit Quietly Condition

In this activity, you’re going to complete a math exercise. Please sit quietly for a couple of minutes as you prepare for the math activity.

Finally, show all students the following PowerPoint slide:

Math Activity

This math activity will test your ability to perform mental calculations quickly. Your job is to start at the number 913 and subtract the number 6 repeatedly. You have 3 minutes to complete as many calculations as possible.

Ready? Go!

Once students complete the exercise, ask them how much the activity caused them to experience fear and apprehension about math (1 = not at all to 7 = extremely). How much did the preactivity prompt influence their math anxiety? How many math calculations did they complete during the 3-minute math activity? Instructors can discuss how the instructions included in the Rethinking Arousal Condition have improved performance on tests that normally induce anxiety (Jamieson et al., 2010; Park et al., 2014).

Math anxiety hinders otherwise competent people from pursuing careers that involve both basic and advanced math. Although math anxiety resides within an individual, it often is transmitted through one’s parents, teachers, and culture. We can stem the tide of math anxiety by encouraging people to express their thoughts and emotions about math, to perceive math as a challenge to master rather than a threat to overcome, and to believe that they have what it takes to master most mathematical activities they will encounter in their everyday lives.

The article “The Math Anxiety-Performance Link: A Global Phenomenon” will be available in the February 2017 issue of Current Directions in Psychological Science.
ShouId You Trust YoUr Unconscious When Judging Lying? Probably Not!

By Gil Einstein and Cindi May


How good are we at detecting a lie? The department store salesperson tells you that your outfit looks stunning. An applicant presents a background that fits perfectly with the advertised criteria. A friend tells you that she would love to go on a date if she did not have a prior engagement. A defendant swears that he wasn’t anywhere near the scene of the crime.

Are these people lying? Research suggests that we are not particularly good lie detectors: After watching video tapes of people who are lying or telling the truth, participants are barely above chance (less than 55%) at identifying the liars (Bond & DePaulo, 2008) — at least when making this decision consciously.

There has been great interest in recent years in the power of unconscious processing. Although this topic is highly controversial (see Newell, 2015; Nieuwenstein et al., 2015), many have suggested that the unconscious can perform complex cognitive processing — handling large amounts of information without effort — and can make better decisions than the more limited conscious mind. For example, a number of studies suggest that whether you are selecting art to hang on a wall or making a sports bet, people who go with their gut rather than executing careful analysis are more satisfied with their choices. Indeed, a theme in Malcolm Gladwell's (2007) popular book titled Blink: The Power of Thinking Without Thinking is that quick, snap judgments are often more accurate than slow, deliberate, and methodical reasoning.

Consistent with this thinking, many researchers argue that our unconscious, gut feelings are more adept than our conscious processes at lie detection. One explanation is that our conscious decision processes are subject to biases (such as a truth bias and a desire to trust others) and that our unconscious processes, unencumbered by these predispositions, are better equipped to detect lying (ten Brinke, Stimson, & Carney, 2014). If so, as Volker H. Franz and Ulrike von Luxburg (2015) note, perhaps we should start instructing jurors to forego conscious and careful discussions and instead rely on sheer intuition.

In their well-balanced Current Directions in Psychological Science article, Chris N. H. Street and Miguel A. Vadillo conclude that the current evidence for potent unconscious lie-detection processes is not convincing. They argue that existing research (1) fails to eliminate the influences of conscious processes, (2) includes mixed findings and failures to replicate key results (Moi & Shanks, 2015), and (3) sometimes uses questionable comparison conditions (see the arguments of Franz & von Luxburg, 2015).

Much of the support for the power of the unconscious comes from comparing lie-detection accuracy using direct and indirect methods. In the direct method, participants are shown videos and told that the speakers may be lying and then asked to make a conscious judgment. In the indirect method, participants are not told that the speaker may be lying but instead are asked to judge a characteristic of the speaker, such as whether he/she is “tense” or “thinking hard.” The researcher then codes the “thinking hard” or “tense” responses as “lying” judgments (and “not thinking hard” and “not tense” responses as “truth” judgments). Early research found that indirect judgments were more accurate than conscious direct judgments (DePaulo & Morris, 2004). The assumption is that when we are distracted by an orienting activity, a more skilled unconscious system takes over.

To sensitize students to the indirect method and some of its limitations, you could present them with several videos from the Bloomsbury Deception Set (you can request these videos from Street’s laboratory website at https://conflictlab.org/stimuli). This set of videos contains 18 speakers who were each tape describing two stories about a holiday vacation — telling the truth in one and lying in another. You could first test the indirect method by presenting several videos and asking students to judge whether the speaker is “thinking hard” or “not thinking hard.” You could then try the direct method by presenting several other videos and asking students to assess whether the speaker is telling the truth or lying. After converting the indirect judgments to lie/truth scores, you can assess whether students were more accurate with the indirect method.

Regardless of the outcome, this demonstration can serve as a basis for discussing whether the indirect method necessarily assesses unconscious lie-detection processes. Street and Vadillo (2016) reasonably propose that it does not. First, they argue that indirect method studies often rely on judgments — such as whether or not the speaker is “thinking hard” — that are diagnostic of lying and that those studies tend to find high
lie-detection scores. Interestingly, a recent meta-analysis found that the indirect method often leads to lower lie-detection scores than the direct method (about 80% of the time; Bond, Levine, & Hartwig, 2014), and this likely happens when the to-be-judged characteristics are not reliably diagnostic of lying. Thus, the impressive results from the indirect method, when they occur, appear to be the product of focusing conscious attention on diagnostic characteristics of speakers (Street & Richardson, 2015) rather than relying on unconscious processes. Second, the researchers point out that the judgment that is used in a particular study is selected by the experimenter and not by an all-knowing unconscious.

As a general point, Street and Vadillo (2016) remind us of the law of parsimony, and that it is probably unwise to invoke mysterious unconscious processes when a simpler explanation (conscious processing) exists. ○

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The field of psychological science is continually changing. These changes are spurred by many factors, from the development of new methodological approaches to shifts in the sociopolitical climate. For students, this ever-morphing environment can feel exciting, as though we are at the cutting edge of our field; yet it also can feel daunting, as if there is no end to the amount of training we need before we can jump-start our careers. The optimism that initially might have led us to pursue graduate degrees can slowly wear down after spending so much time plugging away at research projects; putting in many hours studying for classes that we often are told do not actually matter; and applying for scholarships, grants, awards, teaching assistantships, and practicum or internship placements year after year. Furthermore, with a seemingly dwindling number of tenure-track academic positions available, feelings of pessimism can easily abound. What can programs or students do to get out of this rut?

The purpose of this article is to envision ways that programs and students can improve graduate training and empower other students. The aim is not to propose a complete restructuring of graduate school, but rather to provide some realistic and flexible strategies for improving the experience.

Improving Communication Between Programs and Students

Free-flowing communication between institutions and students is at the heart of a healthy relationship between the two. Communicating clear expectations and feedback to students allows them to set goals, measure their progress, and make adjustments as needed. Information often passes from institution to student through formal evaluations or meetings with one’s advisor, but there are other avenues for improving the flow of information. Programs can provide data to current students about norms for students in the program: What jobs are recent alumni getting? How many publications and/or conference presentations do students generally have by the time they graduate? For clinical students, how many hours of hands-on experience do students have on average when they apply for internships? Transparency about the expectations and norms for students as they progress through graduate school helps students set realistic and productive goals.

Equally important is the flow of information from student to program. Creating a system through which students can provide feedback to the program serves both parties well. It empowers students to get their needs met, and it helps programs prevent problems from occurring later. One helpful way to facilitate this process is to implement an annual student survey to evaluate students’ career goals, satisfaction with different areas of the program, departmental climate, and areas that need improvement. Faculty then can use this feedback to make adjustments and monitor the needs of students. In addition, programs can invite students to serve on various committees. At my home institution, the University of California, Los Angeles, a student representative from each cohort attends a monthly area meeting and is invited to voice concerns and provide feedback.

Reducing Student Debt

Funding and debt are major sources of concern for many graduate students. The National Science Foundation’s Survey of Earned Doctorates (2012) estimated that approximately one third of doctoral students in the social sciences take out loans to support them during their graduate studies. While eliminating student debt completely requires systemic changes that are beyond the scope of this article, there are certainly ways that programs and students can start addressing this issue now. First, programs can support graduate student associations and/or unions that advocate for students. Second, programs can admit fewer students. Though this is a controversial topic, it is one that deserves attention. If programs only have the ability to fund a certain number of students, requiring others to take out loans or work while studying, this creates an imbalance among students in terms of financial stress and time available to dedicate to research. Third, programs can find creative ways to help fund students. Perhaps there are available positions in other departments that students can take or paid clinical positions for students who need to gain clinical hours. Finally, a major step that students themselves can take is to choose their programs wisely. Does the program provide funding? Will you be guaranteed a teaching assistant position that covers tuition and provides a stipend? What percentage of students in the program obtain...
outside funding? If you do not receive any funding, how large of a loan will you need to take out, and how long will it take you to pay it off? Is there another degree (Master’s vs. PhD) that would help you reach your goals but would do so without forcing you to incur a large amount of debt?

**Supporting Individualized Career Paths**

Programs often are put in the difficult position of needing to support students’ grand ambitions while also encouraging realistic goals. For example, though many students enter PhD programs with ambitions of academic careers, the number of graduates from doctoral programs greatly exceeds the number of tenure-track faculty positions that are available each year (Schillebeeckx, Maricque, & Lewis, 2013). Furthermore, career goals are likely to change over the 5+ years that a person is in graduate school. Integrating a dialogue about changes in career goals throughout graduate school and normalizing this for students will help students find the path that is right for them. One way to facilitate this process is to integrate professional development into the grad school curriculum. For example, in response to student feedback at my home institution, our program invited local alumni and others working in various fields within psychology to participate in career panels that students could attend. Programs also can facilitate the creation of alumni networks that would allow current students to contact previous graduates who have gone on to interesting and fulfilling careers. In addition, students can help each other by fostering peer support systems such as the PhD Career Ladder Program (http://phdladder.wixsite.com/phdladder), a student-developed program designed to help students identify and prepare for their career goals. APS also has helpful resources for students looking for additional guidance outside of their home programs (see http://www.psychologicalscience.org/members/mentorship-opportunities).

**Maintaining Flexibility**

Adapting to change is a crucial element of success for both individuals and programs. The ability to be flexible is one major advantage that we, as students, have over later career psychological scientists. For example, students can take advantage of graduate student resources to learn how to utilize the most state-of-the-art quantitative methods. Additionally, since students are expected to be in the learning stage of their careers, faculty are likely more open to acting as consultants and advisors to students than to nonstudents. However, in order to foster student flexibility, programs also must adapt to change by keeping up with the changing scientific, political, and funding climate and by encouraging students to respond to change as well. One way programs can do this is by offering training in areas that have large potential for future job growth. For example, programs can offer more courses and training in geropsychology and health psychology, two areas predicted to have significant growth; provide opportunities for students to work in integrated health care systems during graduate school; and help students connect with businesses or government organizations to solve real-world problems as part of courses or research projects. Finding and creating ways to improve communication, reduce students’ financial burdens, support diverse career paths, and encourage flexibility will benefit both institutions and students. Just as the field of psychology is constantly evolving, so too must the institutions that foster its study.

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IILLINOIS

University of Chicago    Psychology   Assistant – Full Professor
The University of Chicago, Department of Psychology, is seeking applications for a faculty appointment (Assistant, Associate, or Full Professor) in Social Psychology. We particularly encourage applications from those who use a neuroscientific approach to advance the field of social psychology. Interested candidates must apply online at the University of Chicago's Academic Career Opportunities website at http://tinyurl.com/johwpmg. Applications must include 1) a cover letter; 2) current curriculum vitae; 3) a research statement; 4) a teaching statement and 5) three representative publications. Ph.D. must be in hand by start of appointment as Assistant Professor. Applicants for appointment at the assistant professor level must arrange for submission of four letters of reference to the aforementioned website. Applicants qualified for appointment at the senior level should include contact information for four references in their cover letter. The Search Committee will begin reviewing applications on November 20, 2016 and will continue to consider new applications until the position is filled or the search is closed. Early application is encouraged. The University of Chicago is an Affirmative Action/Equal Opportunity/Disabled/Veterans Employer and does not discriminate on the basis of race, color, religion, sex, sexual orientation, gender identity, national or ethnic origin, age, status as an individual with a disability, protected veteran status, genetic information, or other protected classes under the law. For additional information please see the University’s Notice of Nondiscrimination at http://www.uchicago.edu/about/non_discrimination_statement/. Job seekers in need of a reasonable accommodation to complete the application process should call 773-702-5671 or email ACOppAdministrator@uchicago.edu with their request.

INDIANA

Indiana University               Psychological & Brain Sciences                                         Visiting Asst. Professor – Three Positions
The Department of Psychological and Brain Sciences is seeking to fill THREE positions for a visiting assistant professor to teach undergraduate courses in the areas of Introductory Cognitive, Social, or Neuroscience. The ideal candidate will be an experienced instructor at the college level with an interest in adding value to the undergraduate program. This will be a 1 year appointment, renewable for one additional year. The teaching load is five courses a year. Applicants should have an advanced degree (a PhD in Psychology or related field is preferred), and documented teaching experience. Applicants should submit a letter of application that includes a statement of teaching philosophy and experience, evidence of teaching effectiveness, a curriculum vita, and have three letters of recommendation. Interested candidates should review the application requirements and submit their application at https://indiana.peopleadmin.com/postings/3040. Questions regarding the position or application process can be directed to: Dr. Tom Busey, Associate Chair, ATTN: Instructor Search, Department of Psychological and Brain Sciences, 1101 E. 10th Street, Bloomington, IN 47405-7007 or busey@indiana.edu. Applications are encouraged by January 31, 2017. Information about the department and the university is available at http://www.psych.indiana.edu. Indiana University is an equal employment and affirmative action employer and a provider of ADA services. All qualified applicants will receive consideration for employment without regard to age, ethnicity, color, race, religion, sex, sexual orientation or identity, national origin, national origin, disability status or protected veteran status.
### Harvard University

The Department of Psychology seeks to appoint a tenured professor whose interdisciplinary research and teaching explores multifaceted factors that guide and affect human mind and behavior. The successful appointee will be expected to strengthen links between the Department of Psychology and the broader scholarly community. The search is open to individuals trained in neighboring fields. The appointment is expected to begin on July 1, 2018. The professor will teach and advise at the undergraduate and graduate levels. Candidates are required to have a doctorate. Demonstrated excellence in teaching and research is desired. Candidates should also evince intellectual leadership and impact on the field and potential for significant contributions to the Department, University, and wider scholarly community. Candidates should submit a cover letter, curriculum vitae, research and teaching statements to http://academicpositions.harvard.edu/postings/6093. Questions regarding this position can be addressed to randy_buckner@harvard.edu. Applications will be considered starting on December 1, 2016. We are an equal opportunity employer and all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, disability status, protected veteran status, or any other characteristic protected by law.

### Wayne State University

**Industrial/Organizational Psychology, Wayne State University.** The Industrial/Organizational Psychology program in the Department of Psychology invites applications for a tenure-track position beginning August, 2016. Rank is open, but Ph.D. in I/O Psychology or closely related field by August, 2016, is required. Preference will be given to applicants whose primary background and interests are in personnel psychology; however, individuals with specialization in any area of Industrial/Organizational Psychology will be considered. Individuals with a strong quantitative background are particularly encouraged to apply. Successful applicants are expected to maintain or establish an externally funded research program. Normal teaching load is two courses per semester and involves both undergraduate and graduate instruction. Review of applications will begin immediately and will continue until the position is filled. Applicants should submit a CV, cover letter, key reprints/preprints, statements of research and teaching interests, and three letters of references to the job posting on the Wayne State University Online Hiring System. To apply, go to jobs.wayne.edu and search for posting number 042323. Letters of reference may also be sent to es9929@wayne.edu. Questions concerning this position may be directed to Dr. Marcus Dickson, Chair of the Search Committee, at (313) 577-0753 or marcus.dickson@wayne.edu. Wayne State University is an Affirmative Action/Equal Access/Equal Opportunity Employer that encourages women and minority candidates to apply. Successful applicants are expected to maintain or establish an externally funded research program. Normal teaching load is two courses per semester and involves both undergraduate and graduate instruction. Review of applications will begin immediately and will continue until the position is filled. Applicants should submit a cover letter, curriculum vitae, research and teaching statements to http://academicpositions.harvard.edu/postings/6093. Questions regarding this position can be addressed to randy_buckner@harvard.edu. Applications will be considered starting on December 1, 2016. We are an equal opportunity employer and all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, disability status, protected veteran status, or any other characteristic protected by law.

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### ICPS Pre-Conference Teaching Institute | 23 March 2017

#### Opening Plenary

**Culture: What It Is, Why It Matters, and How to Teach It**

Hazel R. Markus, Department of Psychology, Stanford University, USA

#### Concurrent Sessions

**Essential Technology for Teaching Psychological Science**

Susan M. Frantz, Department of Psychology, Highline College, USA

**Learning and Teaching of Psychology in Europe: Challenges at the Macro and Micro Level**

Stephan Dutke, Department of Psychology, Universität Münster, Germany

**What’s New in Social Cognition? An Update for Teachers From Joint Action Research**

Natalie Sebanz, Department of Cognitive Science, Central European University, Hungary

#### ‘Learning Works Best if …!’ How Do University Lecturers and Students Think About Teaching and Learning?

Regina Jucks, Department of Psychology, Universität Münster, Germany

**What Should Developmental Psychology Students Be Learning About At-Risk Children? An Update on Research and Intervention Programs**

Silvia H. Koller, Department of Psychology, Universidade Federal do Rio Grande do Sul, Brazil

**Rapid Growth and Internationalization of Psychological Science Programs in the Developing World**

Nebi Sümer, Department of Psychology, Orta Dogu Teknik Üniversitesi, Turkey

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**www.icps2017.org**
## MEETINGS

### 2nd International Convention of Psychological Science
23–25 March 2017  
Vienna, Austria  
[www.icps2017.org](http://www.icps2017.org)

### 29th APS Annual Convention
May 25–28, 2017  
Boston, Massachusetts, USA  
[www.psychologicalscience.org/convention](http://www.psychologicalscience.org/convention)

### 2017 Prague Summer Schools
July 1–8, 2017  
Prague, Czech Republic  
[praguesummerschools.org/](http://praguesummerschools.org/)

### RAND Summer Institute Conferences on Aging
July 10–13, 2017  
Santa Monica, California, USA  
[www.rand.org/labor/aging/rsi.html](http://www.rand.org/labor/aging/rsi.html)

## GRANTS

### AAAS Minority Science Writers Internship
The American Association for the Advancement of Science (AAAS) Pitts Family Foundation Minority Science Writers Internship Program is now accepting applications from undergraduates who are interested in journalism as a career and who want to learn about science writing.

The internship takes place each summer at the DC headquarters of the AAAS’s Science magazine. Interns spend ten weeks at Science under the guidance of award-winning reporters and editors practicing what science writers do for a living. They have a chance to meet leading scientists, attend conferences and hearings, and cover breaking news. Interns are expected to contribute to all facets of the news operation, including writing bylined articles for the print magazine and online news service, engaging in social media, and contributing to other news products. The application deadline is February 1st, 2017. For more information, visit [www.aaas.org/mswi/apply](http://www.aaas.org/mswi/apply).

### Call for Papers for Special Issue With the Topic “Addressing Gender Inequality”
Group Processes & Intergroup Relations has issued a call for papers for a special issue examining gender inequality. The aim of this special issue is to provide an overview of the many ways in which gender inequality can, and has been, addressed and the consequences — both intended and unintended — that different approaches, interventions, and policies may have. The journal encourages submissions that examine approaches combatting a range of gender inequalities including workplace, social, political, and economic inequalities as well as inequality in the family and other private spheres. They also encourage submissions of work looking at intersectional issues. The submission deadline is April 1, 2017. For more information, please visit [http://gpi.sagepub.com/site/CFPs/SI_Gender_Inequality.pdf](http://gpi.sagepub.com/site/CFPs/SI_Gender_Inequality.pdf). Please direct any inquiries to the guest editors Michelle Ryan at M.Ryan@exeter.ac.uk and Thekla Morgenroth at T.Morgenroth@exeter.ac.uk.

### Grants Announced for Child Care, Head Start, Family Strengthening, and Behavioral Intervention
The Administration for Children and Families (ACF) is excited to announce that the Office of Planning, Research, and Evaluation (OPRE) has forecasted their intent to fund Child Care, Head Start, Family Strengthening, and Behavioral Interventions graduate student dissertation grants in 2017. Please visit [grants.gov](http://grants.gov) for more information.
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