Observer

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The Environment and Us

The psychological science of confronting climate change and cultivating sustainable societies

Observer

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ON THE COVER: Climate change and environmental degradation continue to confront humanity with new challenges to health and well-being—from increased flooding, hurricanes, and drought to noise pollution and the "greenwashing" of toxic or wasteful products. But while human behavior is undoubtedly the cause of these problems, our potential to make new choices gives reason for hope. Cover art and other images throughout this issue from Getty Images.

Observer

IN FOCUS:
The Environment and Us

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From our homes and neighborhoods to the world beyond, the environment and human behavior are mutually and inextricably dependent. These five articles investigate.

> **"** Simply speaking, why target environmentalists to act environmentally when it's non-environmentalists who need the convincing? **"**
>
> —ALISTAIR RAYMOND BRYCE SOUTTER, "CULTIVATING CULTURES OF SUSTAINABILITY," PAGE 43

> "The key, I think, is to recognize and acknowledge the ultimate significance of the pursuit of dignity—a view of the self as a respectable, reputable, and honorable being. This pursuit must be recognized as a fundamental human right."
>
> —SHINOBU KITAYAMA, PRESIDENTIAL COLUMN, PAGE 6

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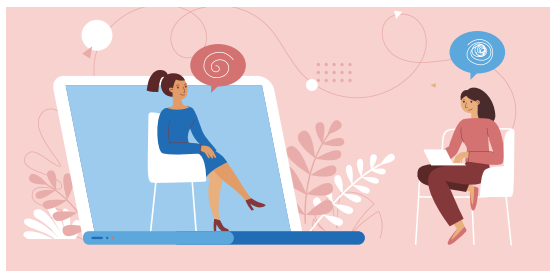
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Humans' impact on the environment is one of the most pressing social issues today, and it's time to include it in psychology courses, says APS Fellow Barbara Malt. Read at psychologicalscience.org/educating-sustainability.

Changing the Climate on Climate Change

A team of scientists highlights evidence-based insights for public policy and decision-making on climate change. Read at psychologicalscience.org/changing-the-climate.

The Social Dynamics of Environmentalism

Our willingness to engage in pro-environmental activities reflects how we relate with our political ecosystems and nature itself. Read at psychologicalscience.org/social-dynamics-environmentalism.

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The best way to encourage environmentally friendly behavior may be to focus on the changes that are already happening. Read at psychologicalscience.org/eco-norms.

THE SOCIETAL DIVIDE: WHAT CAN WE DO ABOUT IT?

By **Shinobu Kitayama**
APS President

I t has been my privilege to serve as the APS President this past year. I have appreciated the ample opportunity to reflect on our profession, the science, and ideas for practicing it and disseminating the knowledge it produces. I wrote about some of these ideas in my columns, covering topics including racism, the COVID-19 pandemic, diversity and inclusion, the scientific goals of APS, journal publishing, and the nature of scientific progress. But I have not done much on another pressing issue we face: the societal divide by social class. In what follows, I want to discuss the global context of this divide, articulate its consequences, and explore what we can do about it. To get a clear

idea about the role psychologists can play, we must start with where the problem belongs—namely, society.

Economic globalization

Economic disparity is increasing in the United States and elsewhere. Few people would disagree that it is one of major driving forces behind growing populism and radicalism on the right (and, sometimes, the left)—again, both in the United States and elsewhere (van den Bos, 2018). Specific factors may vary from one place to another. However, when we look closely at these factors, we realize that many of them are ultimately linked to something seemingly unrelated: economic globalization.

A few decades ago, when the tide began to shift toward globalization in world trade and business, many people welcomed the change. The globe was said to be flattening, which seemed more egalitarian and even democratic. Economic interdependence across the world was realized through various technological feats, including the Internet. And this interdependence was promoted as a much-needed antidote against nationalistic egos and greed. Some feared that international chains, such as McDonald's and Starbucks, could expel local cultures, including regional cuisine and traditional practices, but many expected the benefits of globalization to exceed its downsides. If you had this optimistic view of economic globalization, you failed to understand its full scope.

Everywhere on the globe, there has emerged a small group of educated, wealthy people who have benefited vastly from globalization. Let's call them elites. The elites have had easy access to the benefits of globalization. They can take advantage of global information networks to make new types of wealth through, say, international trade and global financial investment. They are not productive in the traditional sense of growing crops and crafting commodities. Rather, they access information and use it to create new social and personal capital and novel financial opportunities. People in this category are not limited to professionals in the financial sectors. Indeed, many psychological researchers fall into this category. Our profession is based primarily on information, rather than the production of tangible goods: We create and disseminate knowledge.

Meanwhile, many others have been left behind. Although the United States has benefited more from economic globalization than most countries, the benefits have largely flowed to the elite class. For the rest of the population, many jobs have disappeared, and the jobs available no longer provide a living wage. For example, line workers in automobile plants in Detroit have seen their jobs outsourced to places where labor is cheap and its conditions

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exploitative. Workers in the apparel industry have suffered the same fate. The decline of the working class in the United States has been exacerbated by the technological advances that have made globalization a reality, including automatization in all areas of production. Many traditional types of work, which produced something tangible, whether it be cars or clothes, are now automated, performed by robots, and regulated by computers. Increasingly fewer people are needed for production. Moreover, unlike in many European countries, no robust safety net is available in the United States for those who lose their jobs. The working class has thus been decimated.

To be left behind

The economic downturns that imperiled the White American working class have had a massive toll. For example, Case and Deaton (2020) have documented a precipitous drop in the longevity of non-Hispanic White Americans without college degrees over recent decades despite increases in longevity among other groups during the same period. Drug overdoses and suicides are likely the major culprits behind this tragic phenomenon.

Further, the economic downfall of the White American working class might have also motivated many to participate in populist movements and revolts against the elite class. Such revolts are evident in politics (as in Trumpism), business (as in protests against Wall Street), and science (as in the anti-vaccine movement during the current pandemic). Moreover, as

I see a moral crisis simmering everywhere.

many working-class people have continued to work hard and wait patiently for their American dreams to come true, they have perceived immigrants and racial and ethnic minorities as "cutting the line," so to speak, to move past them to achieve *their* dreams (Hochschild, 2016). They therefore see policies that seek to address past racial injustice (e.g., affirmative action policies) as favoring racial minorities at their expense (Lowery et al., 2006). As a consequence, they feel left behind completely—and unfairly. Metaphorically speaking, they have ended up feeling like "strangers in their own land"—to quote from the title of a recent book addressing this very issue (Hochschild, 2016).

It is easy to imagine how refreshing the populist arguments of many right-wing politicians, including Donald Trump, would sound to the ears of those who feel left behind by the shift of the times. Remember, these politicians have strongly denounced the elites in Washington and on Wall Street, even though they are arguably elites themselves. Many of the same politicians have also dehumanized immigrants and foreigners. It is easy, too, to imagine how this public discourse has precipitated violence against racial and ethnic minorities, including the deaths of countless Black and Brown people, such as George Floyd and Breonna Taylor, at the hands of White police officers, as well as the recent flood of anti-Asian violence.

Moral crisis

I see a moral crisis simmering everywhere. This crisis has deep roots in many contradictions in economic globalization. From the perspective of White working-class Americans, two contradictions would stand out. One is that you work hard and yet don't earn enough to make ends meet or, even worse, can't keep your job. Another is equally serious: While you are waiting for your turn to realize your dreams, you perceive that others, particularly minorities and immigrants, are moving quickly toward their dreams and leaving you behind. You surely did not do anything wrong, so you feel cheated. Moreover, the system that cheats you does not seem to acknowledge the moral values most important to you, such as discipline, reputation, hard work, and honor. That system seems like nothing more than a profit-making branch of the globalization agenda that ignores you.

I must note that this perception itself is unfair and deeply troubling from a different perspective—that of many racial and ethnic minorities and immigrants. Many of them have also been left behind by the forces of economic globalization. Indeed, the perception that minorities have gained economic ground is a misconception that has contributed to the maintenance of wealth disparity across racial lines in the United States (Kraus et al., 2019). Moreover, minority groups have long suffered from systemic racism in ways the White majority has never experienced.

Despite these caveats, however, it is still valuable to learn and see what's going on from the White American working-class perspective. You can then begin to understand an important aspect of the psychology behind ultra-right-wing movements. This perspective will also help explain why many rioters in the January 6 U.S. Capitol surge have not shown any remorse or contrition. They acted on the conviction that they had been morally violated, cheated, and left behind. To ➡

be clear, the riot was a serious crime. The rioters must be prosecuted. However, this prosecution would not address the deeper problem that precipitated the riot. The problem is a long time coming and now appears to be getting worse. Addressing the resulting discontent of those left behind will require something more fundamental.

In his song "Like a Rolling Stone," Bob Dylan captured this sense of alienation at its core. The 6-minute tune encapsulates betrayal, fear of being left behind, and anger toward those who treat you like "a complete unknown." Combine all this with the realization that there is no safety net to protect you. Dylan repeatedly asks, "How does it feel (to be like that)?" He wrote the song in the 1960s, during the early years of his extremely prolific career, well before the demise of the American working class, yet he crystalized the sense of alienation and despair that many White working-class Americans are now feeling. When you are betrayed by a trusted somebody, perhaps by society at large, you are a stranger in your own land. No dignity is left in you, which threatens the most basic aspects of what it means to be human.
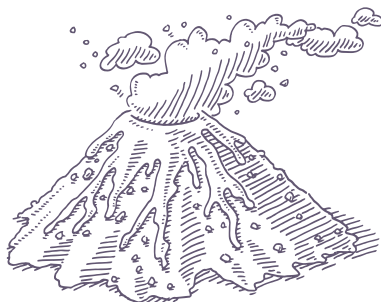
I must add that this moral crisis is not a uniquely American problem. This crisis is tied to economic globalization, and as such, it is global in nature. Think of the terrorist attacks in Paris and Amsterdam. Also, radicalization is on the rise in Asia, Latin America, and Africa—that is, everywhere. Kees van den Bos (2018), a prominent justice researcher in the Netherlands, has concluded that the moral crisis and the resulting radical movements so rampant in the world today are rooted in the perception that "we" are being unfairly treated.

The psychology of morality and alienation

What can we do to address this moral crisis that confronts humanity? At one level, more research is needed. Those left behind feel moral resentment, which comes with a deep sense of alienation by society. So, particularly relevant would be the intersection of these two research topics: morality and alienation.

First, there has been a recent, timely comeback of morality research. Many

readers must be aware of an early Kohlbergian tradition of conceptualizing the different stages of moral development. This work motivated subsequent cross-cultural work on morality (Shweder et al., 1997) and values (Schwartz, 1992). Now, many scholars are extending this literature with new experimental paradigms and novel methods in social cognition and neuroscience (e.g., Haidt et al., 1993; Greene et al., 2001). Paul Rozin must be noted in particular for his pioneering effort to clarify the emotional basis of morality (e.g., Rozin et al., 1997), which paved the way toward more recent examinations of embodied moral emotions (e.g., Lee & Schwarz, 2012). Altogether, this emerging literature promises to enrich our understanding of moral cognition.

Second, there is a growing body of work investigating loneliness (Cacioppo & Patrick, 2009; Ozawa-de Silva, in press). It is now very clear that loneliness is linked to a series of gene-level, transcriptional activities causing inflammation and immunosuppression (Cole et al., 2015). Loneliness comes from a perception that one has lost meaningful touch with others, which amounts to alienation. Thus, by combining morality research with the neurobiology of loneliness, a new research horizon may open up to illuminate the nature of alienation. There is much more to learn, but our science is moving forward.

Although the resulting scientific knowledge on alienation is indispensable, it is also clear that something more is needed. We must be able to present forceful visions about what to do with this thing called alienation and propose strategies to address the

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A new episode of *Under the Cortex*, the APS podcast, features Kees van den Bos of Utrecht University and his research on radicalization. Listen with this column on psychologicalscience. org/observer or through Podbean or Apple Podcasts.

> **Hard work is expected to lead to success, which translates into a sense of dignity. Dignity must be earned, but it must be made earnable to begin with.**

misery at the social structural or systemic level. In my December 2020 column, I pointed out that racism at its core is systemic and structural. This argument applies to the alienation of the American White working class as well. I hope this column can initiate a much-needed conversation about what to do to reform the societal system behind the current misery of people who have been left behind. Although everything is up for debate, I believe one broad avenue presents itself as particularly promising to examine, explore, and perhaps try.

The pursuit of dignity

The key, I think, is to recognize and acknowledge the ultimate significance of the pursuit of dignity—a view of the self as a respectable, reputable, and honorable being. This pursuit must be recognized as a fundamental human right. This right is not on the list that has undergirded modern democracy. It did not make the *Declaration of Independence* (which highlighted life, liberty, and the pursuit of happiness), for example. Only after World War II, when the United Nations was founded, in part, to prevent all future genocides, was this concept formally introduced (Hughes, 2011). But even though the pursuit of dignity has only recently come to the fore of collective consciousness, I would argue that it has long been taken for granted. This explains why it did not get into many foundational documents of modern democracy.

Before the postindustrial era, until just a few decades ago, dignity was tied closely to production—initially through hunting and gathering, and then through farming and herding. For much of our history, humans farmed crops, kept animals, crafted various goods, and sold them. These activities were indispensable, and as a consequence, they were also respectable, honorable, and reputable. Everyone depended on those products, which meant they depended on one another. More recently, acts of production have become increasingly disposable (because of automation) and replaceable (with robots). If dignity was inherent in humanity, as is often assumed, that was only because it was guaranteed by the mode of production. That may no longer be the case, leading to a new challenge of our time—namely, assuring human dignity when the very source of it for much of our existence in cultural evolution has begun to slip away from us.

How can we address this challenge? My idea pertains to the societal guarantee of basic life. It is often discussed under the rubric of universal basic income. Given what we know from our science, safety and security are prerequisites for meaningful social relations, exploration, and creativity (Bowlby, 1990), all of which become the basis for hard work. Hard work is expected to lead to success, which translates into a sense of dignity. Dignity must be earned, but it must be made earnable to begin with. Basic income is a means to protect each person's inalienable right to pursue and earn dignity. Basic income does not give dignity automatically. But it affords it, making it possible ➡

to attain and realize. This proposal is not advocacy for increased welfare in disguise. Nor is it meant to eliminate competition, which has been the single most important motivational basis of the success humans have earned over several millennia. Rather, it is meant to raise the sea level so every boat can start to float and sail again (Michael Kraus, personal communication, April 2, 2021).

One could worry that people might stop working upon receiving free money. I would respond by pointing to children born into wealthy families. They inherit wealth "for free," and their basic needs are abundantly protected by birth. Do they stop working as a result? A few undoubtedly do. But most don't. Children in rich families are guaranteed a chance for hard work, success, and thus an ample possibility for dignity. For those from less fortunate families, society must step in and secure a chance for hard work and success. Once this opportunity is guaranteed, most people will try to creatively and productively contribute to society. And this productivity must be rewarded. The more they work, the more they ought to be able to move upward in their life journeys. I submit that it is a moral obligation of APS to present some vision like this.

In closing

This concludes the series of my presidential columns. It was my pleasure to have this opportunity to write them. At the end of June, I will pass the baton to the next president, Jennifer Eberhardt. First, though, I will lead the Presidential Symposium during the 2021 APS Virtual Convention. The symposium will explore how we might achieve a theoretical integration of race, social class, and culture. Joining me in conversation will be an outstanding panel consisting of Hazel Markus, Michael Meaney, and Rob Sellers. I look forward to seeing you all, if only virtually, in a few weeks. ●

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A Tale of Two Modalities: Sign and Speech Influence Each Other in Bimodal Bilinguals

Francie Manhardt, Susanne Brouwer, and Asl Özyürek

Sign and speech appear to influence each other in bimodal bilinguals—hearing individuals who are fluent in both a sign language and a spoken language. In this experiment, when compared with hearing participants who did not know sign language, bimodal bilinguals showed the influence of sign language in their speech by expressing more specific information about the physical features of objects. Similarly, the bimodal bilinguals showed influence from speech in their signing by using fewer signs that conveyed information specific to sign language than deaf participants. Thus, exposure to both languages might enrich spoken language, which could be important for children with cochlear implants.

Psychological Science
https://doi.org/10.1177/0956797620968789

PSYCHOLOGICAL SCIENCE

Preregistered Replication of "Feeling Superior Is a Bipartisan Issue: Extremity (Not Direction) of Political Views Predicts Perceived Belief Superiority"

Elizabeth A. Harris and Jay J. Van Bavel

Toner and colleagues (2013) found that conservatives were more dogmatic than liberals, but both conservatives and liberals with extreme beliefs perceived their beliefs as superior to those of others. Harris and Van Bavel replicated these findings and verified that extremism varied by topic. However, the researchers also found that regardless of political beliefs, people with more extreme views also had higher dogmatism. These findings support the idea that dogmatism, extremism, and feelings of superiority appear to depend more on topic than on political view. Thus, researchers assessing differences between conservatives and liberals should study diverse topics.

https://doi.org/10.1177/0956797620968792

Misogynistic Tweets Correlate With Violence Against Women

Khandis R. Blake, Siobhan M. O'Dean, James Lian, and Thomas F. Denson

Misogynistic tweets in different areas across the United States appeared to be related to domestic violence in those areas. Blake and colleagues tracked misogynistic tweets in more than 400 areas and the incidents of domestic and family violence reported to the FBI in the same areas. Misogynistic tweets were a significant predictor of future domestic and family violence, which is perpetrated against women in more than 70% of the cases. Although these findings do not suggest that misogyny on social media causes violence against women, they do suggest that expressing prejudice against women tends to co-occur with domestic violence.

https://doi.org/10.1177/0956797620968529

Twin Differences in Harsh Parenting Predict Youth's Antisocial Behavior

S. Alexandra Burt, D. Angus Clark, Elizabeth T. Gershoff, Kelly L. Klump, and Luke W. Hyde

Harsher parenting (e.g., hitting children) appears to be associated with children's antisocial behavior (e.g., aggression, rule breaking) via environmental transmission rather than genetic transmission. In two samples of twins,

the twin exposed to more harsh parenting tended to display more antisocial behaviors, even when genetics was held constant (i.e., in monozygotic twin comparisons). These findings suggest that harsh parenting, including physical punishment, may increase children's antisocial behavior for nongenetic reasons, and are consistent with policies aimed at reducing physical punishment.

https://doi.org/10.1177/0956797620968532

The Dramatic Impact of Explicit Instruction on Learning to Read in a New Writing System

Kathleen Rastle, Clare Lally, Matthew H. Davis, and J. S. H. Taylor

Explicitly teaching writing regularities might help learners more than letting them discover those regularities by themselves, this study suggests. Over 10 days, adults learned to read novel words printed in two artificial language systems. One group learned spelling-to-sound and spelling-to-meaning mapping through experience (i.e., by reading the novel words), and another group received explicit instruction about those regularities before reading the words. Almost all the participants who received the instruction were able to generalize the regularities in the novel words, whereas only 25% of the participants who learned through experience were able to do so.

https://doi.org/10.1177/0956797620968790

Attitudes Based on Feelings: Fixed or Fleeting?

Matthew D. Rocklage and Andrew Luttrell

In seven studies, including analyses of real-world online reviews, Rocklage and Luttrell found that attitudes based on emotion are relatively fixed. The more emotional participants' opinions about brands or gifts were, the less their opinions changed over time. This effect was more pronounced for positive opinions than for negative opinions. In addition,

persuasive messages that evoked emotions were more likely to create persisting attitudes. These findings highlight how emotion may increase support for issues, individuals, or products.

https://doi.org/10.1177/0956797620965532

Adolescents' Stress Reactions in Response to COVID-19 Pandemic at the Peak of the Outbreak in Italy

Annalaura Nocentini, Benedetta Emanuela Palladino, and Ersilia Menesini

In Italy, stress at the peak of the COVID-19 pandemic was measured at high levels regardless of respondents' geographical location. Nocentini and colleagues surveyed 5,295 Italian adolescents and found that 28.9% of them showed moderate to high stress reactions, with older adolescents and females showing more stress than younger or male adolescents. The stress responses did not appear to depend on whether the adolescents' region was more or less affected by the pandemic. However, both direct experience with COVID-19 and indirect experience, via a friend or an acquaintance who was infected, were associated with stress reactions.

https://doi.org/10.1177/2167702621995761

Daily Life Positive Events Predict Well-Being Among Depressed Adults 10 Years Later

Vanessa Panaite, Andrew R. Devendorf, Todd B. Kashdan, and Jonathan Rottenberg

Higher daily positive affect and positive interactions with other people appear to predict higher psychological well-being among people with depression. For 8 consecutive days, participants with depression reported fewer positive events, higher negative

affect, and lower positive affect than participants without depression. However, those who reported higher daily positive affect, lower negative affect, and more social time were more likely to report higher well-being (e.g., life satisfaction, autonomy). These participants were also more likely to report higher well-being 10 years after the daily assessment.

https://doi.org/10.1177/2167702620956967

A Detailed Hierarchical Model of Psychopathology: From Individual Symptoms up to the General Factor of Psychopathology

Miriam K. Forbes et al.

Forbes and colleagues analyzed the structure of symptoms in an American clinical sample and an Australian general population sample. The symptoms spanned 18 disorders described in the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM*). Results indicated similarities between the two samples and a hierarchical structure of psychopathology organized into symptoms, syndromes, sub-subfactors, subfactors, spectra, and a general factor of psychopathology. In this model, both symptom-level data and higher-order dimensions departed from the diagnostic categories described in the *DSM*. These findings may help to improve methods in clinical research and practice.

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Disrupted Salience and Cingulo-Opercular Network Connectivity During Impaired Rapid Instructed Task Learning in Schizophrenia

Julia M. Sheffield, Holger Mohr, Hannes Ruge, and Deanna M. Barch

Rapid instructed task learning (RITL)—the ability to transform task information into goal-directed behavior without relying on trial-

and-error learning—is impaired in patients with schizophrenia. This research indicates that brain connectivity between the cingulo-opercular network (CON) and salience network (SAN) contributes to this impairment in patients with schizophrenia. These findings suggest that impaired interaction between identifying salient stimuli and maintaining goals contributes to RITL impairments in schizophrenia. Altered CON–SAN connectivity might be considered a vulnerability for poor skills learning in the daily life of individuals with schizophrenia.

https://doi.org/10.1177/2167702620959341

CURRENT DIRECTIONS IN PSYCHOLOGICAL SCIENCE

COVID-19 Prevention via the Science of Habit Formation

Allison G. Harvey, Courtney C. Armstrong, Catherine A. Callaway, Nicole B. Gumport, and Caitlin E. Gasperetti

Harvey and colleagues describe a set of strategies for forming new habits and eliminating existing habits to contain the spread of COVID-19. They highlight eight elements of habit formation that are connected to behavior-changing techniques and are important to understand for habit modification. These elements are addressing incorrect beliefs, setting goals, devising an action plan, establishing contextual cues for the desirable habits, reinforcing desirable habits, repeating desirable habits, aiming for automatic repetition of the behaviors, and recognizing that change is difficult. Strategies to form new habits and eliminate existing habits can be part of a behavioral intervention to promote habit formation for preventing COVID-19.

https://doi.org/10.1177/0963721421992028

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From Objects to Unified Minds
Moshe Bar

Bar presents a framework to describe the human experience. The framework connects objects, associations, contexts, predictions, and affect via an ongoing balance between top-down and bottom-up processes (i.e., higher-order cognitive processes influencing sensorial perception and sensorial perception influencing higher-order cognitive processes, respectively). He proposes that the state of mind, influenced by the balance of top-down and bottom-up processes, orients individuals to the optimal state to meet the needs of the moment. Bar argues that dynamic yet unifying states of mind influence one's mental world to orient dispositions, tendencies, and sensitivities to the demands of specific circumstances.

https://doi.org/10.1177/0963721420984403

PERSPECTIVES ON PSYCHOLOGICAL SCIENCE

Invisible Hands and Fine Calipers: A Call to Use Formal Theory as a Toolkit for Theory Construction
Donald J. Robinaugh, Jonas M. B. Haslbeck, Oisín Ryan, Eiko I. Fried, and Lourens J. Waldorp

Meehl (1978) identified several shortcomings in researchers' evaluation of psychological theories. He urged researchers to strengthen theory testing but did not provide the tools necessary to build the rigorous theories his approach required, argue Robinaugh and colleagues. They emphasize the importance of establishing what researchers are aiming for when constructing a theory, and they explain how formal theories might provide useful tools for thinking, evaluating explanations, enhancing measurement, informing theory development, and collaborating

in the construction of theories. These tools should make researchers better equipped to advance psychological theory, Robinaugh and colleagues argue.

https://doi.org/10.1177/1745691620974697

Citation Metrics in Psychological Science
Nina Radosic and Ed Diener

Radosic and Diener analyzed the citation counts for 811 scholars in 30 psychology departments in the United States. They found that most scholars have a low to moderate number of citations, and a few scholars have an extremely high number of citations. A researcher's total number of citations does not appear to be necessarily tied to their department's rank. Citation counts have risen in recent years, especially among early-career scholars. The number of citations at the beginning of one's career predicts lifetime citation success and is associated with obtaining positions at higher-ranked departments.

https://doi.org/10.1177/1745691620964128

Truth and Advocacy: Reducing Bias in Policy-Related Research
Phoebe C. Ellsworth

Ellsworth discusses the sources of bias in basic and applied research and suggests techniques for counteracting biases in policy-related research specifically. Many scientists who conduct policy-related research study issues they care about, thus leading to strong expectations about study outcomes and their impact on policy. These expectations can bias the evaluation, conduct, and communication of research. Ellsworth highlights several important techniques for reducing bias, including distinguishing between factual claims that are testable and value claims that are not, selecting the testable assumptions that may underlie various policy positions, and creating repositories of accurate information.

https://doi.org/10.1177/1745691620959832

Student Motivation and Associated Outcomes: A Meta-Analysis From Self-Determination Theory

Joshua L. Howard, Julien Bureau, Frédéric Guay, Jane X. Y. Chong, and Richard M. Ryan

Intrinsic motivation and behaving on the basis of perceived personal value and meaning appear to be key for school adjustment and student success. In this meta-analysis, Howard and colleagues examined how different types of motivation relate to 26 student outcomes, including performance and well-being. The researchers analyzed 344 samples of students and found that (a) intrinsic motivation was related to students' success and well-being, and (b) personal value (identified regulation) was related with persistence. Ego-involved motivation (introjected regulation) was related with persistence and performance but also with ill-being. Motivation to obtain rewards or avoid punishment was associated only with decreased well-being.

https://doi.org/10.1177/1745691620966789

The Practical Alternative to the *p* Value Is the Correctly Used *p* Value

Daniël Lakens

Lakens argues that discussing which statistics researchers should use instead of the *p* value has distracted from the core question of asking researchers what they are hoping to learn when they conduct research. He highlights that preventing the misinterpretation of *p* values by developing better evidence-based education and user-centered statistical software should be a priority to improve researchers' statistical inferences. Lakens suggests that pursuing alternatives to *p* values is a form of escapism and that a more effective solution would be to educate researchers on how to ask better questions and correctly use the statistics available, including *p* values.

https://doi.org/10.1177/1745691620958012

Assessing Change in Intervention Research: The Benefits of Composite Outcomes

David Moreau and Kristina Wiebels

Combining assessments might be a better way to evaluate the effectiveness of interventions than relying on individual measures, recommend Moreau and Wiebels. They argue that composite scores that pool information from single measures into a single outcome can provide better estimates of the underlying constructs of interest while retaining interpretability. The researchers describe different methods to compute, evaluate, and use composite assessments depending on different goals, experimental design, and data. They provide a preregistration template with examples of psychological interventions and the accompanying R code. They also provide a Shiny app and R code, available at osf.io/u96em.

Advances in Methods and Practices in Psychological Science
https://doi.org/10.1177/2515245920931930

ADVANCES IN METHODS AND PRACTICES IN PSYCHOLOGICAL SCIENCE

Analyzing Individual Differences in Intervention-Related Changes

Tanja Könen and Julia Karbach

Könen and Karbach discuss the benefits and limitations of analyzing individual differences in intervention studies in addition to analyzing only group effects. They suggest that analyzing individual differences cannot replace group analyses and provides only correlational and descriptive information about individuals and interventions. Individual-differences analyses can, however, enhance the future implementation of interventions. The researchers also discuss methods for analyzing individual differences and give three examples of latent change models as a framework for analyzing individual differences in interventions.

https://doi.org/10.1177/2515245920979172. ⏺

MISSING THE CROWD FOR THE FACES: THE CROWD-EMOTION-AMPLIFICATION EFFECT

Research indicates that individuals tend to focus their attention on the faces that exhibit the most extreme emotions, leading them to overestimate the crowd's actual emotional state. These findings have implications for public speaking as well as for controlling crowd demonstrations, among other tasks that require taking the temperature of a crowd.

In a recent article in *Psychological Science*, Amit Goldenberg, Erika Weisz, and Mina Cikara of Harvard University, Timothy D. Sweeny of the University of Denver, and James J. Gross of Stanford University used three preregistered experiments to examine how people perceive the emotions of crowds.

In the first experiment, 50 participants estimated the mean emotion displayed in sets of 1 to 12 faces. Each of the sets appeared on a screen for 1 second. The faces expressed emotions of different intensities on a neutral-to-angry or a neutral-to-happy continuum. The researchers found that the mean crowd emotion estimated by participants was higher than the actual mean crowd emotion, and the level of participants' overestimation increased with the number of faces in the crowd. In addition, the amplification of emotion was stronger for crowds expressing anger than for those expressing happiness.

In a second experiment, the researchers manipulated the amount of time different participants were exposed to the faces—1, 1.4, or 1.8 seconds—and found that longer exposures appeared to increase the emotion-amplification effect, rather than making participants' perceptions more accurate, as one might expect.

To understand the mechanism behind this crowd-emotion-amplification effect, Goldenberg and colleagues conducted a third experiment in which they tracked the gaze and eye movements of a separate set of 50 participants. Participants were found to spend more time looking at more emotional faces compared with less emotional faces. Moreover, participants who spent more time looking at the most emotional faces amplified the emotions of the crowd more than participants who spent less time attending to the most emotional faces.
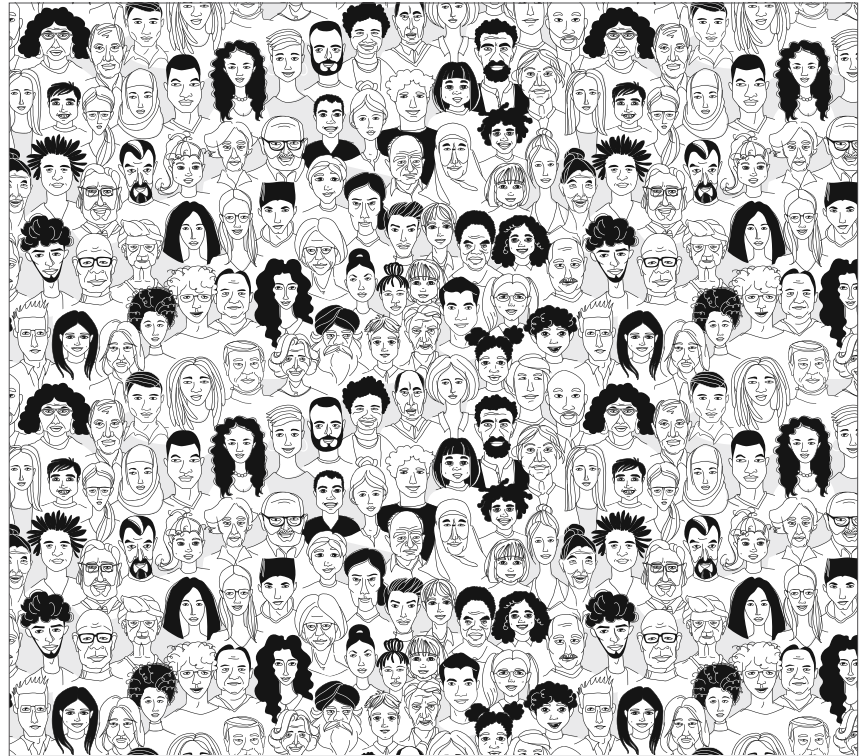
These findings indicate that individuals tend to spend more time looking at the more emotional faces in a crowd, which can lead them to overestimate the crowd's emotions, especially when the crowd is large or expressing negative emotions. The researchers noted that "these studies leave open several questions regarding how amplification is translated to perception and behavior outside the lab" and said further work should examine the amplification effect in more naturalistic settings, such as workplaces and political demonstrations, and test how different emotional distributions affect it.

Nevertheless, the findings may help to explain important aspects of social behavior and open the door to future interventions aimed at mitigating the amplification of crowds' emotions. These interventions are important because individuals are often asked to make quick decisions on the basis of snap judgments about others' emotions. ⚬

View this article with references at psychologicalscience.org/observer/crowd-emotions.

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PERSONALITIES CHANGE. WHY SHOULDN'T CAREER EXPECTATIONS?

As any parent or teacher can attest, adolescents aren't the most emotionally stable group of people. Yet it's during those fraught years that many young people set off on pathways that have profound implications for a lifetime's worth of career choices, including how much they make and how much they enjoy working.

But what if a person at 30 is very different from who they were at 16 or 17? Would they have pursued a different career or academic path if they had realized how much their personality would change—and how much they could potentially *shape* that change—during those formative years?

Research published in *Psychological Science* suggests that patterns of personality growth and maturation from adolescence to young adulthood have a greater bearing on career outcomes than adolescent personality traits and crystallized ability.

The formative years

Personality traits "reflect relatively enduring patterns of thoughts, feelings, and behaviors that predict success in a variety of occupations," Kevin A. Hoff, an assistant professor of psychology at the University of Houston, and colleagues wrote. "Research linking personality to career success has traditionally viewed personality as a stable set of variables that do not change meaningfully in adulthood."

Yet stability does not preclude change, they added, and young adulthood in particular is marked by formative developmental changes associated with maturation.

"On average, people become more conscientious, emotionally stable, and agreeable during young adulthood. These mean-level increases often occur in relation to career transitions that incentivize personality maturity," Hoff and colleagues explained.

In two studies, the researchers assessed representative samples of Icelandic youth (1,775 in all) over a period of approximately 12 years, from the ages of roughly 17 to 29. They examined whether personality changes during those years predicted five early-career outcomes: degree attainment, income, occupational prestige, career satisfaction, and job satisfaction. In analyzing mean-level changes in personality traits, they measured participants' "Big Five" traits—agreeableness, openness, conscientiousness, emotional stability, and extraversion—using the Icelandic version of the NEO Five-Factor Inventory.

Across both samples, participants experienced the largest mean-level increases in their agreeableness, openness, and conscientiousness. Their emotional-stability levels held constant, but their extraversion levels decreased. In tracking how changes in these traits correlated with career outcomes, the researchers found that increases in trait levels were most influential for emotional stability, which affected participants' income and career satisfaction; conscientiousness, which affected their career satisfaction; and extraversion, which affected both their career and job satisfaction. Adolescent personality traits, by contrast, proved consistently stronger predictors of degree attainment and occupational prestige relative to personality changes.

"These findings support the potential of policy actions aimed at improving human welfare by helping young people develop personality-based skills," the authors wrote. "Such initiatives may be effective at various periods throughout the early life span, not just during childhood and adolescence, as most mean-level personality development occurs during young adulthood." ●

View this article with references at psychologicalscience.org/observer/personality-careers.

BUT WHAT'S IT ALL FOR? PUTTING PRACTICAL THEORIES INTO ACTION

Research carried out by psychological scientists has brought about countless advances in humanity's well-being, equipping clinical practitioners, policymakers, and the public to improve our physical and mental health—but, in *Perspectives on Psychological Science*, APS Fellow Elliot T. Berkman and Sylas M. Wilson (University of Oregon) suggest a number of incentives to support the development of even more actionable theories in the face of what they term a "practicality crisis."

"We study topics that can so easily be applied to everyday life, yet rarely do we go out of our way to make the case of our relevance to the general public," Berkman and Wilson wrote. "Psychological theory might be developed in the lab, but an important purpose of this work is for the theories to be exported to other disciplines in which it can be put to use."

Practical theories, Berkman and Wilson explain, include theoretical components like causal predictions and hypothesis testing, but they primarily aim to uncover evidence-based steps people can take to address real-world problems, specifying the people and conditions to which the findings apply. This often involves community-engaged participatory research that incorporates feedback not just from participants in the lab but from the practitioners and members of the public who will make use of the research.

Practicality in publishing

It is relatively common for journals on medicine, human physiology, and clinical psychology to evaluate submissions on the basis of their potential to impact practice, Berkman and Wilson wrote. In an analysis of the 10 most-cited multidisciplinary psychology journals, the researchers found that just two required researchers to provide a description of their findings' significance to society, and only one required that articles should be understandable by the public.

Berkman and Wilson took a closer look at the *Journal of Personality and Social Psychology*, the most-cited journal on social psychology, by coding 360 articles published between 2012 and 2016 on the basis of six criteria: specificity of the issue addressed, understandability to someone at the general public's reading level, relevance to the population studied, conceptualization of a theory that can be used by nonscientists, prescription of actionable next steps, and dissemination of the results in an accessible format. Two research assistants scored each paper on each criterion, using a scale from 0% to 100%.

The average practicality score across papers, reflecting all six criteria, was 42.5%, with prescription of next steps and accessibly disseminated results—the two criteria rated most important by policymakers in past research—receiving the lowest ratings. Doubts about how effectively psychological theories can be implemented on a societal level may also have contributed to the decline in federal funding of psychological science over the past decade, Berkman and Wilson wrote.

"Public skepticism about the value of science in general, and randomized experiments on humans in particular, are significant barriers that we must overcome to convince federal policymakers of the value of psychological theory," the researchers wrote. ●

See the full article with references at psychologicalscience.org/observer/practical-theories.

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DON'T DITCH THE LAPTOP JUST YET: REPLICATION FINDS NO IMMEDIATE ADVANTAGE TO WRITING NOTES BY HAND

Over the past several years, findings related to the benefits of writing notes by hand versus typing notes have caused some educators to question the value of bringing laptops into the classroom—a debate that has been further complicated by the need to move many classrooms online amid the COVID-19 pandemic. But although previous work suggested that students who write notes by hand may retain information better than those who type them out on a laptop, attempts to replicate this research indicate that taking notes longhand may offer no measurable benefit.

"We found only small, statistically nonsignificant differences in quiz performance as a function of note-taking medium," whether students used a laptop or pen, wrote APS Fellow Heather L. Urry (Tufts University) and colleagues in *Psychological Science*. "Students and professors who are concerned about detrimental effects of computer note taking on encoding information to be learned in lectures may not need to ditch the laptop just yet."

Urry and colleagues reached this conclusion through a direct replication of a 2014 study by Pam A. Mueller (Princeton University) and APS Fellow Daniel M. Oppenheimer (University of California, Los Angeles), in addition to a mini meta-analysis of eight related studies.

Like Mueller and Oppenheimer, whose original study involved 67 undergraduate students at Princeton, Urry and colleagues tasked 145 undergraduate students at Tufts with viewing a recorded lecture while taking typed or handwritten notes. Each student then immediately took a quiz that consisted of a mix of questions involving factual recall and conceptual application.

In addition to scoring their answers, the researchers recorded the number of words in each student's notes, as well as the amount of word-for-word overlap with the lecture.

As in Mueller and Oppenheimer's study, no significant relationship was found between typed versus longhand note taking and factual recall. Both studies also found that students' typed notes contained more words and exhibited a greater degree of verbatim overlap than students' handwritten notes. Higher word count was associated with a better quiz score, whereas more word-for-word overlap was associated with worse performance.

Unlike Mueller and Oppenheimer, however, Urry and colleagues found no relationship between typed versus longhand note taking and conceptual recall. And their meta-analysis supported the conclusion that the effect of typing versus writing notes by hand was not statistically significant.

Unfortunately, the researchers add, the results also do not confirm that taking more notes in your own words leads to better quiz performance. Urry and colleagues did not directly measure the effects of word count or verbatim overlap, preventing them from drawing a conclusion on this matter.

As in the original study, the researchers noted, students were not permitted to review their notes before taking the quiz. It is possible, therefore, that typing versus writing notes by hand could influence performance when students have time to study the notes they have taken, Urry and colleagues added. ◉

View this article with references at

SOBC 101: MEASURING THE MECHANISMS OF BEHAVIOR CHANGE

The United States spent $9,892 per capita on health care in 2016, yet it has some of the worst health care outcomes of any high-income nation in the world. Although many chronic diseases and other deadly conditions could be prevented through both public policy and personal behavior, more work is needed to identify interventions that can effectively lower behavioral risk factors such as lack of exercise, overeating, and substance misuse.

"Behaviors are among the most important factors that help determine whether people—our patients, our friends—will live a long and healthy life, but few interventions work really well to lead to long-lasting behavior change," said APS Fellow Michael W. Otto (Boston University).

Otto spoke with Jeffrey L. Birk (Columbia University Irving Medical Center), alongside APS Director of Government Relations Andy DeSoto, as part of SOBC 101: The Science of Behavior Change for Psychological Scientists, a webinar recorded February 3.

Improving treatment adherence

The National Institutes of Health (NIH) Science of Behavior Change (SOBC) initiative was formed to support research on the basic mechanisms underlying health behaviors through grant funding and other processes. These efforts are aimed at reducing behavioral risk factors for disease as well as improving intervention adherence, Otto noted. For example, the majority of patients stop taking antidepressants—some of which require a year of use to achieve their full effect—within 12 weeks of receiving a prescription.

Generally speaking, innovations in health care, in addition to basic practices like attending medical appointments and getting vaccinated, require behavior change in order to benefit patients, he added.

A new way forward

Many expensive large-scale studies have investigated the effects of health care interventions, Birk said, but even well-reasoned studies can leave researchers with questions about why an observed effect occurred.

"It leaves you with a black box," he said. "You don't know, if the change occurs, why it occurred, and if it failed to occur, what was the reason."

The SOBC initiative aims to unite basic and applied researchers doing work related to these mechanisms by developing a common scientific method that can be shared across fields, Birk explained. This experimental method involves identifying mechanisms, directly measuring the mechanism in question, and observing the mechanism through randomized controlled trials.

That information, which may be gathered in a single study or through numerous studies, can then be used to identify how a specific mechanism contributes to changes in a certain behavior—for example, how a person's sense of self-efficacy relates to their level of physical activity.

Often, he continued, papers will mention a specific mechanism in their introduction, discussion, or conclusion, but the researchers won't directly measure that mechanism in the study. In the case of medication adherence, an NIH-funded review of 18 studies found that just 11% tested a hypothesized mechanism for behavior change.

The SOBC has brought together a number of resources, available at scienceofbehaviorchange.org, to assist with this goal. The measure repository, created through collaboration with the Busara Center's Open Instruments Project and the Experiment Factory, contains numerous measures and other open-access tools that align with the initiative's experimental process.

See the full article with video at psychologicalscience.org/observer/measuring-behavior-change.

TRAINING TO WISELY NAVIGATE SOCIAL CONFLICTS

Social conflicts, from policy debates to family disagreements, can easily devolve into angry words and personal attacks.

A better approach to resolving interpersonal disagreements, according to new research published in the journal *Psychological Science*, is to train yourself in advance to reason about interpersonal conflicts in a wiser manner.

"People typically fail to reason wisely when facing social conflicts, so we designed an intervention to help them," said Igor Grossmann, director of the Wisdom and Culture Lab at the University of Waterloo, Canada, and the lead author on the paper. "Our fundamental idea was to train people to see situations from a more detached, third-person perspective. This approach enables people to recognize the limits to their knowledge, acknowledge different ways the conflict may play out, and consider and balance multiple viewpoints."

The researchers' intervention is based on a rhetorical device called "illeism"—the practice of referring to oneself in the third person. Rather than saying "I feel hurt and angry," a person might tell themselves, for example, "He feels hurt and angry."

According to the researchers, by switching perspective from the first to the third person, a person becomes better able to evaluate their own knowledge and appreciate alternative views.

"A third-person viewpoint, however, is not the typical default position during a conversation or interaction," said Grossmann. "We believed that through practice and training it can be possible to slowly inculcate this more wisdom-centered approach into a person's conflict-resolution techniques."
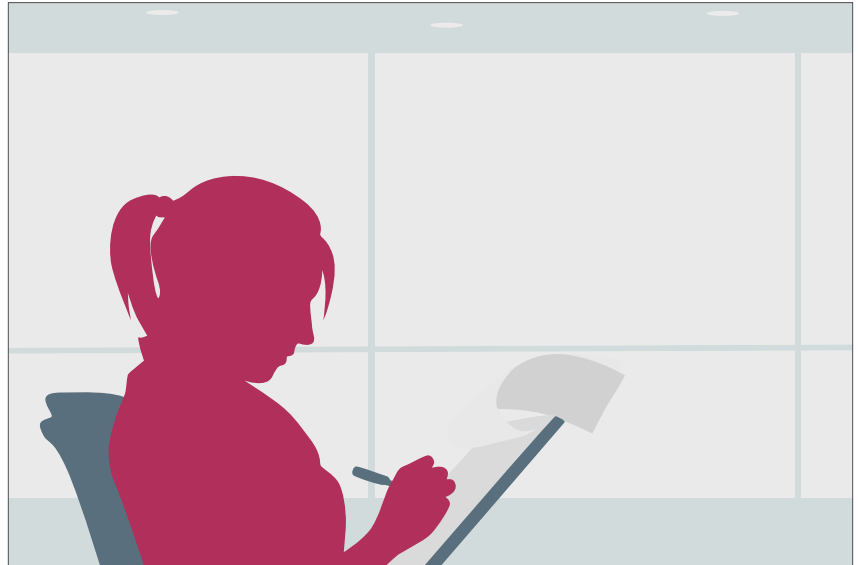
To test their hypothesis, the researchers conducted two field experiments.

In the first, participants were given an initial in-lab assessment to gauge their thoughts about a hypothetical social-conflict situation. They were then instructed to keep a month-long daily journal in which they wrote about each day's significant events. One group of participants wrote about their reflections in the first person. A second group did the same but in the third person.

At the end of the month, the participants were given a second in-lab assessment to see if the writing exercise impacted their reflections about another hypothetical social-conflict situation. The results revealed that the third-person writing group had developed a more wisdom-centric approach to how they thought about conflict. The first-person writing group showed much less change.

The second experiment involved a similar one-week writing assignment and evaluation, but it added a third group of participants who were given no instruction on how to write about their experiences. The results of the second experiment supported the conclusions of the first.

"Our research demonstrated effectiveness of the illeist diary writing for a change in wisdom compared to first-person and no-instruction diary reflections," said Grossmann. "After the intervention, distanced self-reflection led to incremental shifts in wise reasoning about personally challenging interactions."

The data suggest that this increase in wise reasoning occurred in part because distanced self-reflection broadened people's typically narrow self-focus. ◉

Reference

Grossmann, I., Dorfman, A., Oakes, H., Santos, H., Vohs, K., & Scholer, A. (2021). Training for wisdom: The distanced-self-reflection diary method. *Psychological Science*. Advance online publication. https://doi.org/10.1177/0956797620969170

OUT OF THE BOX AND INTO THE LAB, MIMES HELP US 'SEE' OBJECTS THAT DON'T EXIST

When we watch a mime seemingly pull on a rope, stumble over an obstacle, or push against the sides of a transparent box, we don't struggle to recognize the implied objects—our minds automatically construct vivid representations of them, even though they are not actually seen.

To explore how the mind processes and identifies these fictitious objects, researchers brought the art of miming into the lab. Their results reveal that humans mentally represent invisible, implied surfaces both rapidly and automatically.

"Most of the time, we know which objects are around us because we can just see them directly. But what we explored here was how the mind automatically builds representations of objects that we can't see at all but that we know must be there because of how they are affecting the world," said Chaz Firestone, an assistant professor who directs Johns Hopkins University's Perception & Mind Laboratory and the senior author on a paper published in the journal *Psychological Science*. "That's basically what mimes do. They can make us feel like we're aware of some object just by seeming to interact with it."

To study this phenomenon, Firestone and his colleagues had a group of 360 participants watch clips in which Firestone himself mimed colliding with a wall and stepping over a box in a way that suggested those objects were there, only invisible.

Afterward, a black line appeared in the spot on the screen where the implied surface would have been. This line could be horizontal or vertical, so it either matched or didn't match the orientation of the surface that had just been mimed. Participants had to quickly identify the line's orientation. The researchers found that people responded significantly faster when the line aligned with the mimed wall or box, suggesting that the implied surface was already represented in their minds—so much so that it affected their responses to the visible surface they saw immediately after.

Participants had been told not to pay attention to the miming, but they couldn't help but be influenced by those implied surfaces, said first author Pat Little, who helped conduct the research as an undergraduate at Johns Hopkins and is now a graduate student at New York University.

"Very quickly people can realize that the mime is misleading them and that there is no actual connection between what the person does and the type of line that appears," Little said. "But even if they think, 'I should ignore this thing because it's getting in my way,' they can't. That's the key. It seems like our minds can't help but represent the surface that the mime is interacting with—even when we don't want to." ○

🎙 **Listen Online!**

Chaz Firestone (Johns Hopkins University) and Pat Little (New York University) talk with APS's Charles Blue about this research in a new episode of *Under the Cortex*, the APS podcast.

IS BURNOUT DEPRESSION BY ANOTHER NAME?

Burning out at work can strike a powerful blow to well-being, but a meta-analysis by Renzo Bianchi (University of Neuchâtel, Switzerland) and colleagues in *Clinical Psychological Science* suggests that it may not constitute a discrete clinical condition. Instead, "burnout" could be a form of job-related depression.

Burnout is generally agreed to arise from "insurmountable, chronic workplace stress," often as a result of a misalignment between an individual's personal disposition and the demands of their workplace. In order for burnout to be considered a distinct syndrome, however, Bianchi and colleagues wrote, its proposed symptoms would need to be associated more closely with each other than with the symptoms of another known condition, such as depression.

"Overall, our results suggest that burnout does not present the unity expected of a distinct syndrome," the researchers wrote. "Burnout's core—Exhaustion—more frequently co-occurs with depressive symptoms than with either Detachment or Efficacy… in other words, the core of the burnout syndrome is depressive in nature."

In the meta-analysis of 14 studies, which involved data from 12,417 participants in six countries (France, Finland, New Zealand, Spain, Sweden, and Switzerland), Bianchi and colleagues examined the overlap of the symptoms of burnout and depression. The researchers focused specifically on how the set of three symptoms proposed to be unique to burnout—exhaustion, detachment, and low professional efficacy (a person's sense of their own ability to effect change)—related

to an aggregate score of depression. This measure of depression included a range of symptoms such as anhedonia (loss of pleasure and interest), low mood, fatigue, interpersonal distancing, and irritability.

The three proposed symptoms of burnout were more closely correlated with depression (.60) than with each other (.51). Exhaustion in particular showed a strong correlation with depression (.80).

"Correlations of the magnitudes found here are commonplace among measures deemed to assess the same entity," Bianchi and colleagues explained. "Burnout cannot be regarded as a syndrome distinct from depression if its core dimension, exhaustion, correlates more strongly with depression than with its other components."

These findings are in no way intended to dismiss the severity of burnout, Bianchi and colleagues noted—to the contrary, incorporating

burnout into the clinical concept of depression could help strengthen the legal footing of regulations related to workers' health while providing clearer avenues for treatment.

"The line currently drawn between burnout and depression tends to suggest that burnout is not as serious a problem as depression," Bianchi and colleagues wrote. "By repatriating the topic of job-ascribed suffering in the long-established framework of depression, one has an opportunity to deal more effectively with these forms of suffering."

Such interventions would still need to address the environmental context—in this case, a workplace's organizational policies and social environment, which may interact with workers' dispositions—to effectively provide relief for depression. ◉

See the full article with references at psychologicalscience.org/observer/burn-out-depression.

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The Teaching Fund was established with the support of The David and Carol Myers Foundation.

POLICY WATCH: INCREASING ATTENTION TOWARD BEHAVIORAL SCIENCE

There's no science-focused government arm closer to the U.S. president than the White House Office of Science and Technology Policy (OSTP), one of the groups comprising the president's executive office. That's why it's a big deal for the behavioral and social sciences that President Biden named sociologist Alondra Nelson, formerly of the Institute for Advanced Study, to the new post of deputy director for science and society at OSTP.

"Never before in living memory have the connections between our scientific world and our social world been quite so stark as they are today," reflected Nelson in a January address.

In a recent letter, APS Executive Director Robert Gropp congratulated Nelson on her new role and encouraged further conversation on the contributions that psychological science can make to benefit the public.

"APS stands ready to work with you to promote needed scientific discoveries and the use of high-quality and peer-reviewed science to inform public policy

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NIH Extends Flexibilities for Registration and Reporting of Research Results

A set of policies that would affect NIH-funded basic experimental studies with humans, opposed by APS, has been delayed another two years.

Several years ago, NIH announced an expanded definition of clinical trials that newly encompassed basic research with humans while introducing new policies affecting registration, results reporting, and other components of the scientific process for this research area. Although APS is supportive of research registration and transparent reporting, APS and other behavioral science groups criticized the specific NIH policies, arguing that they were poorly designed for psychological science and related fields.

In partial response to these criticisms, NIH announced a period of flexibility for aspects of registration and reporting that was set to expire later this year. A new NIH notice (NOT-OD-21-088), however, dated March 23, extends this period of flexibility through September 24, 2023.

Although APS continues to urge NIH to not classify behavioral research as clinical trials, this extended flexibility period will enable APS members to continue to register and report in places that they deem best for their work. As always, however, APS recommends that scientists read these policies carefully and consult with a program officer at all stages of the grant process.

Did you know? APS's government relations team is in regular touch with the U.S. Congress and representatives of key science funding agencies around the world that support psychological science. In February and March of this year, APS representatives met with House and Senate offices—virtually, of course—to talk about the issues described above and more. Your APS membership helps support these important initiatives!

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decision-making," wrote Gropp. Read the full letter at bit.ly/2QHC8W1.

As Biden's OSTP takes shape, the scientific community eagerly awaits the confirmation of a director to lead the office. At the time of writing, Biden's nominee, mathematician Eric Lander, has not yet been confirmed by the Senate for the job. The OSTP director position was vacant for approximately 2 years into President Trump's term until meteorologist Kelvin Droegemeier was confirmed for the role.

Zooming in on behavior at NIH

An APS priority when meeting with policymakers is discussing the importance of the study of behavior to improving human health. That's why APS was delighted when, in late 2020, Congress called on the U.S. National Institutes of Health (NIH) to study how NIH can make better use of behavioral science to benefit health. Now, NIH is responding to this call; in January, its Office of Behavioral and Social Sciences Research (OBSSR)—which coordinates behavioral research at NIH—announced a new study to assess how behavioral science and its contributions to improving health can be better integrated and realized across NIH as an agency.

APS is hopeful that this important study will reveal new ways for ➡

NIH to leverage, incentivize, and invest in behavioral research across the agency. In a March letter to OBSSR, APS urged NIH to take a full assessment of the status of behavioral science at NIH and ensure that behavioral science research is supported at the levels required to improve health. Read the full letter at bit.ly/3rze7gJ.

An "Endless Frontier" before us?

The scientific community is on the collective edge of its seat awaiting news on a piece of U.S. legislation titled the Endless Frontier Act, a bill introduced in 2020 by now–Senate Majority Leader Chuck Schumer (D-NY) that quickly garnered bipartisan support yet did not advance to a vote. Capitol Hill insiders expect that an updated version of this bill is likely to emerge soon.

Discussions around the Endless Frontiers Act are of significant interest to the psychological science community, given that earlier drafts of the act proposed a significant restructuring of the U.S. National Science Foundation (NSF), one of the key funders of psychology research. Although Endless Frontiers proposes significant budget increases for NSF, it also suggests infrastructure changes that could alter the agency's mission of supporting basic science. For instance, it proposes the creation of a new technology directorate within the agency whose funding and authority would significantly overshadow that of other directorates—including the ones focused on behavioral and social science and education, which award many of NSF's psychological science grants.

Throughout 2020, APS seized several opportunities to offer feedback on plans surrounding the Endless Frontiers Act. This feedback has emphasized appreciation for Congress's attention to and interest in NSF while encouraging that NSF keep its focus on protecting and growing basic research, including psychological science.

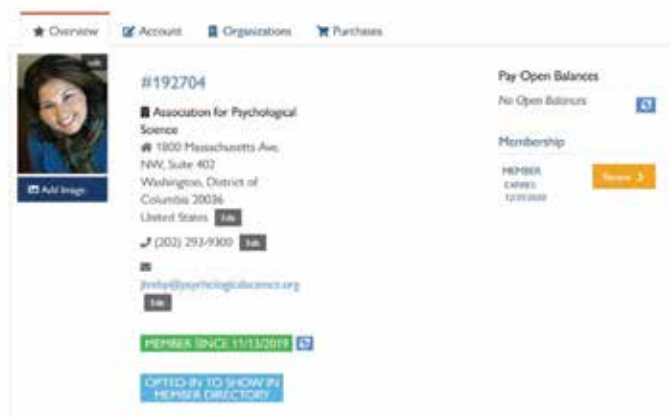As of this writing, experts expect this bill to move quickly once momentum reemerges. Be sure to check psychologicalscience.org/policy for updates on the Endless Frontiers Act and other issues. ◉

— **Andy DeSoto**
APS Director of Government Relations

OES COLLABORATIONS ECHO FEDERAL PRIORITIES

By **Heather Kappes**

Hard to believe, but I'm writing this 6 months into my year as an Office of Evaluation Sciences (OES) fellow. One of the early projects I contributed to is available on the OES website now: a descriptive study of small business COVID-19 grant and loan programs and the barriers to equitable access that different program models might create.

It was important to share that work quickly because COVID-19 small business relief programs are ongoing. The descriptive study is different from typical OES work, which most often involves randomized controlled trial evaluations. Instead, it aspires to help local governments better recognize and potentially address some of the costs and benefits of different ways of deciding which businesses receive assistance.

OES serves the public by helping government agencies build and use evidence. This involves work on all kinds of projects, from vaccination uptake to benefits claiming to tax filing and energy use. What those projects have in common is a link to an outcome that a government agency has identified as a priority.

One recent U.S. government priority is linked to the Memorandum on Restoring Trust in Government Through Scientific Integrity and Evidence-Based Policymaking, signed by President Biden on January 27. That memo instructs U.S. federal agencies to consider a variety of methodological approaches to evidence building, including "approaches that may be informed by the social and behavioral sciences." A renewed federal emphasis on evidence-based policymaking, alongside a mention of social and behavioral sciences, may stimulate new OES collaborations.

The Biden administration has used other memos, letters, proclamations, and executive orders to identify priorities in specific policy areas. For example, the Executive Order on Advancing Racial Equity and Support for Underserved Communities Through the Federal Government states that "the Federal Government should pursue a comprehensive approach to advancing equity for all, including people of color and others who have been historically underserved, marginalized, and adversely affected by persistent poverty and inequality." With equity as a federal priority, there may be ways to follow up on projects like the small business relief work, which I'd be really excited about.

One aspect of OES work I didn't anticipate before joining was the value of what OES calls a "service-oriented mindset." As academic researchers, we often approach new projects thinking about what we would like to know or looking for good opportunities to test a favorite hypothesis. The most effective researchers at groups like OES seem instead to approach a project by identifying what the collaborator needs to know and then thinking about the best ways to answer those questions. Instead of participating in a project to serve your own research interests (or your next publication), you're serving the agency and the public.

Adopting this service mindset has changed the way I read the literature, talk to others about their work, and pitch projects. It's a mindset that groups like OES may look for in hiring, so if you're interested in this kind of work, you may want to cultivate it in yourself too. I imagine it's a useful approach no matter the administration (or country, for that matter). ◉

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

NATIONAL INSTITUTE OF MENTAL HEALTH R15 RESEARCH ENHANCEMENT AWARD

Kimberly Chiew, an assistant professor of psychology at the University of Denver, shares insights on this award.

The U.S. National Institute of Mental Health (NIMH) is one of the leading institutions for mental health research worldwide. A strong supporter of psychological science, NIMH offers many grant opportunities that fund science, enable training, and enhance the research process. In 2020, NIMH's budget was roughly $2 billion, with most funding going toward extramural research grants outside of NIMH.

An important funding mechanism from the National Institutes of Health (NIH), of which NIMH is a part, is the Research Enhancement Award, or R15. These awards support institutions that do not traditionally receive large-scale or substantial funding from NIH. They also emphasize research experiences for students (undergraduate through postdoctoral) by amplifying the research environments of the awardees' institutions.

Kimberly Chiew, an assistant professor in the Department of Psychology at the University of Denver and the director of the DU Motivation, Affect, & Cognition Lab (dumaclab. org), received the R15 grant in 2018

for her research project titled "Beyond Reward: Approach and Avoidance Motivation Generate Functional Contexts for Cognitive Control and Adaptive Memory." APS spoke with Chiew about her research, the grant, and more.

Grant Information

- **Country:** United States
- **Organization:** National Institutes of Health
- **Institute:** National Institute of Mental Health
- **Grant Mechanism:** Research Enhancement Award (R15)
- **Amount:** $456,753 USD

Kimberly Chiew

What is the R15 mechanism, and who should consider applying for one?

The goal of the R15 mechanism is to support research projects at educational institutions that provide baccalaureate or advanced degrees to individuals who will go on to pursue careers in scientific research, but that have not traditionally been major recipients of NIH support. To be eligible, your home institution must have received less than $6 million in NIH support in 4 of the last 7 fiscal years. Additionally, the goals of the R15 mechanism are to support meritorious research, strengthen the research environment of the institution, and expose students to research. This makes the R15 a great funding mechanism for research scientists working at institutions with a smaller biomedical research

infrastructure. The R15 encompasses two programs: the Academic Research Enhancement Award (AREA) for undergraduate-focused institutions, and the Research Enhancement Award Program (REAP) for health professional schools and graduate schools. Note that these two programs were separated in 2019, after I received my award. My award was written specifically to support both graduate and undergraduate research training.

What are you researching?

I'm a cognitive neuroscientist interested in how emotion and motivation influence cognitive processes, with a focus on cognitive control and memory. The overarching goal of my research program is to advance our understanding of goal-directed human behavior. I see characterizing both motivated control and memory processes and how they interact as key to this understanding. While I use multiple methods to investigate my research questions (including a mix of laboratory and naturalistic paradigms) and have lines of work focusing on both cognitive control and memory separately, my R15 proposal specifically uses fMRI and transcranial magnetic stimulation (TMS) methods to examine and compare neural circuits involved in approach- versus avoidance-motivated cognitive control and subsequent memory, particularly focusing on the role of the prefrontal cortex.

Our goal is to understand how different motivational contexts shape cognitive processes in both the control and memory domain as well as characterize how control processes might shape memory encoding under these contexts. While we've experienced some delays

Kimberly Chiew with students and researchers from the University of Denver Motivation, Affect, and Cognition Lab.

related to COVID-19 (including both our fMRI and TMS research facilities temporarily closing due to the pandemic), we're fortunate to be making progress with the project. Additionally, this project has generated research opportunities for trainees in my lab at the graduate, postbac, and undergraduate level—it's been a big team effort. I think it's been particularly exciting for undergraduate trainees new to research to get this exposure to cutting-edge methods in cognitive neuroscience and experience working on a large-scale project together.

How has NIMH funding supported your research efforts?

This project wouldn't be possible without support from NIMH.

Neuroimaging and neurostimulation research are time and resource intensive, and our funding helps cover operating and personnel costs needed for the project to happen. As an early career researcher, this funding really helped jumpstart things and get my research program going.

What was the application process like?

I originally developed this project proposal as part of a K99, an NIH funding mechanism designed to help postdocs transition into faculty positions, that I submitted to NIMH as a postdoctoral trainee. While my K99 was not funded, I got great feedback on my proposal from my reviewers and was able to revise the project to submit for

the R15 mechanism as a new faculty member. My program officer at NIMH and mentors at both my postdoctoral and faculty institutions were very helpful in this process. I found the paperwork very daunting during my first time applying for NIH funding (the K99 submission). It was a bit easier when applying for the R15 because of that prior experience.

What advice do you have for researchers applying for NIMH grants or this type of grant mechanism specifically?

The R15 grant mechanism really prioritizes student research training and building the institutional research environment. As such, well-thought-out plans for how the proposed project will provide research training opportunities for students and build synergy with other student learning opportunities at the host institution are very important. Additionally, the R15 has a smaller budget than some other NIH grant mechanisms (such as the R01), so you want to propose a project of appropriate scale. Finally, communicate with your program officer as you are developing your submission—they can provide very helpful feedback on whether your project is in line with NIH funding priorities.

For more about the NIMH R15 Research Enhancement Award, visit nimh.nih.gov/funding/opportunities-announcements/research-enhancement-awards-r15s.shtml. ◗

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

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

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Misinformation: Psychological Processes and Social Network Mechanisms

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See more in the online program

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The Environment and Us

The psychological science of confronting climate change and cultivating sustainable societies

The World Health Organization estimates that air pollution causes 7 million premature deaths every year. Bulgaria, where this photo was taken, has the highest rate of these deaths in Europe.

SURVIVING OURSELVES WHEN THE CLIMATE CHANGES

By Ludmila Nunes, APS staff

From heat waves in Greenland to flooding in Kenya, the climate is changing. As temperatures increase, ice caps melt, oceans get warmer, sea levels rise, precipitation patterns change, and climate-related disasters pile up, humans' physical and mental health is endangered, too.

The negative effects of climate change disproportionately affect populations that are more vulnerable because of their locations, inadequate infrastructures, or demographic characteristics, but everyone is at risk. The World Health Organization (WHO) has stated that climate change affects many of the social and environmental determinants of health, including clean air, safe drinking water, sufficient food, and secure shelter. And the U.S. Global Change Research Program, in a 2016 report, noted that through interactions with health, demographic, and socioeconomic factors, climate change exacerbates existing health threats and creates new public health challenges.

Psychological science has helped reveal how exposure to the consequences of climate change affects people's mental health. Researchers in diverse fields of psychology have also studied individuals' preparation for and responses during disasters so that fewer people will have to experience them. Moreover, psychological science sheds light on the complexity of human decision-making and the social and environmental factors that affect the behavioral changes needed to slow down climate change and its consequences. Here's a look at what the science tells us about what happens after, during, and before natural disasters.

Climate change and natural disasters

Natural disasters, which are often a direct result of climate change, can have profound effects on individuals and communities. Take 2020's massive wildfires in California, Brazil, and Australia. In California, 9,639 fires burned 4,397,809 acres, destroyed more than 10,000 structures, and caused $12 billion in damages. The fires in the wetlands of Pantanal in Brazil, three times as large as those the year before, put local Indigenous communities and Brazil's ➡

Climate Change: The Facts

Climate change has been accelerated by human activities, especially the burning of fossil fuels, that have released carbon dioxide and other greenhouse gases in high enough quantities to trap heat in the lower atmosphere, leading to global warming. According to the WHO, in the last 130 years, the world has warmed by approximately 1.53 degrees Fahrenheit (0.85 degrees Celsius). Although this level of warming might not seem like much, it is enough to change precipitation patterns and increase the frequency and intensity of extreme weather events. The number of reported weather-related natural disasters has more than tripled since the 1960s, and these disasters result in over 60,000 deaths every year. In a fact sheet about climate change and health, the WHO reported that:

- Extreme heat contributes directly to deaths from cardiovascular and respiratory disease, particularly among elderly people, and exacerbate cardiovascular and respiratory disease.

- Extreme heat increases the levels of pollen and other allergens, which can trigger asthma.

- Rising sea levels and increasingly extreme weather events will destroy homes, medical facilities, and other essential services. Given that more than half of the world's population lives within 37 miles (60 km) of the sea, many people may be forced to move.

- Increasingly variable rainfall patterns are likely to affect the supply of fresh water. This can compromise hygiene and increase the risk of diarrheal disease, which kills more 500,000 children younger than 5 every year.

- Variable precipitation and rising temperatures can lead to drought and affect food production, increasing risk of famine and malnutrition, which currently causes 3.1 million deaths every year.

- Floods and extreme precipitation can contaminate freshwater supplies, heighten the risk of water-borne diseases, and create breeding grounds for disease-carrying insects such as mosquitoes.

- Changes in climate are likely to lengthen the transmission seasons and expand the geographic range of deadly vector-borne diseases.

In 2020, wildfires worsened by climate change burned roughly a quarter of Brazil's Pantanal wetlands.

unique wildlife at risk. Australia's 2019–2020 bushfires killed or displaced nearly 3 billion animals, destroyed more than 5,900 buildings (including 2,779 homes), and killed at least 34 people.

In addition to causing material losses, climate disasters take a toll on physical and mental health. In 1667, diarist Samuel Pepys described his lingering fear, distress, and anxiety after the Great Fire of London 6 months earlier. In 2010, APS James McKeen Cattell Fellow George A. Bonanno (Columbia University) and colleagues wrote that the consequences of disasters can include posttraumatic stress disorder, grief, depression, anxiety, stress-related health costs, substance abuse, and suicidal ideation.

However, although climate disasters can cause trauma and psychological problems, they can also reveal resilience—the ability to return to the predisaster status quickly.

After a disaster: Distress and resilience

In their article, published in *Psychological Science in the Public Interest*, Bonanno and colleagues analyzed the most scientifically sound research and concluded that although people exposed to disasters show diverse psychological problems, fewer than 30% of these individuals experience severe levels of these problems. More than half experience only transient distress, maintain a stable trajectory of healthy functioning, and recover their psychological equilibrium within 1 or 2 years, if not sooner. In his James McKeen Cattell Fellow Award Address at the 31st APS Annual Convention in 2019, Bonanno reinforced the idea

See Inside the Psychologist's Studio with George A. Bonanno at psychologicalscience. org/observer/jan-feb21-itps**.**

that the "resilience trajectory is not only most common, it's the majority."

Bonanno and colleagues also concluded that unique risk and resilience factors can inform individual differences in disaster outcomes. Factors relate to the context in which the disaster occurs, proximity to the disaster, and the disaster's aftermath. For instance, disaster survivors often receive immediate support from their families, relatives, and friends. For this reason, many survivors subsequently claim that the experience brought them closer together, Bonanno and colleagues wrote.

However, the stress of disasters can also erode interpersonal relationships and sense of community, the researchers warned, even among people hundreds or thousands of miles from a disaster's geographic location. Psychopathology is likely only among populations with preexisting susceptibility (e.g., prior trauma or psychiatric illness) or actual remote exposure (e.g., loss of a loved one in the disaster).

Robin Goodwin (University of Warwick, England) and colleagues examined psychological distress in the years following the March 2011 Great East Japan Earthquake, tsunami, and nuclear leak. In their 2020 study, published in *Clinical Psychological Science*, the researchers found results similar to those described by Bonanno: Most individuals were resilient. Annual surveys of 2,599 survivors, from 2012 to 2016, showed four trajectories of distress: 76% were resilient, with consistently low distress; 8% experienced delayed distress, characterized by low distress at first that increased over time; 8% were in recovery, with high distress at first that decreased over time; and 7% experienced chronic, consistently high distress. Resilient individuals tended to have more social support than the others. Another finding

The flooded Lake Forest area of New Orleans, Louisiana, after Hurricane Katrina, as buildings burned out of control in the background.

A person's response to a disaster often starts before the event itself.

was that the individuals in the recovery group were more likely to live in prefabricated housing than those in the other groups, indicating that an individual's physical context can influence how they are affected by and respond to disasters.

As noted, the survivors showed different postdisaster trajectories, including varied levels of distress and paths to resilience. Individual differences not only play a role in shaping these trajectories but also appear to contribute to determining who is likely to survive a disaster in the first place—and who is not.

During a disaster: Fight, flight, or freeze

In her book *The Unthinkable*, published in 2008, journalist Amanda Ripley talked to disaster survivors and scientists to understand the thought processes of people who are more likely to survive extreme events, including Hurricane Katrina in New Orleans in 2005. "If we get to know our disaster personalities before the disaster, we might have a slightly better chance of surviving," Ripley wrote.

Experiencing a disaster leads to a three-phase process, Ripley proposed: denial, deliberation, and the decisive moment. Denial is the initial shock phase and can take the form of delay in responding. The time spent in denial is affected by how an individual calculates risks. After denial, a phase of deliberation settles in, where individuals must make decisions while facing the abnormality of the situation and dealing with fear. Finally, in the decisive moment, people take action—they can panic, freeze, or save themselves—and potentially others.

People who are more aware of their true risks have better chances of surviving an extreme event because they are less likely to spend time in denial, Ripley suggested. Awareness of the tendency to engage in denial could motivate a person to plan ahead, before a disaster, to avoid panicking or freezing. The issue is that humans are known for making biased judgments and miscalculating risks (e.g., Kahneman & Tversky, 1979). Therefore, beyond awareness of true risks, understanding how one might react when scared might help increase survival. Ripley cited neuroscience research supporting the idea that people who recognize their responses to fear might find it easier to control their emotions and take the right actions at the right time during an extreme event. Knowing one's bodily instincts and anxiety patterns or tendency to panic might also help one respond appropriately to disasters.

Before the disaster: Prepare and warn

In fact, a person's response to a disaster often starts before the event itself, such as with a weather advisory. Floods, earthquakes, and storms can usually be predicted. Having a plan for dealing with natural disasters can influence survival.

Dennis Mileti, who passed away this January, was the former head of the Natural Hazards Center at the University of Colorado Boulder and an expert in disaster communication. In his 1999 book, *Disasters by Design: A Reassessment of Natural Hazards in the United States*, he discussed how demographic, climate, social, and individual factors have influenced losses from and management of disasters. He also suggested shifts in thinking about natural hazards to facilitate coping with natural disasters and reduce their costs. His proposed approaches: (a) adopting a global systems perspective, (b) accepting human responsibility for disasters, (c) anticipating ambiguity and change, (d) rejecting short-term thinking, (e) taking a broader view of social factors and their role in disasters, and (f) embracing the principles of sustainable development, defined as increasing a community's ability to overcome damage, diminished productivity, and reduced quality of life from an extreme event without significant outside assistance.

In a 2018 talk prepared for the Federal Emergency Management Agency, Mileti also called to modernize public warning messaging. He suggested five strategies for effective communication around disasters:

- Focus first on alerts for imminent events.

- Remove delays from warning systems, such as issuance and dissemination delays.

- Create detailed plans (e.g., specify the observations used to identify threats and corresponding threat levels, along with options for protective action, such as evacuation routes or areas to avoid).

- Disseminate warning messages wisely, using multiple channels and a mix of technologies so that they can reach multiple populations more quickly.

- Issue messages that reduce delays. For instance, provide details that mitigate the natural human impulse to search for more information before taking protective actions.

Public warnings, Mileti clarified, should provide the information people might be inclined to search for before taking protective action. Messaging content, style, and frequency of delivery appear to highly influence the public's response to warnings. He recommended that messages be specific (e.g., "If you are between the river and First Street, move north of Main Street" instead of "Evacuate if you are near the river") and clear (e.g., "A wave of water 20 feet high is moving faster than a person can run" instead of "A 10,000 cubic-feet-per-second flow is moving at 20 feet per second"). Mileti also suggested that messages should convey the source of the warning, the hazard, personalized location information, potential consequences, information on protective action—including what people can do, how long they have to do it, and why it will work—and the warning's expiration time.

Behavioral changes to fight climate change

Understanding that climate change is one of the key causes of natural disasters can not only improve people's chances of surviving but also encourage sustainable behaviors that might help to slow climate change and, consequently, the frequency of natural disasters.

APS Fellow Elke Weber (Princeton University) has studied how psychological science can help individuals and policymakers design decision environments that capitalize on human capabilities and goals to make wise decisions, including those impacting sustainability and the quality of the natural environment. Climate change demands behavioral change, she wrote in a 2015 article published in *Social Research*. "It is helpful and, in fact, imperative to consider and use the full range of human motivations and goals and the full range of decision processes available to *Homo sapiens* as we consider action and behavior change in the context of climate change."

Although climate change is undeniably happening, there is still uncertainty about its consequences and the most appropriate actions. Individuals might focus on uncertainties inherent to specific predictions about climate change and to use them as an excuse to delay action. Yet humans are proactive in protecting against other uncertain scenarios—for instance, in buying car and home insurance. Paul Slovic (1987) showed that when individuals perceive a threat as temporally closer and more personally relevant, they are more likely to take actions to protect themselves.

Informing the public about the threats posed by climate change might not be enough, however. Research has also shown that humans are creatures of habit who learn by trial and error and use shortcuts and emotions to make decisions. These heuristics are, in many cases, more efficient than analytical risk analyses involving complicated calculations (e.g., see Gigerenzer & Selten, 2002). But in other instances, they might hinder necessary change.

Addressing Climate Change and Its Psychological, Ethical, and Socioeconomic Challenges
A panel discussion on this topic will be held during the 2021 APS Virtual Convention, May 26–27, 2021. For details and to register, visit psychologicalscience.org/convention.

Weber highlighted the importance of considering the broad number of goals that humans have. "The problem is typically not that we do not know what we want; instead decisions are often difficult because we want too many and at times conflicting things," she wrote. Because of limited attention, humans are also prone to oppose change—a preference known as status quo bias. All of these factors—multiple competing goals, status quo bias, and the human tendency to focus on here and now, including costs in the service of future benefits—undermine climate change action.

Weber suggests three strategies for facilitating behavior change: making sustainable options the default, so that choosing unsustainable options requires action; changing the status quo itself, so that individual resistance to change works in favor of sustainable action; and rephrasing and reframing choice option labels in a manner that nudges individuals to make environmentally sound choices (e.g., individuals might be more willing to pay a "carbon offset" fee than a "carbon tax"). In addition to these strategies, focusing on the positive consequences of actions might foster needed responses to climate change. "This may involve a new conceptualization of human happiness… away from the current model that is consumption based which puts us on a hedonic treadmill and endangers the global climate and environment," wrote Weber.

Another strategy to increase engagement with climate change and other environmental problems appears to be emphasizing individuals' motivation to leave a positive legacy. In a 2015 study in *Psychological Science*, Weber and colleagues Lisa Zaval (Columbia University) and Ezra M. Markowitz (University of Massachusetts Amherst) found that individual differences in legacy motivation were positively associated with proenvironmental behaviors and intentions. Moreover, when the researchers made legacy

Solar panels and wind turbines are leading sources of renewable energy.

Reducing energy use

Environmental motivations can influence energy-saving behaviors at the individual level, but most research has focused on financial motivations such as lower utility bills, according to psychological scientist Elke Weber. Weber and colleagues have found that messages conveying environmental as well as financial benefits lead to higher energy savings than messages conveying only financial benefits. It helps to align these benefits with participants' political affiliations: Climate change messages worked best for liberals, whereas stewardship/independence messages worked best for conservatives.

Weber and colleagues are now studying a range of nonfinancial motivations for energy-saving behaviors across the political spectrum and examining what motivations are most strongly linked to existing energy-saving behaviors. In a final phase of the project, they will test whether their findings translate from the lab to real-world environments. Findings from this project will help shape the messages that used to motivate behavior change and promote behavior change.

motivations salient, participants increased their donations to an environmental charity and demonstrated more proenvironmental intentions and climate change beliefs.

Importance of the social and physical environment

"Human decisions, and in particular decisions that impact sustainability and the quality of our natural environment, are made within a social and physical context," Weber has written on her website. Currently, she is researching the success of interventions aimed at changing perceptions of social norms. With participants from different countries, including the United States, Italy, China, and India, the researchers will study the longevity and cross-cultural generalizability of such interventions. "By tracking perceptions, attitudes, perceived social norms, and behavior with respect to climate change, air pollution, or other environmental hazards, we can track the sensitivity of these variables towards variations in the physical and social environment and can measure immediate and long-term effects of top-down signals hypothesized to influence behavior via changed perceptions of social norms," Weber explained.

In another study, Weber and colleagues are investigating the factors that influence perceptions of social norms. ➡

Their hope is to address coordination problems posed by global challenges such as climate change. Specifically, the researchers are examining how similar institutional signals from different sources, such as governments, business organizations, and scientific agencies, affect perceptions of social norms, individual attitudes, and behavior.

Sander van der Linden (University of Cambridge) has also emphasized the role of social norms in responses to climate change, putting forward a social-psychological model of climate change risk perceptions in a 2015 paper in the *Journal of Environmental Psychology*. By testing the climate change risk perception model (CCRPM) in a large sample of the U.K. population, van der Linden found that predictors of climate change risk perception include gender, political party, social norms, value orientations, negative affect, and personal experience with extreme weather events, along with knowledge of the causes, impacts, and responses to climate change. Moreover, he found that sociocultural and experiential factors were better predictors of perceived risk than cognitive or sociodemographic factors.

Given these results, van der Linden suggested that "risk messages are likely to be more effective when they not only provide people with increased knowledge of the causes, consequences and solutions to climate change, but also appeal to affective and experiential processing mechanisms whilst being sensitive to different sociocultural value orientations."

Overall, van der Linden's results suggest that perceptions of climate change risks are complex and multidimensional, and that risk communication might be more efficient when it appeals to multiple aspects of human judgment and behavior.

What should policymakers do to improve individuals' and communities' engagement with climate change and, ultimately, improve sustainability? In an article published in 2015 in *Perspectives on Psychological Science*, van der Linden and colleagues suggested five "best practice" insights from psychological science:

- Emphasize climate change as a present, local, and personal risk (e.g., educate the public about current local impacts of climate change).

- Facilitate more affective and experiential engagement (e.g., use affective recall, stories, and metaphors).

- Highlight relevant social group norms (e.g., the scientific consensus on human-caused climate change).

- Frame policy solutions in terms of what can be gained from immediate action (e.g., provide information about direct health gains for individuals).

- Appeal to intrinsically valued long-term environmental goals and outcomes (e.g., motivations for leaving a better world for the future). ○

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CULTIVATING CULTURES OF SUSTAINABILITY

Harnessing personalities and perspectives to create more sustainable societies

By Kim Armstrong, APS staff

Responsibility for environmental degradation and climate change can hardly be placed on the shoulders of any one person. An individual could, theoretically, do nothing but drink from disposable water bottles and eat prepackaged meals imported from around the world while basking in 24-hour, fossil-fuel-powered air conditioning—and yet have virtually no impact on the world's climate if their society as a whole was committed to green living. The same could probably be said for a zero-waste vegan living off the grid in a country dominated by throwaway consumer culture.

The impact of consumption is cumulative and systemic. Not only do the choices, diet, and energy usage of every individual consumer coalesce into a society's overall ecological impact, but that society's environmental policies and social norms dictate the boundaries of what decisions are

financially feasible and socially acceptable for for people to make. The repercussions are greatest for lower-income people, immigrants, and people from other disadvantaged groups who may lack the resources needed to prevent or recover from natural disasters, pollution, and other environmental stressors, according to psychologist and health researcher H. Shellae Versey (Fordham University).

"Climate change agendas must clearly acknowledge the cumulative risks for socially vulnerable groups," Versey explained in a 2021 paper. "Any intersectional policy on climate change must coordinate action among all stakeholders."

There is no one-size-fits-all approach to climate change, she added, but considering who is most at risk and why—whether because of housing instability, a lack of social safety nets, regional risks related to flooding and wildfires, or

experiences of racism, sexism, and other forms of bias—can help create policies that are a good fit for a given community.

"Nowhere is the phrase 'think globally, act locally' more appropriate than addressing the harms by climate change," Versey wrote.

Cultivating cultures of sustainability

To turn the tide of ecological devastation, humans must develop new cultures of sustainability, wrote APS Fellow Yoshihisa Kashima (University of Melbourne, Australia) in a 2020 paper published in *Current Directions in Psychological Science.*

Broadly speaking, culture is a dynamic process through which information is socially transmitted between individuals, and it is also the driving factor in how humans choose to go about constructing a niche in our natural environment, Kashima explained. That niche consists not only of buildings and other structures but our social networks, governments, and other institutions.

"There is hope if humanity can craft cultures of sustainability, namely, cultures that highlight and reward the ideas and practices that help reduce our environmental impact while sustaining global human well-being," wrote Kashima.

A lasting culture of sustainability, Kashima continued, needs not only to guide humans toward living within the planetary boundaries of Earth but also to make room for equitable economic development—green and otherwise.

"Ecological sustainability requires societal sustainability," Kashima explained in an interview with the *Observer.* "This is because realizing environmentally sustainable futures requires collective action understood as many people's participation in coordinated activities in this globalized society."

Kashima suggests that cultures of sustainability consist of the following four parts.

The human-nature relationship: One of the primary ways that cultures define what it means to be human is through ideas about humans' relationship with the rest of the natural world. This cultural concept can lead individuals to construct different kinds of environmental identities. Encouraging people to view themselves as a part of nature can make environmental strivings more personal, Kashima wrote, increasing individuals' willingness to conserve energy and produce less waste for the benefit of their environment.

Cultural artifacts: How we conceive of human-made objects can also influence our consumption choices. The system of mass production common in industrialized countries today, Kashima noted, contributes to the construction of a linear economy in which resources are taken from nature, used by humans, and disposed of somewhere out of sight,

where unseen waste continues to influence the natural world. A cultural shift toward the reuse and recycling of resources could support the evolution of a more circular economy, in which artifacts are used longer and repurposed in a cyclical fashion to minimize waste and environmental impact.

Norm talks: Social norms convey the social costs and benefits of behaviors. Shifts in norms are thus one way in which small communities can overcome the infamous "tragedy of the commons" even in the absence of government regulation, Kashima wrote: Norms can serve as a powerful reminder of the need to contribute to the greater good at the local level. Emphasizing the dynamic nature of norms in our conversations about environmental impact can also encourage individuals to adopt new behaviors that may one day become common.

A vision of utopia: These cultural components can be united through a common vision for the future, Kashima added—either in the form of an ideology, which seeks to preserve the status quo, or that of a utopia, which offers a glimpse of a better world. Imagining a green utopia can not only reduce people's tendency to justify the current system but increase their willingness to engage with environmental policy and to believe that their engagement could make a meaningful difference.

In practical terms, these steps could take the form of performing "green talks" at the community level, writing to politicians, donating, or even engaging in pro-environmental protests, Kashima wrote, all of which encourage individuals and institutions to adopt more sustainable practices.

"I hope that the persistent groundswell of global civil society will enable and encourage institutional changes at the national and international levels," Kashima said. "After all, those who make policies and policy decisions are also participants in this global civil society and of cultural dynamics for our common future."

Belonging, wherever you are

All of the cultural components outlined above exist to varying degrees in cultures across the world, but the path to constructing a more sustainable society won't look the same everywhere.

"My research would suggest the importance of adopting a cultural perspective if we want to make pro-environmental policies or pro-environmental campaigns effective in different places," said APS Rising Star Liman Man Wai Li (The Education University of Hong Kong), who studies psychosocial health, in an interview with the *Observer.*

Eastern and Western cultures are often described in terms of interdependence and independence, respectively, with those in the former group more likely to perceive

themselves as interconnected with others and those in the latter group more likely to perceive themselves as autonomous. Individuals within cultures can differ significantly in this respect, of course, but everybody needs to find a way to fulfill their basic needs—including the need to belong.

Some people with more independent self-concepts, however, can satisfy this need for connection even without a human "other," a preference that may influence the sustainability of their behavior.

In a 2021 study of 206 Americans and 959 Singaporeans, Li and colleagues Mengru Liu (National University of Singapore) and Kenichi Ito (Nanyang Technological University, Singapore) found that people with more independent self-concepts who felt close to nature also reported a reduced need to belong. Independent-minded people who did not feel close to nature and people with more interdependent self-concepts did not demonstrate this relationship.

These findings support the idea that connecting with pets, places, and nature itself could at least partially fulfill the need to belong among more independent people, Li and colleagues wrote. Nature relatedness has also been linked with making more sustainable consumer choices.

"Strengthening the connection between humans and nature could help promote more individuals' pro-environmental behaviors," Li said in the interview.

Crafting cross-cultural education

Another dynamic that may influence perceptions of nature, as well as the consequences of climate change, is the extent to which individuals engage in dialectical or linear thinking.

Dialectical thinking arises from the belief that the universe is constantly changing, resulting in a tolerance of contradictions and a tendency toward holism—the sense that seemingly separate elements of the world are in fact interconnected. Linear thinking focuses more on analyzing the direct causal relationships between events.

Dialectical beliefs form the basis of belief systems like Buddhism and Daoism, and so tend to be more common in East Asian cultures, whereas linear thinking tends to be more common in North America and Europe, Li and Ito wrote in a 2019 study. Within any culture, however, individuals will exhibit dialectical and linear thinking to differing degrees.

In that study, which involved a mix of Eastern and Western participants, Li and Ito found that more holistic thinkers reported a greater affinity for nature, as well as a greater awareness of the risks posed by pollution, which in turn correlated with a stronger commitment to pro-environmental action.

In 2021, however, Li, Ito, and colleagues Dongmei Mei (Guizhou Normal University, China) and Wen-Qiao Li (Hokkaido University, Japan) conducted a study ➡

Dialectical and Linear Beliefs

Dialectical beliefs reflect our perception of how different elements of the universe, including humans and other parts of the natural world, interact with one another. As outlined in Liman Man Wai Li's research:

Dialectical thinkers tend to believe that the universe is constantly changing, resulting in a tolerance of contradictions and the perception, known as holism, that seemingly separate elements of the world are in fact interconnected.

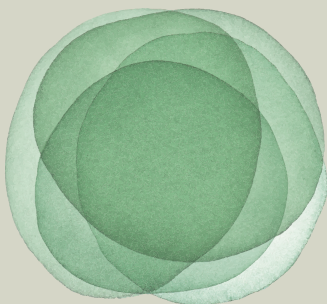Linear thinkers tend to focus more on analyzing the direct causal relationships between events, resulting in the perception that there is only one truth and elements of the universe act independently.

of 83 Chinese and 76 American participants. They found that dialectical thinkers were more likely to predict that climate change would moderate itself over time, whereas linear thinkers more often predicted that temperatures would continue to rise.

"Dialectical thinkers tend to show greater pro-environmental commitment but are less likely to predict an increasing trend of climate change, although the majority of participants perceived a rising trend of climate change regardless of cultures and manipulation conditions," Li explained.

These and other findings suggest the importance of adopting a cultural perspective when designing climate change education programs. For example, Li explained, dialectical thinkers tend to be less decisive when making trivial decisions about the environment, but this tendency can be counteracted by emphasizing the importance of generating solutions to these issues.

"Although the proper knowledge of climate change can be acquired through climate change education... the effectiveness of global climate change education programs may be rather limited if we ignore the potential negative influence of cultural factors that substantially shape people's habitual thinking," Li and colleagues concluded.

Patterns of personality

Although reorienting our cultures toward sustainability could alter the trajectory of our societies, not every citizen responds to a given culture in the same way. Looking at environmental advocacy through the lens of personality psychology could help environmental advocates reach new populations.

"An individual's impact on the environment typically involves a variety of behaviors enacted across a wide range of situations and repeated over extended periods of time," wrote Alistair Raymond Bryce Soutter, Timothy C. Bates, and René Mõttus (University of Edinburgh, Scotland) in a 2020 article published in *Perspectives on Psychological Science*. "This patterning of behavior is what personality research examines. Less commonly, but perhaps of equal importance, the personality traits and associated attitudes of a few powerful individuals may have substantial and lasting effects on climate policies."

Soutter and colleagues examined this relationship through a meta-analysis of 38 studies of how the Big Five and HEXACO measures of personality relate to people's environmental attitudes and behaviors. The more commonly used Big Five personality inventory conceptualizes personality as an amalgamation of five traits—extraversion, agreeableness, openness, conscientiousness, and neuroticism—whereas the HEXACO personality inventory adds a sixth dimension: honesty-humility, a measure of an individual's tendency to cooperate with or exploit others.

These studies collected data from 44,993 individuals in 18 countries (Australia, Belgium, Canada, China, Germany, Greece, India, Japan, Lithuania, Malaysia, New Zealand,

Trait	Associated with...	Alternative messaging
Agreeableness	Empathy and compassion, which may extend to the natural world.	People low in agreeableness may be less likely to trust interventions and could respond more to promoting the personal financial and health benefits of green behaviors.
Openness	Willingness to consider new ideas and learn new behaviors.	People low in openness tend to be less willing to adopt new ideas and may respond better to framing green behaviors as popular and established.
Conscientiousness	Long-term thinking, although people high in this trait are also likely to be wealthier, and thus consume more resources.	People low in conscientiousness may plan less and could benefit from making green behaviors easier to carry out.
Honesty-humility	Avoiding the exploitation of other humans, animals, or the natural environment.	People low in honesty-humility may respond better to promoting the personal benefits of green behavior over moral arguments.

Although people with certain personality traits may be more inclined toward proenvironmental attitudes and behaviors, research by Alistair Raymond Bryce Soutter and colleagues suggests that alternative messaging could help persuade people low in these traits to make greener choices.

Romania, Russia, South Korea, Sweden, Taiwan, Turkey, and the United Kingdom). Taken together, they revealed that individuals who scored higher on openness, honesty-humility, agreeableness, and conscientiousness were more likely to adopt pro-environmental attitudes and behavior.

Although the effect sizes for these associations were small, Soutter and colleagues noted, they were on par with the effect size for the association between intelligence and academic performance, which are generally accepted to be linked.

Targeting less persuadable personalities

These traits could translate into pro-environmentalism in several ways, the researchers noted. People high in openness are generally more willing to consider new ideas and learn new behaviors, and those high in honesty-humility are often less willing to exploit other humans, animals, or the natural environment. Agreeableness is associated with empathy and compassion—which in this case might extend to empathy for nature or future generations who will have to live with the environmental consequences of current behaviors—and conscientiousness has been associated with delaying gratification and other long-term thinking.

However, possessing high levels of these traits isn't a guarantee that a person is looking to go green, Soutter and colleagues added.

Conscientiousness in particular, the researchers wrote, has also been linked with closely following social norms, but many behaviors that signal high social status, such as traveling abroad or owning a large home, aren't necessarily compatible with a sustainable lifestyle. High conscientiousness is also associated with wealth, and despite the common refrain that environmental degradation is somehow linked to overpopulation, a minority of wealthy people and nations consume most of the world's resources and generate the vast majority of carbon emissions and other pollution.

These findings could be translated into change on both the personal and political front in a number of ways, Soutter and colleagues wrote. Instead of "preaching to the choir" of other environmentalists, advocates could target people low in openness—for example, by framing green behaviors as popular and established rather than novel. People low in conscientiousness, on the other hand, might benefit more from practical strategies for sticking with green behaviors than philosophical arguments for doing so.

People low in honesty-humility and agreeableness might also be less swayed by the standard moral arguments around environmentalism. Instead, Soutter said in an interview with the *Observer*, messaging might highlight the personal benefits of green behaviors—for example, how using renewable energy can result in cheaper power sources and reduce the health effects of pollution.

"Simply speaking, why target environmentalists to act environmentally when it's non-environmentalists who need the convincing?" Soutter asked. "Someone whose personality orientates them to be more environmental is already likely to be participating in environmental behaviors. In contrast, more energy, and, as we suggested, more targeted interventions are needed for those who naturally (personality-wise) would not be inclined to act environmentally."

Focusing on the personal benefits of green behaviors could also help spur change among less environmentally inclined people whose perspectives are tied, at least in part, to external factors such as socioeconomic conditions, urbanization, and household size.

"Even if these attitudes and behaviors can, to a substantial degree, be explained by personality traits, this does not mean that they are immutable," Soutter wrote. ●

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GROWING PLACES

Science examines how physical surroundings affect children's development

By Scott Sleek

Clad in rain jackets and rubber boots, the preschoolers frolic along the muddy trails of Vashon Island in Puget Sound, reciting the alphabet as they wade through puddles and climb trees. They are students of the Cedarsong Nature School, co-founded by the late naturalist and educator Erin Kenny.

The scene is depicted in a YouTube video Cedarsong released in 2018, a few months before cancer took Kenny's life. An advocate for outdoor learning, Kenny believed that kids learn spontaneously through walks in nature. Her motto for the school was: "Children cannot bounce off the walls if we take away the walls."

Science backs up Kenny's philosophy. Numerous findings point to trees, brooks, and fields as fuel for children's intelligence and mental health. But while some children can easily enjoy a day in the park, if not an all-outdoor school, others live in crowded housing and neighborhoods beset by poverty and neglect. While some attend school on bucolic campuses, others struggle to learn in packed, noisy classrooms.

Those surroundings have profound effects on children's cognition and emotions, but social science has largely overlooked those factors, says APS Fellow Gary W. Evans, who studies developmental and environmental psychology at Cornell University.

"In psychology, 'environment' usually refers to social conditions, ignoring the physical properties of the settings and objects people interact with," Evans, a 2013 Guggen-

heim Fellow, wrote in a recent article for *Current Directions in Psychological Science*. "One consequence is a relatively underdeveloped understanding of how properties of physical surroundings and objects contribute to child development."

Research examining the effects of physical settings on children has historically suffered from methodological shortcomings, Evans wrote. But increasing scientific rigor has produced solid evidence of the influence that setting and atmosphere have on children's learning and behavior.

Living in chaos

Research on children and their material environment emanates from APS James McKeen Cattell Fellow Urie Bronfenbrenner's classic ecological systems theory, which called attention to the interaction between the individual and the environment. Bronfenbrenner's model spurred Evans and other scientists to explore the impact of household chaos on children. He and other social scientists have characterized chaos as noise, crowding, disorder, and instability.

Many studies on the effects of environmental mayhem utilize the Confusion, Hubbub, and Order Scale (CHAOS) developed by APS Fellow Adam P. Matheny (University of Louisville), Theodore D. Wachs, Jennifer L. Ludwig (Purdue University), and Kay Phillips (University of Louisville). The scale assesses perceptions of routine, noise, and general confusion in the home. Participants rate their level of agreement with statements such as "You can't hear yourself think in our home" and "We can find things when we need them." Longitudinal studies employing CHAOS have linked chaotic homes with behavior and attention problems (Doan & Evans, 2020).

A 2009 study involving more than 300 families with same-sex twins stands as an example. A team of psychological researchers led by APS Fellow Kirby Deater-Deckard (University of Massachusetts Amherst) had parents complete a short version of CHAOS and assessed the families and households on a variety of factors, including household conditions such as dirt and clutter. They found lower IQs and heightened conduct problems among children living in chaotic households.

Loud and unclear

The most extensive studies combining environmental and developmental psychology date back 50 years and focused on the effects of ambient noise in the spaces that children occupy. Among them was environmental psychologist Arline L. Bronzaft's famous 1975 study at a New York City elementary school near an elevated train track. She found that train noise penetrated one side of the school, where students had lower standardized test scores compared with their peers in classrooms on the quieter side of the building. The train noise was so loud the teachers had to stop talking, resulting in a 10% reduction in teaching time. After the school installed substantial sound buffers, those differences in student performance disappeared.

Evans and colleagues Monika Bullinger (University of Hamburg) and Staffan Hygge (University of Gävle, Sweden) have demonstrated the effects of noise on children's cognition, as well as their stress levels. Their work began in the 1990s in Munich, where one international airport closed down and a new one opened at a different location. They tested children living near both sites at different times and found that children exposed to aircraft noise showed cognitive deficits and elevated stress biomarkers. They also found that children living near the old airport showed cognitive improvements after it closed.

It takes far less than the roar of a train or aircraft to affect children's attention and learning. In a study published in 2018, researchers Bo Zhang and Regina Navejar (University of Wisconsin, Milwaukee) tracked 22 teenagers' reactions to typical background noise in their urban high school. In more than 250 tests over 2 days, the researchers measured the average noise level in the schools to be double to triple the recommended limit for classes. Forty percent of the students reported being disturbed by noises ranging from slamming doors to hallway chatter. And the more
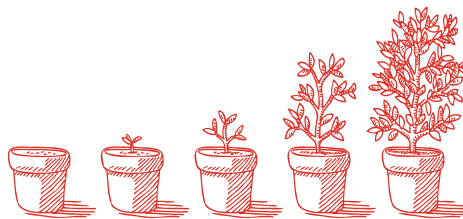
students reported being bothered by the noise, the lower their scores on math tests. Other studies have linked chronic noise to reading deficits.

"If you were to ask most public health researchers about noise, they're going to talk about hearing loss," Evans said in an interview with the *Observer*. "That's important, but the level of noise it takes to produce hearing damage is so much greater than the level it takes to produce reading deficits."

Visual mayhem

Low-income families who struggle to find safe, stable, and affordable housing face their own forms of home chaos. Rebekah Levine Coley, a professor of developmental and educational psychology at Boston College, documented the toll that housing instability takes on kids by tapping into a longitudinal sample of children, adolescents, and young adults from low-income neighborhoods in Boston, Chicago, and San Antonio. She and her colleagues found that children who grow up in homes with vermin, leaking roofs, broken windows, and other forms of disrepair experience heightened emotional and behavioral problems beginning at young ages and lower reading and math skills in adolescence (Coley et al., 2013).

Visual clutter has an impact well beyond the home and doesn't have to take the form of blight. Psychological researchers at Carnegie Mellon University found that children in highly decorated classrooms became more distracted and showed smaller learning gains compared with those in an unadorned classroom setting. For the study, 24 kindergarten students were placed in laboratory classrooms for six introductory science lessons. Three lessons were taught in a classroom adorned with lots of posters, maps, and artwork, and three lessons were given in a sparsely decorated room. The results showed that although children learned in both

Numerous studies have linked green space with lower levels of behavioral problems and attention deficits in children, even controlling for a variety of demographic, socioeconomic, and environmental factors.

classroom types, they learned more—and better stayed on task—when the room lacked extensive décor (Fisher et al., 2014).

The effects of other physical elements, such as neighborhood conditions, leisure spaces, and weather, have received less attention in psychological research, Evans said. But evidence suggests that urban environments are harsh on some children. An international team of scientists that included APS Fellows Avshalom Caspi and Terrie E. Moffit (Duke University) tapped the Environmental Risk (E-Risk) Longitudinal Twin Study, which tracked more than 2,200 twins in the United Kingdom from birth to age 12. They assessed children's psychological state at age 12 through in-home interviews. They also collected data from residential surveys, government records, and satellite images, examining such factors as crime, neighborhood cohesion, and disorder in the form of graffiti, vandalism, and noise. As reported in a 2016 article, the researchers found that 7.4% of children in urban neighborhoods had experienced at least one psychotic symptom by age 12—nearly twice the prevalence found among children in suburban and rural areas. The results held when the scientists controlled for socioeconomic status and family psychiatric history (Newbury et al., 2016).

The forces of nature

Numerous studies have linked green space with lower levels of behavioral problems and attention deficits in children. A 2016 multidisciplinary study measured levels of aggression in a cohort of 1,287 twins and triplets ages 9 to 18 in Southern California. The researchers employed satellite imagery to measure neighborhood green space such as parks, gardens, and tree-lined streets. They discovered that children living near green space showed reduced aggressive behavior. Those findings held even when the authors controlled for a variety of demographic, socioeconomic, and environmental factors (Young et al., 2016).

Public health analyses have also indicated that children living in greener urban environments have higher IQ scores than their peers who lack exposure to nature. In Spain, a

team of 19 scientists from the fields of psychology, medicine, and epidemiology incorporated satellite images into their longitudinal research and found that children residing in homes with more surrounding green space scored better on computerized attention tests at ages 4, 5, and 7 (Dadvand et al., 2019). And a recently published meta-analysis found that spending time in nature boosts children's academic achievement (Kuo et al., 2019). The multidisciplinary research team, which included neuropsychologist Catherine Jordan of the University of Minnesota, found that nature improves attention, relieves stress, bolsters self-discipline and motivation, and fosters cooperation among students.

Exposure to nature appears to have lasting effects. Numerous studies have shown that environmentally responsible adults had a history of spending substantial time in nature as children.

Overall, psychological science is building a strong case for addressing the physical environment in policies and interventions developed for children at risk for psychological problems. Those interventions need to be comprehensive, given that home and school conditions affect adults as well as the children they care for. One reason that children in noisy neighborhoods show language deficits, after all, is because it's simply difficult for them to hear their parents talk.

"The primary intervention for dealing with poverty and environmental issues in the U.S. has been individually based—for example, parenting," Evans said. "What I'm struck by is that usually ignores the fact that the parent is in the same environment as well." ●

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HOME IMPROVEMENT

Lessons about living—our spaces, and our behaviors in them—from our year with ourselves at home

By Leah Thayer, APS staff

Work came home, quite literally, for thousands of psychological scientists at the beginning of the COVID-19 pandemic in early 2020. For Lindsay T. Graham, a psychometrician and personality and social psychologist who studies the fit between humans and their daily environments, the lens through which she conducts her research quickly became personal.

Graham is a research specialist at the Center for the Built Environment at the University of California, Berkeley. Her work explores how people select, manipulate, and use their spaces to best fit their lives and daily needs, and she has a particular interest in how human behaviors and personality influence indoor air quality. Consciously or not, she noted in an interview with the *Observer*, we often

make trade-offs between our physical and mental health when it comes to our living spaces.

"For instance, having a candle in your space is a really a poor choice from an indoor air quality standpoint, but it can also provide mental comfort, relaxation, rejuvenation, or coziness," she said. In another example gaining growing scrutiny amid the climate crisis, gas stoves—preferred by many home chefs for their blue flames and versatility—produce far more pollutants than electric ranges.

Last March, after the virus's aggressive spread forced Graham to relocate her work from the campus office she shared with colleagues to the one-bedroom apartment she shared with two cats, "it just got really rough," she recalled. "I was in Berkeley from March to October al-

most in complete isolation," other than seeing colleagues on video calls and online chats. Daily walks in the Bay Area's famously pristine air and temperate weather helped to mitigate the sense of disconnection, but the start of a horrendous wildfire season in September made the air so smoky that it became unsafe even to open her windows for ventilation, let alone take long walks.

So Graham made some calculated trade-offs of her own, including, in October, moving herself and her cats 2,400 miles to Columbus, Ohio, where she now lives with her best friends and their daughter. "It's a much better psychological situation," she said, "but it also feels really weird to have just dropped everything and uprooted." Yet she is grateful to be able to work remotely, and she recognizes that her temporary home and office space has been in many ways an ideal laboratory for her work in these unusual times.

"I think our home environments are so important," she said. "They have the potential to impact us in such positive or not so positive ways," especially in periods of prolonged stress. She wrote about this in *Perspectives on Psychological Science* in 2015, in fact, noting how our built environments can be manipulated to affect our cognitive and emotional states, influence our activities, or even "fend off feelings of isolation and loneliness."

Researchers will spend years exploring the psychological implications of the pandemic, but new findings are already revealing insights on matters ranging from how an absence of face-to-face contact affects the brain to the impact of our immediate surroundings. To the latter focus, Graham proposes a deeper exploration of how people feel when they're in certain spaces, along with what might influence those feelings. "What could I do to amplify those feelings when they're positive or shift them when they're not?" she said.

"The truth is, there just isn't a lot of empirical work investigating the answers," she said. "But there is evidence connecting our emotions to certain spaces, which can validate architectural intentions as a practice." For example, citing findings from the *Perspectives* paper, she noted that "we know people may want to experience restoration or intimacy in their bedroom space. We also know, from unpublished research, that people tend to associate flowers, candles, wood flooring with intimacy, and plush carpeting, pillows, and lots of blankets with restoration in bedroom spaces."

Home alone

Lockdowns, shutdowns, quarantines—by whatever term, and whether due to government dictate or personal choice, it's been some 16 months since the start of what *Nature* memorably described as the "the largest social isolation

As in previous viral epidemics, feelings of both isolation and suicidal thinking increased during the onset of the COVID-19 pandemic, according to new research in *Clinical Psychological Science.*

experiment in history." To this day, millions of people remain isolated in their homes, quite often alone. Some were physically and emotionally vulnerable even before the pandemic; many others experienced isolation for the first time.

The full emotional impact didn't hit overnight, however. In the early weeks of the stay-at-home orders, which began in China and then spread from Albania to Zimbabwe, there were shows of solidarity and national unity. Italians took to their balconies to sing patriotic songs and applaud frontline medical staff. As the weeks turned to months and infection rates rose, moods darkened. In the United Kingdom, by late April, 27% of adults and 42% of those living alone reported feeling lonely, according to research published in *PLOS ONE* (Groarke et al., 2020). By the end of the year in Japan, suicide rates among women had surged by 15% and nearly doubled among those in their 40s.

These consequences should not have come as a surprise, given the lessons of history. "Previous viral epidemics have been associated with increasing rates of suicidal thoughts and behaviors," wrote Rebecca Fortgang (Harvard University) and colleagues in a new article in *Clinical Psychological Science*. "Suicide deaths increased during and following the Great Influenza Epidemic of 1918 in the United States and the severe acute respiratory syndrome (SARS) outbreak in Hong Kong among elderly individuals. Furthermore, social distancing to curb the spread of coronavirus may increase social isolation, a well-established risk factor for suicide." Indeed, their new research, involving 55 people with a history of suicidal thinking or suicide attempts, found that both feelings of isolation and suicidal thinking "increased significantly" among adults during the onset of the pandemic.

Previous psychological research has also tied isolation to other detrimental outcomes. Perhaps most famous is the work of Harry Harlow. "Human social isolation is recognized as a problem of vast importance," wrote Harlow and colleagues in 1965. In their empirical

COVID-19 and Social Isolation

Last spring, APS launched a series of backgrounders to explore many of the psychological factors associated with COVID-19. In a backgrounder on social isolation and adults, Chris Segrin of the University of Arizona said, "The stress of loneliness degrades mental and physical health (e.g., cardiovascular fitness, immune fitness) through disruption of recuperative behaviors (e.g., sleep, leisure) and corruption of health behaviors (e.g., substance use, diet, exercise)." A backgrounder on the social impact on children, in turn, cited several studies showing that physical comfort is important in reducing children's distress.

See the COVID-19 Backgrounder series at psychologicalscience.org/news/backgrounders.

work exploring the impact of contact comfort on primate development, the cognitive psychologists used methods of isolation and maternal deprivation on infant rhesus monkeys who, when re-introduced to others, "were unsure of how to interact—many stayed separate from the group, and some even died after refusing to eat."

Extensive research on isolation and loneliness followed, including a 2015 meta-analysis by APS Fellow Julianne Holt-Lunstad and colleagues that showed the heightened risk of mortality associated with loneliness to be comparable to that of smoking 15 cigarettes a day or being an alcoholic, and greater than the health risks associated with obesity. "The current status of research on the risks of loneliness and social isolation is similar to that of research on obesity 3 decades ago—although further research on causal pathways is needed, researchers now know both the level of risk and the social trends suggestive of even greater risk in the future," Holt-Lunstad and colleagues wrote in *Perspectives on Psychological Science*.

In the intervening years, a convergence of social and lifestyle trends has made these risks more salient. People live alone to an unprecedented degree, especially in affluent regions. One-person households accounted for 33% of households in the European Union in 2018 and more than half of households in London and Stockholm, according to Our World in Data. In the United States, the share of one-person households more than doubled between 1960 and 2020, from 13% to 28%. Rapid growth is "largely due to increases in the share of older adults living alone,

More about the PsyCorona project: psychologicalscience. org/observer/psycorona-covid-19**.**

particularly women," wrote Alicia VanOrman and Linda A. Jacobsen for the Population Reference Bureau. "The share of women ages 65 and older who lived alone rose from 23% in 1960 to 37% in 1980."

Solitude and resilience

But although age is a risk factor for both isolation and severe health complications due to COVID-19, other variables, including the ability to simply leave one's home and have occasional face-to-face contact with others, may play a greater role in managing emotional health during periods of physical isolation.

Consider preliminary findings from PsyCorona, a global project investigating the psychological and behavioral responses to COVID-19 with more than 60,000 participants. Data collected since last July have made it "very clear that there are two different groups of individuals: those who are doing well, and those who are not doing so well," said Marieke van Vugt, a neuroscientist at the University of Groningen and a project collaborator. The group doing well, she clarified in an interview, has reported being less lonely, anxious, bored, depressed, and exhausted and more calm, inspired, and relaxed. One relevant variable "is how often they leave the house. The people who are doing well tend to go out a bit more than the others." Interestingly, she added, "this group leaves the house mostly for work and errands, whereas when the group that is not doing well leaves the house, they do it predominantly for leisure with others."

Why *is* social contact, even with strangers, so important to well-being? Paul van Lange and Simon Columbus (University of Copenhagen, Denmark) explored this very question in an upcoming article in *Current Directions in Psychological Science*. "In most situations involving low conflict of interest, people are naturally kind—even in the absence of any history or future of social interaction," van Lange and Columbus wrote. They cited studies showing the strength of weak ties, or people beyond one's close network, in which even a greeting, smile, or brief conversation—a single encounter, such as with a bus driver or a barista—can boost people's happiness.

When opportunities for face-to-face contact are scarce, as they've been during the pandemic for many, emotional resilience proves another advantage. This helps explain why older people, on average, have done better—at least from an emotional perspective—than younger people.

For example, a study published last fall in *Psychological Science* assessed the positive and negative emotional experiences of 18- to 76-year-old American adults during the month of April, when COVID-related deaths increased from roughly 5,000 to 60,000. The moods of older people

Grieving at Home

Sorting through a loved one's belongings after their death can be heart-wrenching under any circumstances, but it is often especially painful for those left living in their home, as has been the case for many over the past year. It's not uncommon for survivors to leave the decedent's bedroom intact, just as it was the last time they slept there and, perhaps, woke up for what appeared to be just another day.

APS Fellow Dorothy P. Holinger, a staff psychologist at Beth Israel Deaconess Medical Center at Harvard Medical School, explored this topic in *The Anatomy of Grief*, published in 2020. A patient, Mrs. Hamilton, had lost her 13-year-old son, Nick, in an accident. Afterward, she essentially closed off his bedroom for months, leaving it unchanged except for his recovered backpack, "which she'd placed on the floor next to the desk where her son usually dropped it." Sometimes, when she was alone, she entered the room and looked at her son's things. "Like the toy soldiers loved and left by 'Little Boy Blue' in Eugene Field's poem, Mrs. Hamilton knew how much the archery books in his bookcase had meant to Nick, and now to her" (Holinger, 2020, p. 188).

In an email exchange with the *Observer*, Holinger clarified that her book was based in part on patient narratives and was written before the pandemic. She also noted that physical reminders of a loved one can, in some cases, compound grief.

"Grief is different for everybody because so many factors contribute to the grieving process," Holinger said. Mrs. Hamilton, she noted, was experiencing complicated grief—one of the least common forms of grief, and the most relentless, "because its intensity doesn't diminish. Thoughts of the loved one keep intruding, and for some, for a while, the bereaved can't take clothes out of a closet, or change the furniture in the room, especially if it's a child who died." In short, "the bereaved keeps returning to reminders of the loved one because they can't accept the loved one's death," Holinger explained, citing findings from a study of women with complicated grief showing that these reminders can activate a part of the brain's reward system.

What can help the bereaved when it comes to a loved one's belongings? For those unable to move them, "seeing the objects—especially in the beginning—can be comforting," Holinger said. But "as weeks and months go by, sorting through photos, clothing, and other mementos begins the process of healing" and the transformation of sadness into loving memories.

remained elevated, on average, compared with those of younger people despite both groups reporting the same levels of stress. "The unique circumstances of the pandemic allowed us to address an important theoretical issue about emotional aging," wrote APS Fellow Laura L. Carstensen (Stanford University) and colleagues. "Namely, do relative age advantages in emotional experience persist when people are exposed to prolonged and inescapable threats? The present findings suggest that they do."

Can online contact compensate for an absence of face-to-face contact? Not fully, research suggests. In preliminary research exploring lockdowns and loneliness, another group of PsyCorona researchers found that people who were already lonely were also likely to have fewer online contacts during lockdown, which exacerbated their loneliness as the weeks wore on. People with more online contacts, in turn, were also likely to have more face-to-face contacts. "Thus, it seems that the pursuit of social connectedness can translate to behavior that—from an epidemiological perspective—constitutes risk behavior, namely more frequent face-to-face contact during lockdown" (van Breen et al., 2020).

This may help to explain why adolescents, whose social and educational lives alike have shifted almost entirely online during the pandemic, have struggled emotionally. In an article accepted for publication in *Clinical Psychological Science*, Alexandra M. Rodman (Harvard University) and colleagues explored adolescents' heightened risk for anxiety and depression, particularly following exposure to stressful life events. "[E]ven daily hassles and normative stressors (e.g., peer conflict, the breakup of a romantic relationship) are associated with subsequent increases in anxiety and depression symptoms in adolescents," they wrote. Moreover, "a lack of social support is associated with elevated risk for many negative outcomes, including anxiety and depression."

Physical surroundings

As this article goes to press, numerous trends point to life's inevitable return to "normal." Tens of millions of people have been vaccinated against COVID-19, inching us closer to global herd immunity. Schools and businesses are reopening. But vestiges of the pandemic are likely to remain, including the shift—at least in some hybrid fashion among many employers—to remote work. "With us spending more time in our home spaces than we ever have before, I think this is our opportunity to really think about how the features of our home affect us," said Graham.

She planted these seeds in 2015, when she was a PhD candidate at the University of Texas at Austin. "Homes are important: People devote much of their thought, time, and resources to selecting, modifying, and decorating their living spaces, and they may be devastated when their homes must be sold or are destroyed," wrote Graham, along with

Physical Isolation Through a Clinical Lens

An upcoming special issue of *Clinical Psychological Science* will include several articles examining the emotional impact of physical isolation during the COVID-19 pandemic. Topics to be explored include:

- the levels of different types of anxiety among adolescents soon after the stay-at-home orders, after gradual reopening began, and after reopening occurred;

- the effect of quarantines due to COVID-19 on maternal depression, parental stress, and parental practices; and

- how the loneliness associated with social distancing has shaped our experience of time.

The special issue will be published later this year. For updates, visit psychologicalscience.org/publications/clinical.

APS Fellow Samuel D. Gosling (University of Texas at Austin) and Christopher K. Travis (Sentient Architecture). "Yet the empirical psychological literature says virtually nothing about the roles that homes might play in people's lives. We argue that homes provide an informative context for a wide variety of studies examining how social, developmental, cognitive, and other psychological processes play out in a consequential real-world setting."

Regardless of whether its occupants are alone, what physical details within a space—from its layout and décor to ambient features such as lighting, noise, colors, and temperature—can help to cultivate positive emotions?

Seminal work in the health care space, for instance, has explored how views of nature can speed healing and promote improved patient outcomes, Graham said. "There's also interesting work looking at how views impact our cognition and emotion in workspaces, and how this can impact our tolerance for other kinds of environmental factors and characteristics," she added. As an example, she cited research led by her colleague Won Hee Ko, a PhD candidate at the University of California, Berkeley. In assessing the impact of a window on thermal comfort, emotion, and cognitive performance, Ko and colleagues found that participants in spaces with windows were more likely to be thermally
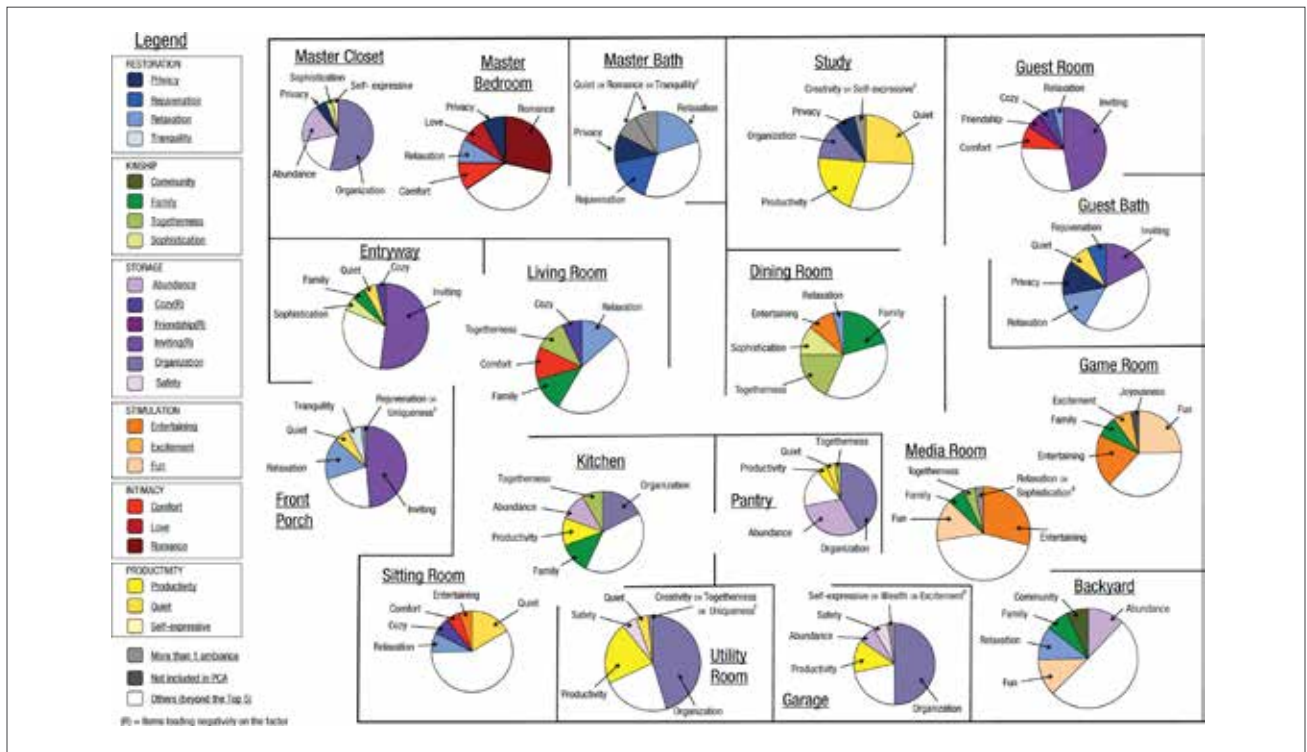
For research published in *Perspectives on Psychological Science* in 2015, Graham et al. asked participants to indicate "the most important emotions or perceptions" (out of 29 options) they wanted to evoke in 18 rooms or spaces of an "ideal home." The pie charts map out the top five ambiances selected for each space.

comfortable, experience more positive emotions and fewer negative emotions, and have greater working memory and ability to concentrate than participants in spaces without windows.

"Considering the multiple effects of window access, providing a window with a view in a workplace is important for the comfort, emotion, and working memory and concentration of occupants," the researchers wrote. Moreover, window views could even lead to energy savings: The findings suggest "that people close to windows are more forgiving of small thermal comfort deviations."

Aspects of people's physical features might provide clues to what types of places (or what design features in their personal spaces) best suit their personalities. In another project, Graham and colleagues used reviewers' profile photos to predict ambiance ratings of restaurants and cafes on social-networking sites. Using 129 image elements involving image aesthetics, colors, emotions, demographics, and self-presentation, they proposed potential applications, including the sites' recommendations to users based on their assumed ambiance preferences (Redi et al., 2015).

What about ambiance in the ideal home? In a 2012 experiment with a residential architectural firm, Graham and colleagues explored this as well, developing a questionnaire for people who were in the process of designing new homes for themselves (Graham et al, 2015). The questionnaire asked clients to consider their ideal home in the context of 18 rooms or other spaces. For each space, they were asked to ascribe a few emotional goals they wanted to feel while in it, choosing from a drop-down list of "ambiances" that ranged from abundance, comfort, or community to tranquility, uniqueness, or wealth.

There are no ideal "one-size-fits-all" takeaways from any of this research, of course, and maybe that's "the beauty of our relationships with space," Graham said. "Every individual has different experiences with their spaces. At the base of it all, our homes are environments that should provide safety and security. They should be what we need them to be so that we can be who we need to be."

If there's anything that has especially resonated from her pandemic experience, she added, it's that "our space is a tool. It allows us to express ourselves, to manage our emotions, to do work, to build community, whatever. But the human pieces—the social interactions that happen within a space—are just as valuable as the space itself." ●

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UP-AND-COMING VOICES: THE ENVIRONMENT AND BEHAVIORAL HEALTH

Poster presentations offer student and early-career researchers an invaluable opportunity to connect with colleagues and present their work to the broader scientific community. With many such events still taking place online, this *Observer* feature provides early-career psychological scientists who participated in the 2020 APS Virtual Poster Showcase with another platform to share their research. This edition spotlights a selection of research related to environment and behavioral health. The 2021 APS Virtual Convention is May 26 and 27: psychologicalscience.org/conventions/2021-virtual.

The Action-Attitude Gap in Sustainability: Connectedness to Nature Helps Mediate the Difference

Jenna Tipaldo, **Naseem Dillman-Hasso**, *Natalia Piskorski, and Mindy Engle-Friedman (CUNY-Baruch College)*

What drew you to this research?

Over the past few decades, but especially in the past few years, it has become increasingly apparent that research on the environment and the climate crisis is urgent and time-sensitive. While plenty of research exists in other spheres revolving around the gap between values and actions—such as in consumer behavior, economics, and health research—we wanted to apply this theory to environmental research in an attempt to understand how to bridge the gap between climate change beliefs and actions.

Individual behavior changes alone are not sufficient to stop climate change, as evidenced by the relatively small drop in greenhouse gas emissions even with drastic behavior changes during COVID-19 lockdowns, but individual choices still play an important role in reducing greenhouse gas emissions. As noted by the Intergovernmental Panel on Climate Change, when it comes to limiting the worst impacts of climate change, even a half-degree less of warming (1.5 rather than 2.0 degrees Celsius) can greatly reduce the severity of climate impacts. Together, the actions of many can make a difference, and through shifts in culture and market demands, individual actions can augment and even facilitate the large-scale systemic changes that are needed to reach zero emissions. Through this project, we hoped to gain insight that could help inform interventions to promote individual sustainable behaviors.

Bold type indicates authors of response

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

Coming into this line of research, we expected that an individual's locus of control would explain some of the variance in sustainable behavior. However, we were

surprised to find that a person's perceived control over the world had no impact; rather, there was a weak positive correlation between connectedness to nature and the frequency of performing sustainable behaviors. While this was not what we first hypothesized, the data did make sense—individuals who felt more emotionally connected to the natural environment may have participated in more pro-environmental behaviors because they wanted to protect the natural spaces important to them. These results help point toward strategies for more effective interventions to encourage sustainable behaviors.

The Greener, the Better:
A Company's Environmental Performance Influences Affective Commitment

Isabelle Campeau-Hunziker, *Christina Andreea Popsecu, and Kaspar Schattke (Université du Québec à Montréal, Canada)*

What drew you to this research?
More than ever, individuals are preoccupied by the environment and view climate change as an important issue. The popularity of green products is also growing, and sustainable products or services sold by companies such as Nike and IKEA generate more than $1 billion in revenue per year worldwide. Nonetheless, more than 95% of products that claim to be green were found to commit some level of greenwashing in 2009. Greenwashing is a strategy used to convey false impressions or false claims about a company's products, aims, or policies in order to make them appear more environmentally friendly than they actually are. Consequently, people may come to distrust green products and stop purchasing them altogether.

Research thus far has studied the drivers of greenwashing in products, services, and organizations. To our knowledge, no studies have examined greenwashing's consequences on job seekers and their emotional ties to a company. The present research investigated (a) affective commitment to the company depending on its environmental performance and (b) the mediating role of the perception of greenwashing.

What did the research reveal that you didn't already know?
Our results indicated that a company's positive environmental performance is associated with lower perception of greenwashing, which in turn is associated with higher affective commitment. Bad environmental performance is associated with higher perception of greenwashing, which in turn is associated with lower affective commitment. This suggests that companies ➡ could use green initiatives to make future job seekers feel more emotionally connected to the organization.

Modern Problems Require Modern Solutions: Nature Exposure Through Virtual Reality

Amy Knepple Carney, *Grace Hudson, and Sedona Sig (University of Wisconsin–Oshkosh)*

What drew you to this research?
My two main research interests are healthy aging and well-being, and the connection that humans experience with nature. We know that spending time in the natural world is beneficial

for well-being, but I started to wonder about people who are place bound, especially older adults, and how they could still experience the benefits of spending time with nature. My mentor at West Virginia University, Julie Hicks Patrick, was starting to explore virtual reality and awe, and this made me wonder how virtual reality could be used for nature exploration. By studying how people experience nature through virtual reality, I hope to help people maintain or enhance well-being, especially those people who may not be able to experience "real" nature in person.

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

Research has shown the benefits of empathy for and connection to nature; they increase pro-environmental behaviors and increase positive affect and life satisfaction. Spending time in nature increases those effects, but the current study expands on that research by examining if spending time in virtual nature increases empathy, awe, and connection to nature. We found that after spending only 10 minutes in virtual nature, participants demonstrated increases in connection to nature, awe, and empathy for nature. This shows that even small amounts of virtual nature can have beneficial effects. We will continue to expand on this research and add to the literature by examining which types of virtual nature have the greatest impact on well-being.

The Criticism After the Storm: Biased Judgments and Attitudes About Hurricane Victims

Jeremy V. Hermanson, Desiree K. Miranda, and Elizabeth R. Spievak (Bridgewater State University)

What drew you to this research?

I was interested in the role that implicit bias might play in a study my mentor and lab had worked on previously. In that study, participants described survivors who evacuated ahead of severe storms ("leavers") as "smart" and "responsible," but those who did not evacuate ("stayers") were victim-blamed, criticized, and described as having diminished agency; one of the most commonly used terms was "dumb." In reality, many people are often unable to evacuate—maybe they have nowhere to go, or no way to get there. It's easy for an observer to apply standards of the "right" way to act when the decision was not theirs to make. The bias has implications for individuals, but it also may influence governments and organizations. Hurricanes Katrina and Maria prompted suggestions that the socioeconomic status and the race and ethnicity of survivors played a role in how officials responded. People who do not evacuate are already denigrated, but I wondered if observers judged them even more severely if they thought the survivors were people of color.

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

We never explicitly identified the ethnicity of the leavers and stayers; we only used names that suggested the survivor might be White (e.g., "Ashley") or Black (e.g., "Ashante"). We replicated the previous findings in that stayers were criticized, and we also found that the mere suggestion that the survivor could be a person of color produced significant differences: Participants were more likely to generate negative descriptors regarding competence (e.g., "stupid') and socioeconomic status (e.g., "unfortunate"). We often see that underrepresented groups suffer poorer outcomes during crises (the COVID-19 pandemic is another example), and work like ours may be able to help address underlying biases in public policy or relief efforts. We are continuing our research, and we encourage others to examine victim-blaming and prejudice against crisis survivors.

Positively Valent Images of Climate Change Solutions Capture Attention

Hannah Kaull, Mason Steinhauer, Abbey Zigarac, Jacqueline Cammarata, and Joshua Carlson (Northern Michigan University)

What drew you to this research?

Learning how to capture the attention of others to convey a meaningful message is an incredibly valuable tool nowadays. We are constantly bombarded with stimuli that are pressing for our attention. It can be a challenging prospect to get people to listen and pay attention to one more thing. I became intrigued with this research because I wanted to learn how to most effectively communicate with an audience. Climate change is an ever-pressing issue that only continues to manifest with time. Often, many people feel this issue is too overwhelming and do not know how to do something about it. Therefore, the problem continues to grow with nothing being done. However, if we could come up with a way to draw people's attention, we could see long-lasting impacts.

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

Overall, we learned that people pay more attention to positive images regarding climate change over negative images. Positive images are thought of as solutions to climate change (e.g., windmills and solar panels). Negative images include both the causes and effects of climate change (e.g., smokestacks and rising sea levels). This helps when we are looking at how to best communicate the issue of climate change. If people are more drawn to solutions, then it would be best to include positive images when discussing climate change.

Saving the Planet Starts in the Classroom:
The Impacts of Infusing Climate Change Modules Within Psychology Curriculum

Brittany Burns, Maureen W. Erber, Amanda A. Dykema-Engblade, Lorilene Cuevas, Christopher Merchant, and Masami Takahashi (Northeastern Illinois University)

What drew you to this research?

This research felt important to us because we share great concern for the future of our planet, and we wanted to find a way to help people understand the reality and impact of climate change. As we started to look into why it's so difficult to effectively communicate the threat of climate change to the general public, we found a plethora of literature describing complex internal, sociocultural, political, and economic barriers that inhibit the development of pro-environmental attitudes and behaviors that would help combat it. We wanted to find a method that could help simplify and address these overwhelming challenges while reaching a population with a wide range of environmental values and beliefs. Classroom infusions provided a way for us to expose students in a non-environmental major to climate science information by combining psychology lessons with discussions that included basic facts about climate change. We had hoped these exposures would help socially normalize climate change discussions, therefore promoting a positive change in attitudes and behaviors aimed at helping the environment.

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

We learned that the presence of pro-environmental social norms has a positive impact on individuals' concern for the environment and belief in climate change science. There is ample scholarship demonstrating the influence of social norms on individual attitudes regarding other topics, and we were pleased to find that this also applies to attitudes toward climate change. Our methodology was affected by the abrupt change to remote learning last year, so it is unclear if the pandemic impacted the effect of the modules on developing social norms. We believe it would be worthwhile to develop new, uniform modules that focus on the development of these norms in the classroom in future research.

Eco-Feedback, Pro Environmental Behaviors, and Energy Consumption

Noa Leiter and Nils Olsen (*The George Washington University*)

What drew you to this research?

The increasingly salient and urgent threat of climate change catalyzed my desire to participate in the global imperative to drastically cut CO_2 emissions. Through my senior thesis at The George Washington University, I learned that electricity use in commercial buildings is responsible for a large percentage of U.S. energy consumption and that user behavior can have an important impact on emission reduction. I was eager to understand how organizations were working to reduce their emissions and how they could capitalize on technology to motivate employees to reduce their individual consumption behavior.

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

Our research revealed that if individuals hold sustainable values, feel capable of reducing energy use, and plan to reduce workplace energy use, then they tend to be less concerned about privacy regarding energy monitoring. It also revealed that individuals tend to support the idea of department/group energy-use monitoring more than individual energy-use monitoring. This underscores the importance of finding the most effective way to implement and communicate about electronic monitoring systems in organizations to ensure employee well-being and to have the largest impact on employee behavior. We encourage other researchers to further examine electronic energy-use monitoring to inform best practices for implementation. ●

CONGRATULATIONS, NEW APS FELLOWS

Modupe Akinola
Columbia University

Adam Alter
New York University

Tom Beckers
KU Leuven

Thore Bergman
University of Michigan

Sarah Brown-Schmidt
Vanderbilt University

Dana Carney
University of California, Berkeley

Yawei Cheng
National Yang-Ming University

Arne Ekstrom
University of Arizona

Lisa Fazio
Vanderbilt University

Peter Finn
Indiana University

Stephanie Fryberg
University of Michigan

Lindred Greer
University of Michigan

Janet Helms
Boston College

Daniel Keating
University of Michigan

Heejung Kim
University of California, Santa Barbara

Karin James
Indiana University

Vanessa LoBue
Rutgers University

Douglas MacDonald
University of Detroit Mercy

Keith Maddox
Tufts University

Beth Morling
University of Delaware

Sylvia Perry
Northwestern University

Jennifer Pfeifer
University of Oregon

Cynthia Pickett
DePaul University

Tomi-Ann Roberts
Colorado College

Vincent Reid
The University of Waikato

Krishna Savani
Nanyang Technological University

Abigail Scholer
University of Waterloo

David Sherman
University of California, Santa Barbara

Toru Shimizu
University of South Florida

Kristin Shutts
University of Wisconsin-Madison

Richard Slatcher
University of Georgia

Sonya Sterba
Vanderbilt University

James Szalma
University of Central Florida

Thilo Womelsdorf
Vanderbilt University

Michael Young
Kansas State University

To learn more about APS Fellow status visit **www.psychologicalscience.org/fellows.**

Congratulations
APS Rising Stars

The APS Rising Star designation is presented to outstanding psychological scientists in the earliest stages of their post-PhD research careers.

John Anderson
Centre for Addiction and Mental Health, Toronto

Reut Avinun
The Hebrew University of Jerusalem

Jordan Axt
McGill University

Levi Baker
University of North Carolina at Greensboro

Roger Beaty
Pennsylvania State University

Amy Belfi
Missouri University of Science and Technology

Kate Bentley
Massachusetts General Hospital

Richard Betzel
Indiana University

Jeffrey Birk
Columbia University

Patrick Bissett
Stanford University

Simon Blackwell
Ruhr-University Bochum, Germany

Jordan Booker
University of Missouri

Rosanna Breaux
Virginia Tech

Cameron Brick
University of Amsterdam

Katie Burkhouse
University of Illinois at Chicago

Andres Bustamante
University of California, Irvine

Jimmy Calanchini
University of California, Riverside

Christine Cha
Columbia University

Rob Chavez
University of Oregon

David Clewett
University of California, Los Angeles

Melissa Colloff
University of Birmingham

Caitlin Cowan
The University of Sydney

Hengchen Dai
University of California, Los Angeles

Juliet Davidow
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KU Leuven

Aleea Devitt
The University of Waikato

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New York University

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Michigan State University

Laura Elenbaas
University of Rochester

Jan Engelmann
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Spencer Evans
University of Miami

Jonas Everaert
Ghent University

Jim A. C. Everett
University of Kent

Youssef Ezzyat
Wesleyan University

Allison Farrell
Miami University

Roman Feiman
Brown University

Gilad Feldman
University of Hong Kong

Emily Finn
Dartmouth College

Chaz Firestone
Johns Hopkins University

Jessica Flake
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Texas State University

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University of Southern California

Jessica Hamilton
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Georgetown University

Xiaoqing Hu
University of Hong Kong

Ross Jacobucci
University of Notre Dame

Ryan Jacoby
Massachusetts General Hospital

Julian Jara-Ettinger
Yale University

Kyle Jasmin
Birkbeck, University of London

Abhishek Jaywant
Weill Cornell Medicine

Jessica Karanian
Fairfield University

Dalal Katsiaficas
University of Illinois at Chicago

Nicholas Kelley
University of Southamptom

Justin Minue Kim
Sungkyunkwan University

Philip Kragel
Emory University

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University of California, Irvine

Jeff Kukucka
Towson University

Kosta Kushlev
Georgetown University

Regina Lapate
University of California, Santa Barbara

Karolina Lempert
University of Pennsylvania

Cheri Levinson
University of Louisville

Jianbin Li
The Education University of Hong Kong

Pan Liu
Western University

Richard Lopez
Bard College

Cassandra Lowe
Western University

Camilla Luck
Curtin University

Katerina Marcoulides
University of Minnesota

Luis Medina
University of Houston

Samuel Mehr
Harvard University

Deborah Mitchison
University of Western Sydney

Michael Muthukrishna
London School of Economics

Katie Nelson-Coffey
Sewanee, The University of the South

Eryn Newman
Australian National University

Justin Parent
Florida International University

Praveetha Patalay
University College London

Roland Pfister
Julius-Maximilians-University of Wuerzburg

Jonathan Phillips
Dartmouth College

Taylor Phillips
New York University

Caitlin Porter
University of Memphis

Jennifer Rabin
Sunnybrook Research Institute

Zachariah Reagh
Washington University in St. Louis

Jonathan Redshaw
The University of Queensland

Leah Richmond-Rakerd
University of Michigan

Steven Roberts
Stanford University

Monica Rosenberg
University of Chicago

Danielle Roubinov
University of California, San Francisco

Chris Rozek
Washington University in St. Louis

Mollie Ruben
University of Maine

Giovanni Sala
Fujita Health University

Anna Schapiro
University of Pennsylvania

Gemma Sharp
Monash University

Dexin Shi
University of South Carolina

Andrew Smith
Iowa State University

Adriane Soehner
University of Pittsburgh

Sarah Stanton
University of Edinburgh

Isabel Thielmann
University of Koblenz-Landau

Mark Thornton
Dartmouth College

William Tsai
New York University

Kenneth Vail
Cleveland State University

Elsje van Bergen
Vrije Universiteit Amsterdam

Frederik van Ede
Vrije Universiteit Amsterdam

Alvaro Vergés
Pontificia Universidad Católica de Chile

Peng (Katie) Wang
Yale University

Sara Weston
University of Oregon

Alexis Whitton
University of New South Wales

Michael Wilmot
University of Arkansas

Toby Wise
University College London

Mary Woody
University of Pittsburgh

Kaitlin Woolley
Cornell University

Veronica Yan
University of Texas at Austin

Hongbo Yu
University of California, Santa Barbara

Yao Zheng
University of Alberta

2021 APS MENTOR AWARDS

The APS Mentor Award recognizes psychology researchers and educators who have shaped the future directions of science by fostering the careers of students and colleagues. Four APS Fellows have been selected to receive the award in 2021. Beyond their individual contributions to diverse areas of research, these scholars' dedication to their students and colleagues has helped to foster a thriving global community of psychological scientists.

Casey is beloved for her moral support and enthusiastic celebration of every success, no matter how small—and she doesn't stop championing her mentees after they leave her lab.

BJ Casey is a professor of psychology at Yale University.

BJ Casey

Yale University, United States

APS Fellow BJ Casey is internationally renowned for her groundbreaking contributions to developmental neuroscience, including the first-ever fMRI study on the healthy developing brain. Among her many accomplishments is a stunning number of incredibly successful trainees who have gone on to hold faculty positions at prestigious institutions and establish highly productive research programs.

She is known for her exceptional generosity, mentoring not only those in her own lab but many others from her institution and elsewhere, finding time for each of her mentees despite her busy schedule. Her nominators Dylan Gee of Yale and Catherine Hartley of New York University—both APS Fellows and recipients of the APS Janet Taylor Spence Award for transformative early-career contributions—recall working as Casey's postdoc advisees: "Though her lab had numerous projects to which we could have contributed, BJ selflessly challenged us to develop our own independent lines of research as postdoctoral fellows, which she then supported with her intellectual insights, financial support, staff time, and physical lab space."

Casey has also made it a priority to support women and those of underrepresented racial and ethnic backgrounds, including as an enthusiastic participant in programs that target training diverse scientists, such as The ACCESS Summer Internship Program at Weill Cornell Graduate School and Yale's Justice Collaboratory and Pathways to Science programs.

Casey's students credit her with having a unique understanding of their

needs. She strikes the perfect balance between offering guidance and promoting independence, allowing students to mature into thoughtful scientists. She supports her students not only in their research but also in their other interests, such as teaching and outreach. In addition to offering her knowledge and connections, Casey is beloved for her moral support and enthusiastic celebration of every success, no matter how small—and she doesn't stop championing her mentees after they leave her lab. "To this day," wrote Casey's former graduate student Adriana Galván, now a professor at the University of California, Los Angeles, and an APS Fellow, "she reminds colleagues of results I published over a decade ago, and I know she does so for my peers as well."

Whether serving as a role model, advising and encouraging her mentees, or making sure that her colleagues are aware of their innovative work, Casey has had an invaluable impact. There is no doubt that the field of developmental neuroscience has been significantly expanded thanks to Casey and her tireless mentorship of the next generation of psychological scientists.

Merckelbach's students frequently find that his timely and detailed feedback elevates their work beyond their initial expectations, broadening their experience as scientists in the process.

Harald Merckelbach is a professor of psychology at Maastricht University.

Harald Merckelbach

Maastricht University, the Netherlands

APS Fellow Harald Merckelbach is known for his study of memory distortions, including amnesia and confabulation. He has published hundreds of articles in top journals of the field. As his work has important implications for the legal system, he has served as a member of the Dutch Advisory Committee on Closed Criminal Cases. In addition to these accomplishments, he is an extraordinary mentor, continually going above and beyond to help his mentees think critically about important issues and build successful careers.

Ineke Wessel, a professor at the University of Groningen, recalls that when she began her PhD in the early 1990s, a public debate about recovered memories was emerging in the Netherlands. Recognizing the significance of this event, Merckelbach not only engaged in the debate but invited Wessel to get involved, too. "This collaboration has influenced my thinking profoundly," Wessel wrote. Today, as a professor, Wessel prioritizes teaching "clinicians about the reconstructive nature of memory and the questionable nature of concepts like repression, body memories, and preverbal trauma."

Merckelbach's enthusiasm inspires his mentees not only to produce high-quality research but also to enjoy the process. He is appreciated for his impressive erudition, which allows him to connect seemingly unrelated literatures and thereby generate new interdisciplinary perspectives and research questions. His students frequently find that his timely and detailed feedback elevates their work beyond their initial expectations, broadening their experience as scientists in the process—a quality that former students cherish and strive to emulate for their own mentees years later.

Rather than using his position of authority to dominate conversations, Merckelbach treats his students as colleagues. By defending strong opinions ➡

while remaining open to other ideas, he constantly engages his students in intellectual debate that pushes them to grow as scholars.

Merckelbach also has a keen eye for opportunities suited for his mentees, whether research, co-authorship of articles or book chapters, or networking experiences, such as conferences. "He has no intellectual jealousy," said former mentee Tom Smeets, now head of the Department of Medical and Clinical Psychology at Tilburg University. "He is always happy to see others succeed, to give other people the spotlight while standing back in the shadows himself." He stays in touch with each of his mentees, often becoming a lifelong collaborator. Merckelbach's many successful mentees thank him for his indispensable guidance and support.

Miguel Moya is a professor in the Department of Social Psychology at the University of Granada.

Miguel Moya

University of Granada, Spain

When APS Fellow Miguel Moya began his career, he had few Spanish colleagues in social psychology. Further, in the shadow of Francisco Franco's dictatorship, prejudice in particular was an understudied topic in the country. Over the following decades, Moya worked tirelessly to establish social psychology as a respected academic discipline in Spain and embraced the study of prejudice and marginalization.

Moya's former advisee Ginés Navarro Carrillo, now an assistant professor at Universidad de Jaén (Spain), credits Moya's "rigorous, socially engaged, and dedicated work" as "a model not only [for] myself, but also a whole generation of young researchers." Indeed, for some of Moya's mentees, his engaging undergraduate lectures inspired a lifelong career in the empirical study of human behavior.

Moya advocates for scientists producing high-quality social psychology research to be recognized and rewarded, and he reaches across international and disciplinary lines to form highly productive networks of collaboration. As a result of these values, his students are instilled with a deep appreciation for the importance of teamwork and collaboration.

He makes frequent introductions and encourages students to share their ideas, prioritize attendance at conferences, and form professional relationships that often lead to fruitful collaborations in the future. Soledad de Lemus, an associate professor at the University of Granada who was Moya's doctoral student, remembers that "Miguel promoted me and encouraged me to travel abroad, learn new techniques, and develop strong networking abilities that have been fundamental in my career."

Moya excels at promoting a sense of community. "HUM289," the administrative designation of his research group, has become a sort of group identity,

Moya advocates for scientists producing high-quality social psychology research to be recognized and rewarded, and he reaches across international and disciplinary lines to form highly productive networks of collaboration.

with its members feeling proud to be involved in its important work regarding discrimination and stigma. Not least among the reasons his students so value their work with him is Moya's kind and brilliant leadership. "Miguel has always taken extraordinary care of the student he has supervised… at the research but also the interpersonal level," wrote Rosa Rodríguez-Bailón, now a professor at the University of Granada. His students cherish him for his understanding, humility, warmth, and willingness to help in any way that might further a young scientist's career, going far beyond his explicit responsibilities.

Moya is a professor in the Department of Social Psychology at the University of Granada. He continues to enthusiastically promote the study of social psychology in every way possible.

Spelke's remarkable generosity with her mentees sets her apart as a scientist truly dedicated to fostering the next generation of innovative researchers.

Elizabeth Spelke is the Marshall L. Berkman Professor of Psychology at Harvard University.

Elizabeth Spelke

Harvard University, United States

APS William James Fellow Elizabeth Spelke is known for her incisive analysis of foundational questions about the origins and growth of human knowledge, and she eagerly shares her rich intellectual life with her mentees. Her enthusiasm for science is infectious, and she helps her students to stay motivated by always being ready to engage them in thoughtful conversation. Spelke expertly tailors her approach for each mentee, helping those who already have ideas to formulate concrete research plans while giving others the time and resources needed to spark inspiration.

Spelke teaches her students to develop strict experimental designs that pinpoint important variables. Her keen, curious mind and skill as an experimentalist are incredible assets to her mentees. APS Fellow Fei Xu, a professor at the University of California, Berkeley, who met Spelke as a graduate student more than 25 years ago and went on to work under her supervision as a postdoctoral fellow, recalls that at the time, graduate students would joke that "Liz comes up with a whole dissertation worth of experiments while brushing her teeth in the morning. Every morning!"

In addition to this incredible passion for scientific inquiry, Spelke avidly seeks out opportunities for her mentees to lead and travel, willingly stepping aside when doing so is in her protégés' best interest. Nominator Kristin Shutts, a professor at the University of Wisconsin–Madison, wrote that "On several occasions, I have watched Liz step back from a line of research started by a mentee in her lab so that the mentee has a chance to grow and garner independent recognition."

At every turn, Spelke gives of herself to ensure the success of her mentees, whether that means staying awake late into the night to perfect a mentee's conference poster or making time to serve as the inaugural speaker for a former student's talk series.

Spelke inspires her mentees to believe in and advocate for themselves, leading

them to secure prestigious positions and make significant advances in cognitive and developmental psychology. She maintains contact with each of her mentees, ensuring that they continue to benefit from her support while also creating a network of similarly trained scientists poised for collaboration. Spelke's remarkable generosity with her mentees sets her apart as a scientist truly dedicated to fostering the next generation of innovative researchers.

Moira Dillon, an assistant professor at New York University, considers Spelke the quintessential professor: "She is able to profess not just her knowledge but also her passion for the human mind—indeed, for every human mind." ◦

Video profiles with these and other recipients of the 2021 APS Lifetime Achievement Awards will be available through the Virtual Convention platform and on the APS website after May 27. You can also see interviews with the 2020 Mentor Awards recipients.

ALABAMA

UNIVERSITY OF ALABAMA AT BIRMINGHAM   ASSISTANT PROFESSOR, NON-TENURE-TRACK

The Department of Psychology at The University of Alabama at Birmingham (UAB) invites applications for an Assistant Professor, non-tenure-track, 9-month full-time faculty position to begin on August 16, 2021. The teaching load for this position is four courses per semester (8 per academic year). Teaching assignments will include general courses such as Introduction to Psychology and Research Methods, and may include both traditional and online formats, with additional courses based upon the candidate's area of specialization.

The person selected for this position must have a doctoral degree in Psychology and demonstrate successful teaching experience at the college/university level (minimum 3 years teaching experience). Preferred candidates will be able to teach a variety of courses at the undergraduate level (either in the classroom, online, or both). Successful candidates must demonstrate excellence in teaching as well as a track record of innovative, evidence-based teaching strategies. The salary will be commensurate with qualifications and experience.

The department has 27 faculty with one of the largest undergraduate programs on campus supporting more than 1,300 undergraduate students, with more than 150 students enrolled in the online program and more than 300 students in the Undergraduate Neuroscience Program, an interdisciplinary program. The department offers a Departmental Honors Program and more than 39% of our undergraduate students participate in mentored research.

UAB is a young, dynamic four-year research university offering more than 140 programs leading to bachelor's, master's, doctoral, and professional degrees in arts and sciences, business, education, engineering, and health-related fields such as medicine, dentistry, optometry, nursing, and public health. In the fall of 2019, UAB had 22,080 total students including 13,836 undergraduate students, 5,504 master's students and 2,740 doctoral students from more than 110 countries. UAB is located in Birmingham, Alabama, which has been listed by Partners for Livable Communities as one of America's best places to live, work, and play.
Response Information: Applications should be submitted online through the PeopleAdmin system: http://uab.peopleadmin.com/postings/8545

Applications should include: Cover letter; CV; Teaching portfolio including teaching philosophy, teaching evaluations, and course grade distributions; Names and contact information for three references; Contribution to Diversity and Inclusion Statement
UAB's Department of Psychology is committed to providing an inclusive, equitable and diverse place of learning and employment. As part of a complete job application, candidates are asked to include a Contribution to Diversity and Inclusion statement whereby applicants share how through their teaching they have contributed to, or plan to contribute to, diversity and inclusion efforts on campus and/or beyond.

The review of applications will begin immediately and continue until the position is filled. Please visit our department Web site at https://www.uab.edu/cas/psychology

➡

UAB is an Equal Opportunity/Affirmative Action Employer committed to fostering a diverse, equitable and family-friendly environment in which all faculty and staff can excel and achieve work/life balance irrespective of, race, national origin, age, genetic or family medical history, gender, faith, gender identity and expression as well as sexual orientation. UAB also encourages applications from individuals with disabilities and veterans.

A pre-employment background investigation is performed on candidates selected for employment.

MISSOURI

WASHINGTON UNIVERSITY IN ST. LOUIS   ASSISTANT PROFESSOR

The Department of Psychological & Brain Sciences is seeking candidates for a tenure-track Assistant Professor position to identify an outstanding individual who is using data science or quantitative approaches to address questions central to Psychological Science. All areas of Psychological Science will be considered, but we are especially interested in candidates whose research programs connect to areas of current strength or emerging focus at Washington University, including healthy aging and age-related disorders, cognition, cognitive/affective neuroscience, or diversity science. The individual in this position will conduct research, publish in peer-reviewed journals, advise students, teach psychology or related courses, and participate in department governance and university service. The primary qualifications for this position are demonstrated excellence in empirical research and teaching; a PhD is required in psychology or another directly relevant field. We especially and strongly encourage applications from women and members of minority groups. Diversity and Inclusion are core values at Washington University, and the strong candidate will demonstrate the ability to create inclusive classrooms and environments in which a diverse array of students can learn and thrive.

Send curriculum vitae, reprints, a short statement of research interests and teaching experience, and a statement addressing past and/or potential contributions to diversity through research, teaching, professional activity, and/or service to Interfolio job posting apply.interfolio.com/83694. Also, arrange for three letters of reference to be submitted through our Interfolio site. The Search Committee will begin the formal review process as early as April 15th, 2021, but applications will be accepted until the search is concluded. Washington University in St. Louis is committed to the principles and practices of equal employment opportunity. It is the University's policy to recruit, hire, train, and promote persons in all job titles without regard to race, color, age, religion, sex, sexual orientation, gender identity or expression, national origin, protected veteran status, disability, or genetic information.

Each year Washington University publishes a Safety and Security brochure that details what to do and whom to contact in an emergency. This report also publishes the federally required annual security and fire safety reports, containing campus crime and fire statistics as well as key university policies and procedures. You may access the Safety and Security brochure at police.wustl.edu/clery-reports-logs.

PRECISION IS THE ENEMY OF PUBLIC UNDERSTANDING

By Charles Blue, APS staff

Scientists value precision—it makes results testable and verifiable, allowing research to be extended and even applied outside of the lab. It is often both the metaphorical and literal litmus test for peer-reviewed publications.

But outside of the academic and research environment, highly precise scientific language can create a nearly insurmountable obstacle to understanding. Overly precise terminology is one of the most common points of failure when scientists attempt to explain their work to a lay audience.

The counterpoint to this, of course, is that precision helps to ensure accuracy. When research is translated into lay language, essential qualifiers may be lost, and findings may be misrepresented. But there is a middle ground. The challenge is to ensure information is 100% accurate without being overly precise.

On one end of the precision spectrum is the following excerpt from a news release about cell signaling issued in 2011 by the American Institute of Physics. (Full disclosure, I was involved in distributing this release at the time.)

"The group reports on their use of the macrophage protein CD36, a clustering-responsive class B scavenger receptor, as a model for studying the processes governing receptor clustering and organization."

This sentence illustrates how overly precise terms can obfuscate meaning. Unless you happen to be an expert on cell signaling and the organization of receptors on a cell's surface, you would be hard-pressed to make any sense of this release, even though it was allegedly written for a general audience.

Science writers and public information officers at universities often face similar challenges when translating technical findings for a lay audience. Their work is made even more challenging when researchers insist on language better suited for a technical journal. As Ray Villard at the Space Telescope Science Institute, which manages NASA's Hubble Space Telescope, stated at a media panel, "It doesn't make any difference how precise the results are if nobody bothers to read the story."

One master of balancing accuracy and accessibility is *New York Times* science correspondent Dennis Overbye. Following the detection of the Higgs Boson at the Large Hadron Collider, journalists around the world struggled to explain one of the most complex discoveries in all of science. Overbye's account did so perfectly—and almost poetically: "Dr. Sharma and his colleagues had every reason to believe that they were closing in on the Great White Whale of modern science: the Higgs boson, a particle whose existence would explain all the others then known and how they fit together into the jigsaw puzzle of reality."

The key to this summary is that it didn't rely on mind-numbing figures of colossal energies. Rather, Overbye chose words that were touchpoints for a lay audience. He made complexity approachable rather than daunting.

One way to visualize the relationship between precision and understanding is to consider the concentric rings of a dartboard. The outer ring encompasses all potential readers, from experts to the science-interested lay public. The next innermost ring speaks only to college graduates with some familiarity of the topic.

As precision increases, the audience shrinks until you are speaking only to psychological scientists. Inward still and you're covering intricacies that are obscure to all but a small group of specialists.

When communicating to the public, the bull's-eye is not the center; it is the outermost ring. But you still want to land squarely on the dart board—making an accurate, just not overly precise, throw. ○

What are your questions about communicating psychological science? Email news@psychologicalscience.org.

INDIVIDUALS IN THEIR ENVIRONMENTS: INCREASING RIGOR IN ASSESSMENT

People's social and physical environments can cause their moods, thoughts, behaviors, and symptoms to fluctuate throughout the day. Over the past 30 years, researchers have developed techniques to measure these dynamic processes in participants' daily lives (e.g., Trull & Ebner-Priemer, 2014). These ambulatory assessment methods include experience-sampling methods (ESM; Csikszentmihalyi & Larson, 1987) and ecological momentary assessment (EMA; Stone & Shiffman, 1994).

Researchers often use the terms ESM and EMA interchangeably, although their historical antecedents and original aims differ (Stone & Shiffman, 1994). As Trull and Ebner-Priemer described in a 2014 article in *Current Directions in Psychological Science,* "Experience sampling emphasizes random-sampling schemes and often involves paper-and-pencil diaries and beepers, whereas ecological momentary assessment is most often associated with momentary self-report using electronic diaries." These methods can provide valuable information, but their use requires the researcher to make many methodological and statistical decisions, increasing possibilities for variation and challenging the transparency, reproducibility, and replicability of the research.

To increase the rigor of these methods, Olivia J. Kirtley, Ginette Lafit, Robin Achterhof, Anu P. Hiekkaranta, and Inez Myin-Germeys, of the Katholieke Universiteit Leuven offered a template and tutorial for registration of studies using ambulatory assessment in a recent article in *Advances in Methods and Practices in Psychological Science.* The researchers defined ESM as a method in which participants complete brief questionnaires one or more times per day—most commonly via a smartphone app—to give in-the-moment reports on their thoughts, behaviors, contexts, and emotions.

Challenges to the use of experience-sampling methods

Kirtley and colleagues discussed threats to transparency, reproducibility, and replicability in ESM research.

- Calculations of power and sample size are more complex in ESM research because of the multilevel nature of the data.

- Compared with other methods, ESM requires additional considerations about item selection, psychometrics, and analytic strategy.

- Researchers using ESM must make many choices to develop a study, which can introduce more points of variation among studies and make them harder to reproduce and replicate.

- Many analytical choices may exist for the same data set, creating analytical flexibility, which also threatens reproducibility.

Registration as a means to improve rigor in ESM

"Registration is a tool with great potential to increase transparency, reproducibility, and replicability within ESM research," wrote Kirtley and colleagues. However, registering ESM studies might not be as straightforward as registering non-ESM studies. ESM uses complex models and needs a priori strategies for handling when the model's estimates do not converge with a clean solution. It also usually involves multiple researchers with varied research questions, making it difficult to detail all the prospective analyses before data collection.

Kirtley and colleagues discussed ways to select models, account for potential model-convergence issues, use preexisting data sets, and document these sets in preregistration. They made several additions and modifications to the Preregistration Challenge template (Mellor et al., 2019) to create a new template that facilitates the registration of ESM studies. While developing this template, Kirtley and colleagues considered "(a) specific characteristics of ESM studies that may affect or even preclude their replicability and reproducibility and (b) aspects that may be vulnerable to questionable research practices or analytic flexibility, particularly after data have already been (partially) accessed."

What to register using the new template?

Sampling plan

- **Data-collection procedure.** Kirtley and colleagues added this new subsection to increase transparency about data-collection decisions, including sampling schemes, methods, and participant incentives.

- **Study duration.** You may have to change the planned duration of an ESM study after data have already started being collected (e.g., if participants show reduced compliance). You can address this issue before conducting the study by specifying, and registering, a rule to follow in case more data are needed.

- **Type of sampling scheme.** The timing of questionnaire prompts in ESM (e.g., when a specific event occurs vs. randomly) should depend on the construct that you want to measure. Your registration should specify that temporal design.

- **Total number and type of items (open-ended or close-ended).** Many reports of ESM studies have described only the variables analyzed. However, detailing the number, order, and type of all items is important to understand some patterns of results (e.g., the questionnaire's length might have an effect on the compliance rate) and facilitate future replications.

- **Time-out specifications.** The template has space for you to provide a theoretical rationale for and register decisions about how long participants have to begin responding to a questionnaire, to respond to one item, or to complete a full questionnaire.

- **Details about instructions and practice questionnaires**, which are important for reproducing the study's methods.

- **Rationale for sample size and temporal design**, including power analyses that calculate the required sample size to find an effect.

- **Stopping rule.** You may want to implement a rule that specifies a threshold number of participants before data collection must stop.

Usually, such rules are based on power analyses. Power analyses can also indicate the minimum number of measurements per person to reach a certain level of power; your stopping rule should account for this threshold, too.

Variables

Kirtley and colleagues' template asks researchers to specify measured variables and manipulated variables. It will ask you to describe in detail only the variables you will use in confirmatory analyses, but you must provide a full list of the ESM items as well. The template also includes subsections for measured non-ESM/time-invariant variables (e.g., gender) and measured ESM/time-variant variables (e.g., moment-dependent mood). Finally, given the multilevel structure of ESM data, the template asks you to specify varying levels of both measured and manipulated ESM variables.

Prior knowledge of the data

When researchers use preexisting data, any knowledge of the data can lead them to make data-dependent decisions. Report any prior knowledge, as well as the source of it (e.g., conference presentations, preprints).

Analysis plan

- **Model complexity and convergence issues.** Register how you plan to evaluate model complexity and what you will do when data violate assumptions, the model does not converge, or other analytic problems arise.

- **Model selection and robustness.** Register the criteria used for model selection and all information needed to reproduce the analysis (including the software used). For instance, if you estimate a model using a Bayesian approach, your analysis plan can describe the distribution of the parameters as well as the priors.

- **Excluding data and handling missing data.** In ESM studies, factors such as compliance and technical issues can affect the data quality. Specify data-exclusion criteria in the analysis plan, including exclusion criteria related to technical problems. It is also important to state how missing data and outliers will be handled. ●

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PORNOGRAPHY'S PREVALENCE, PURPOSES, AND PERILS

By David G. Myers

In this Internet era, pornography is a big deal. Just one website, Pornhub.com, averages 115 million daily visits, report Joshua Grubbs and Shane Kraus. U.S. surveys, they add, indicate that 68% of adolescents have viewed pornography, and one in two men and one in six women do so each week. Research on pornography use can be relevant to numerous domains in psychological science, including relationship research, adolescent development, and clinical science.

In recent books and articles, Philip Zimbardo and Nikita Coloumbe (2016) and Gary Wilson (2017, 2021) have pointed to the perils of young men's excessive pornography use. They report pornography use is associated with excessive video game use and that both offer images of conquest. In correlational studies, online pornography use has also predicted erectile dysfunction, "anorgasmia, low sexual desire, delayed ejaculation, and lower brain activation to sexual images" (Zimbardo et al., 2016). Over time, Zimbardo and Coloumbe added, the huge increase in streaming online pornography has presaged a soaring rate of erectile dysfunction in young men—from 1% among men under age 25 in Kinsey's 1950s to approximately 25% today. Voluntary pornography abstinence has been shown to enable a rebooting of men's sexual functioning.

Are young men's virility and sexual responsiveness depleted by excessive pornography consumption? Does pornography, as Zimbardo and colleagues have said, "mess with manhood?" If so, why? Students who know about habituation may explain how compulsive pornography use might desensitize people to normal sexuality.

In their review, Grubbs and Kraus take a deeper dive into the psychological science of pornography use. First, they note (as perhaps your students could) pornography's potential benefits: as a means of discovering and affirming one's sexual identity, of facilitating solitary sexual pleasure, and of enhancing their sexual variety and satisfaction within a relationship. Indeed, as Grubbs and Kraus report, there is a "robust literature" indicating that sexual media convey sexual scripts that people bring to their relationships. In one national survey, a quarter of 18- to 24-year-olds said pornography was their most helpful information source about how to have sex (Rothman et al., 2021). Such scripts can enable "greater sexual novelty and variety" and "greater sexual closeness" in couples, report Grubbs and Gola (2019).

But content analysis of sexual scripts in 4,009 scenes on Pornhub and XVideos found that 45% and 35%, respectively, depicted violence—most commonly spanking, gagging, slapping, hair pulling, and choking—with 97% of such actions targeted toward women (Fritz et al., 2020). Research—including longitudinal studies—has indicated "consistent links" between pornography consumption and (in both adults and adolescents) increased sexual aggression and infidelity, greater sexual objectification, and diminished sexual satisfaction with real partners who cannot rival the sexual performance of actors (Grubbs & Gola, 2019). In one study of 1,694 teens, boys exposed to violent pornography were two to three times more likely to perpetrate dating violence (Rostad et al., 2019).

Are Zimbardo and his colleagues right to conclude that extensive pornography use can produce sexual dysfunction? Grubbs and Kraus acknowledge that "self-reported problematic" (compulsive or extreme) pornography use does correlate with erectile dysfunction—a finding reported by others (Bőthe et al., 2021). But they argue that the link is "not directional or causal."

Observing that some clinicians have noted a growing epidemic of pornography addiction, Grubbs and Kraus report that there is not, as yet, a scientific consensus about such addiction. The World Health Organization has, however, added a new behavior disorder to its International Statistical Classification of

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Research on pornography use can be relevant to numerous domains in psychological science.

Diseases and Related Health Problems: *compulsive sexual behavior disorder,* which it defines as "a persistent pattern of failure to control intense, repetitive sexual impulses or urges, resulting in repetitive sexual behavior over an extended period." "Problematic pornography use" may meet this diagnostic criterion, and Grubbs and Kraus's own national survey revealed that 11% of men and 3% of women "reported feeling at least somewhat addicted to pornography." Addiction is especially problematic among highly religious individuals (such as the Atlanta spas mass shooter) who experience "moral incongruence"—an inner dissonance between their moral standards and their behavior.

Amid the ongoing debate about pornography's influence, this much is certain, Grubbs and Kraus conclude: In our 21st-century world, pornography use is a big deal, and an under-researched one. Future clinical research should explore the epidemiology and treatment of problematic pornography use and its co-occurrence with psychiatric disorders. Researchers might also explore the impact of the pornography industry on its actors. And they might explore the outcomes of viewers' attempts at self-regulation.○

STUDENT ACTIVITY: EFFECTS OF PORNOGRAPHY USE

Most undergraduates, say Grubbs and Kraus, have seen pornographic material and are aware of its prevalence. Without invading students' privacy by asking them about their own personal exposure and reactions, instructors might introduce this sensitive but important topic by asking four questions:

1. Have you been aware of fellow students' pornography use, either during your high school days or more recently?

2. What effects—benefits or harms—might you expect from regular pornography consumption? Might this differ by the viewer's age?

3. What type of research might assess pornography's effects? (This provides an opportunity to illustrate what we can learn from correlational/cross-sectional, longitudinal, and experimental methods.)

4. What research could benefit from including variables related to pornography use?

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See all references online.

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

HOW PSYCHOLOGY CAN HELP PEOPLE SAVE FOR A RAINY DAY

By Cindi May

Hall, C. C. (2021). Promoting savings for financial resilience: Expanding the psychological perspective. *Current Directions in Psychological Science, 30*(1), 49–54. https://doi.org/10.1177/0963721420979603

Experts recommend that every adult have 6 months' worth of savings to cover essential living expenses in case of emergency, such as lost wages during a global pandemic. Despite this long-standing belief, Federal Reserve data indicate that as of 2019, Americans had a median balance of only $5,300 in their bank accounts—enough to cover little more than a month's expenses for a middle-class family—and that 39% of Americans have insufficient funds to cover a $400 emergency. This lack of sufficient personal savings is a problem not only for those whose accounts are low but also for a society aiming to lift people out of poverty and help them achieve self-reliance.

Crystal Hall at the University of Washington notes that policymakers and applied behavioral science researchers have attempted to develop interventions that encourage individuals to save not only for emergencies but also for retirement, children's college funds, or a down payment for a house. These efforts, while well-intentioned, have yielded mixed results. Although the strategies are rooted in principles of behavioral psychology and economics, Hall argues that they have fallen short because they offer broad, one-size-fits-all approaches to savings. She posits that findings from social and personality psychology

STUDENT ACTIVITY #1: PRINCIPLES OF PERSONAL SAVING

To begin a conversation with students about ways to increase personal savings, first have students review two strategies for encouraging savings that have recently been promoted:

- Targeting tax refunds: People are encouraged to save when they receive their lump-sum tax refund. The $aveNYC program, for example, offered low-income tax filers the opportunity to open a savings account with their refund and receive a 50% match on their investment (Key et al., 2015).

- Linking savings to prizes: People are rewarded for saving money with a chance to receive a monetary prize. The odds of winning increase as savings increase (Kearney et al., 2010).

Ask students to identify the psychological principles that these strategies address. Examples include the tendency to procrastinate (e.g., rather than planning to save later, save your tax refund now and receive matching funds) and status quo bias (e.g., rather than do nothing, save money and receive a chance to win more).

Then ask students to identify people to whom these broad strategies might appeal and people for whom they might be less effective. Research has shown that the prize-linked savings strategies, for example, are most appealing to men, people who play the lottery, and people who show high optimism (Atalay et al., 2014; Filiz-Ozbay et al., 2015).

> **"The psychological sciences can go beyond simply trying to illuminate what factors are related to savings and incorporate more research on how to more effectively design interventions and mechanisms to encourage that behavior."**
> **—Crystal Hall, University of Washington**

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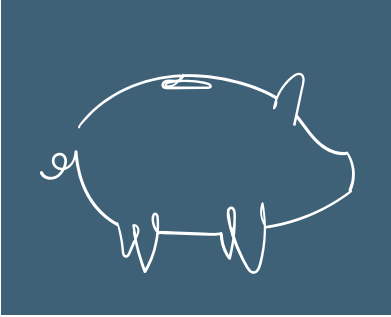
could inform and further hone these strategies—in particular, by shedding light on the ways in which both individual differences and social forces affect decisions about when, why, and how much to save. ◉

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STUDENT ACTIVITY #2: HOW TO PROMOTE SAVING

Hall argues that these general approaches have gaps and can be refined and improved by utilizing knowledge from three areas of social and personality psychology: individual differences, culture and context, and power and privilege. To explore these areas, put students in teams and have them consider each area in turn.

First, have students generate individual-difference variables that might influence savings. Examples include gender, optimism, locus of control, culture, and materialism. Then ask students to consider environments and contexts that might encourage (or discourage) savings. As one example, prompting individuals to focus on one aspect of their identity (e.g., parenthood) by using visual cues (e.g., photos of children) might encourage greater savings. As another example, savings rates in the United States have increased dramatically during the COVID-19 pandemic for many reasons, including a lack of travel opportunities and uncertainty about job stability. How might we encourage individuals to maintain these saving patterns when life returns to "normal"? Finally, have students discuss whether being the target of prejudice or discrimination might impact saving behavior. For example, ask students to consider how systemic and institutional forces, such as low minimum wages or discrimination in granting loans to small businesses, might affect a person's ability to save.

With these factors in mind, have students evaluate the four popular saving apps. See this article online to download a handout of the app matrix. Each app targets a different purpose for saving (e.g., emergency fund; retirement). What psychological principles are in play for each app? For whom do students think the app will be most appealing and effective? What weaknesses can students identify? How would students use their understanding of social and personality psychology to further improve these apps? If they were to create their own, what would it look like, and why?

Sonya Sachdeva (in blue, center), a researcher with the U.S. Forest Service's People and Their Environments unit, at a Jamaica Bay cleanup in New York led by Sadhana, a local nonprofit, in July 2017.

SONYA SACHDEVA ON THE U.S. FOREST SERVICE

Sonya Sachdeva
Spotlight

Current role: Research social scientist at the U.S. Forest Service, 2015–present

Previously: Postdoctoral researcher, Northwestern University, 2012–2014

Terminal degree: PhD in cognitive science and statistics, 2005–2010

Sonya Sachdeva is a social scientist with the U.S. Forest Service, based in Evanston, Illinois. She uses research on moral decision-making and sociocultural influences to improve the human dimension of natural resource management.

Landing the job

After my postdoctoral position at Northwestern, I worked in the private sector for a bit, and that's where I honed a lot of the computational skills that I use currently in my work—programming, natural language processing, those types of things. And then over that time frame, I learned about this position through a flyer that came in my email—I think I still have that flyer somewhere. It sounded like the most perfect job description I could have written for myself, so I applied.

The federal hiring process is not easy. It was 6 months, I think, from finding out about the job to actually getting the offer, but it's been very worthwhile. A lot of the research efforts that happen at the Forest Service are very ecologically based, but our unit, People and Their Environments, is one of the few units that is completely comprised of social scientists or people who are working on the human dimension of natural resource management.

From basic to applied

When I was a doctoral student, my primary area of research was looking at morally motivated decision-making and, specifically, the sociocultural influences on how people make decisions. Now my research is even more refined because so much of our work has a very explicit application focus. The whole dichotomy between basic and applied research is very blurry within the Forest Service. We are very practitioner oriented; we're thinking about how the work that we do can have an impact not just on our national forests, but on the broader public.

Scaffolding environmental stewardship

One project we've been working on is in Jamaica Bay in New York. This particular bay is used by all sorts of local community members, including the local Indo-Caribbean Hindu population. In a lot of Hindu ritual practices, you need access to a source of flowing water, so they treat the bay as a proxy for holy rivers in India. In my postdoc, I'd done work with Hindu people who use the Ganga River for religious practices, so to find that same kind of instance happening here in New York City was just amazing.

We partnered with this local non-governmental organization, Sadhana, that works to both foster these religious sentiments and, at the same time, alleviate some of the tensions that have arisen as a result of these practices. There have been local fisher communities, for example, and even people at the National Park Service who say that some of the practices may be damaging to the fragile ecosystem of the bay. In response, Sadhana has been doing a really fantastic job organizing monthly cleanups and using religious values to scaffold environmental stewardship practices.

Over the course of a year or so, we participated in these cleanups and interviewed a lot of the people there about their journey to becoming environmental stewards of the bay. That's probably the most application-focused research project that comes to mind because it was fully conceived and determined by the practices that were already occurring.

Public lands in a pandemic

On a personal level, I don't know a single female working academic with young children who has not been impacted by the pandemic just in the sense of having less time to work. It feels like there are a lot of constraints these days and things that are pulling me in hundreds of different directions.

In terms of research topics within the realm of natural resource management, we're using social media to compare people's engagement with green spaces before and after the pandemic. The impact of COVID-19 has been unparalleled because we now see that the outdoors have become a place of respite for people. In the absence of basically any other type of recreational activities, people are now flocking to the national parks, city parks, and all of the other green spaces. We've also seen youth engagement increase on all public lands.

Compassionate conservation

The fellow scientists and researchers that I've met at the Forest Service are pretty amazing. Not only are they incredibly intelligent, compassionate, engaged people, but they just have this love of nature and trees and our forest that you would not believe. Many times, the people who do social science research are, by choice or not, confined to their lab environment, but that's not the case with the Forest Service. Every single person here is really committed to conserving our public lands, and that's just amazing to see.

Flexing federal funding

There have definitely been some challenges in this. We don't have the same degree of flexibility that academic researchers might. Of course, that's kind of tempered by the availability of resources that we have and the fact that we're able to work with the entire system of the national forest, which is such an advantage. There are some challenges, though, in learning about the processes and systems that are in place. Another big challenge is that our funding is determined by Congress, and there has been so much uncertainty over the past several years.

Exploring experimental methodology

On the Forest Service side of things, I hope to be able to do work that can inform policy and management decisions in more meaningful ways. In one of the projects that we're working on right now, we're trying to bring natural language processing into the ways that the Forest Service functions to make it more efficient, flexible, and responsive to the public's needs.

Eyes wide open

Often, in a graduate program, everything is gearing you toward finding faculty positions, but there are a lot of other career pathways. I would encourage people to look on USA Jobs, look at their local- and city-level parks departments or forest departments and organizations like the Nature Conservancy. So many organizations and public institutions are doing amazing research, and so much of it can be even more impactful, perhaps, than going the traditional academic route. Keep your eyes and ears open, and be mindful of these other opportunities. ●

TO WORK OR NOT TO WORK

How full-time employment can set you up for success in grad school

By Meghan Davenport

Right now, many undergraduates looking to pursue a career in psychology might be considering whether to enter the workforce or go straight to graduate school. If that's you, I would like to share what I found to be some pros and cons of working full-time outside of academia before returning to school to pursue my PhD.

In the spring of 2015, I was in my senior year at Rice University. I was finishing up my senior thesis project, which had sparked my curiosity about research as a potential career path, but I was too late in the game to apply to start grad school in the fall. I had to decide—should I look for post-bac research opportunities and plan to apply next cycle, or apply for full-time jobs that didn't involve research? In the end, I worked at a public charter school system, helping teachers navigate the alternative certification process. Although I felt that taking a few years off to work before returning to graduate school for my PhD was absolutely the right call for me, any number of factors

My work experience breathes life into academic texts. As I read articles or think about research ideas, I have workplace experiences that I can tie in to what I'm doing.

might affect the decision for you. Work experience during your undergrad degree, as well as issues related to citizenship status, family, or financial concerns can all factor heavily into your decision. Additionally, not all jobs are created equal (I should know, as I study I/O psychology!), so you may get completely different things out of your work experience than I got out of mine.

The pros of working before starting graduate school

The first (and most obvious) benefit is that you'll be making money! This could enable you to start paying down any existing debt, travel, or contribute to your personal savings, retirement, or health savings accounts. Having money saved could also provide you with additional flexibility to cover fees and costs associated with graduate school.

For me, one of the most attractive parts of working was the ability to take a breather from the "always-on" mentality of college. Though workplace stressors can be significant in their own way, you will likely have some true "off the clock" time without the nagging thought that you should be studying or working instead. This could help you get into a routine and break some of the bad habits you may have formed in college, like procrastinating or pulling all-nighters.

As you build your post-college routine, you'll get to know yourself better. After all, although college can feel relatively unstructured, it does impose certain norms and restrictions on your lifestyle. At work, there is no syllabus to follow and no grades against which to measure your success—you must learn which strategies for organization, management, and motivation work for you. You learn

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> **At work, there is no syllabus to follow. You must learn which strategies for organization, management, and motivation work for you.**

how you prefer to work, what you like to work on, how you like to be managed, and how to communicate those preferences to others. In addition, you're more able to explore interests outside of work.

In college, you are likely surrounded by people who are relatively similar to you just by virtue of being in a similar stage of life and at the same university. In your post-college friends and coworkers, you can build a network of people with diverse life experiences, interests, and ages. When you start graduate school, you can keep spending time with them in ways that have nothing to do with school, which can be incredibly refreshing once you are surrounded by classmates who often default to discussing schoolwork or research.

One thing that I carried with me to grad school was the knowledge that the grass is not always greener outside of the academic world. At times when my studies seem overwhelming, it helps to know that the working world can be just as challenging, if not more so, in its own way. Thanks to my work experience, I'm not under the illusion that my stress will magically disappear once I graduate and start working. This has given me more of an appreciation

for the positive sides of grad school, such as autonomy, growth, mentorship, and the community of like-minded people who share my interests. I don't take these things for granted because I remember when I was sitting at my desk job wishing for them.

You may also start working and find a pathway to your goals that doesn't require a graduate degree at all. This would certainly spare you time, money, and the stressful experience of going through grad school unnecessarily. For me, it did the opposite, cementing my desire to continue my education. However it shakes out for you, it's a win-win situation!

Finally, a benefit specific to my research as an I/O psychologist is that my work experience breathes life into academic texts. As I read articles or think about research ideas, I have workplace experiences that I can tie in to what I'm doing now. I'm sure that my classmates and professors are sick and tired of hearing about these experiences, but I cannot say enough about the benefit of having real situations to tie to more abstract concepts.

Consider the cons

Undergraduates may worry that work in any capacity other than a research position will make them a less desirable grad school applicant. It can also feel intimidating to solicit reference letters from former professors and wonder whether they even remember you or if current undergraduates are getting stronger recommendations. Adding to this, prospective grad students are often advised to seek only academic reference letters. To manage this, be sure to keep in touch with professors who could serve as references down the road. Ultimately, being able to talk about the skills and knowledge you developed during your time in the workplace can be a compelling differentiator in your application.

Moreover, once you overcome these hurdles and start your program, the transition may not be easy. Getting back into the rhythm of school can be tough, and you may find homework and test-taking newly foreign concepts. Scaling back your lifestyle from a salary to a stipend can be an additional challenge. And if your program does not offer a stipend or you self-fund, this transition can be even more jarring.

So, what should you do?

Going to grad school is a huge decision that should not be taken lightly. If you choose to continue your education, do so because you want to, not because you can't think of a better alternative. Taking a job outside of academia isn't a consolation prize or a failure—it can actually set you up for success by clarifying your decision of whether to go to grad school and equipping you with knowledge, experiences, and skills to become a better grad student. ○

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ENVIRONMENT AND DISINHIBITION

Arielle Baskin-Sommers is an associate professor of psychology and psychiatry at Yale University and a recipient of the APS 2021 Janet Taylor Spence Award. Her research explores the cognitive-affective processes associated with disinhibition, or a lack of restraint, and how it manifests in behaviors including impulsivity and a disregard for social norms.

Arielle Baskin-Sommers
Yale University

What environmental factors can contribute to antisocial behavior and other forms of disinhibition?

Currently, my lab is focusing on two main environmental factors: community disadvantage and exposure to community violence. Since the early 2000s, the number of disadvantaged neighborhoods in the United States has been growing steadily and significantly. The features of concentrated disadvantage extend beyond economic poverty and include social, political, cultural, and spatial dynamics. These dynamics appear to have wide-ranging consequences, impacting cognitive and neural processes related to both resource decision-making and decision-making around social interactions.

Additionally, we examine the impacts of community violence exposure on learning and trust—cognitive mechanisms that appear to be associated with justice system contact and poor outcomes across a range of behavioral and mental health domains.

What are some of the interventions you're working on?

One is a communication training aimed at corrections officers. We chose the correctional setting for three reasons: Levels of exposure to violence and community disadvantage are significantly elevated among incarcerated individuals; the prison environment itself continues such exposure; and interactions with corrections officers are often filled with procedural injustices that fuel an already high level of distrust among incarcerated people. What is novel about this intervention is that it utilizes information about how incarcerated individuals respond to environmental cues and then trains officers to communicate in ways that acknowledge the effects of these mechanisms.

Components of this training include teaching officers how to (a) convey trustworthiness, fairness, and respect and (b) provide incarcerated individuals with opportunities to express, safely, their concerns. Our aims are to increase the well-being of both officers and incarcerated individuals by promoting procedural justice and, hopefully, changing the correctional environment so as not to reproduce the adverse environmental factors found in the community.

What common misconceptions do you hope to overturn with your research?

It is commonly thought that changing the environment alone, such as increasing opportunities, providing better quality and safer housing, improving education, and increasing procedural justice, will result in more prosocial behavior. While that might work for many individuals, it tends not to be sufficient for those most involved in antisocial conduct. Instead, for these individuals, there must also be changes in their cognitive and affective responses to the environment. Therefore, interventions need to address both the person and the environment in ways that are scientifically informed.

Another misconception is that the cognitive-affective responses to concentrated disadvantage and exposure to violence are maladaptive. However, our lab has demonstrated that some responses may actually be adaptive in certain contexts. For example, while not trusting other neighborhood residents might be maladaptive in some neighborhoods, it can actually be adaptive for those living in communities of disadvantage because it offers protection from predation and from criminal justice contacts. ○

For a longer version of the interview, see this article online at psychologicalscience.org/observer/abaskin-sommers.

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Time-Sensitive Material