What We Know Now: How Psychological Science Has Changed Over a Quarter Century

October 31, 2013

This article is part of a series commemorating APS's 25th anniversary in 2013.

Psychological science has experienced an unprecedented period of growth and advancement during the last 25 years. Since APS was formed in 1988, many disciplines within the field have flourished and expanded. And entire new sub-disciplines, areas of research, and methodologies have sprung up during that time. What's been especially noteworthy about these areas is the fact that they cross both disciplinary and geographic boundaries, marking a trend toward a global, integrative approach to psychological research. This has involved the full range of disciplines, from the broadest cultural aspects of social science to the most molecular aspects of genetics, ushering in a new era of integrative science. In this penultimate installment of our celebratory 25th Anniversary series, we highlight some of the fields that have emerged or dramatically matured over the past two-and-a-half decades, and how they have increasingly integrated other scientific disciplines and international collaboration.

Social Neuroscience

Since the first study using functional magnetic resonance imaging (fMRI) was published 20 years ago, neuroscience has expanded into a variety of areas, with psychological researchers playing a significant role in that evolution. Social neuroscience emerged as an interdisciplinary field devoted to understanding how social forces affect physiology, as well as how physiology influences social interactions.

APS Past President John Cacioppo, a professor at the University of Chicago, and APS Fellow Gary Berntson, The Ohio State University, began developing this new field in the 1990s. By employing brain scans, monitoring of autonomic and neuroendocrine processes, and assays of immune function, Cacioppo and colleagues found that social context alters genetic expression. Cacioppo's research also showed that when people feel lonely, their behavior and physiology are disrupted, creating a trap that reinforces their isolation.

Cacioppo and a University of Chicago colleague, APS Fellow Jean Decety, led a series of consultations for several years with social neurobiologists, psychologists, neuroscientists, psychiatrists, and others to create the Society for Social Neuroscience in 2010. In addition, the young field has spawned similar areas of study, such as affective neuroscience, which explores the neural mechanisms of emotion; cognitive neuroscience, which centers on how the brain mediates social interactions; and cultural neuroscience, the study of how cultural values, practices, and beliefs mold the mind, brain, and genes, and vice versa.

Behavioral Economics

Nobel laureate and APS William James Fellow Daniel Kahneman, a professor emeritus at Princeton University, and his friend and collaborator, the late APS William James Fellow Amos Tversky, pioneered the development of a new approach to economic theory in the 1970s and 1980s along with a young economist named Richard Thaler. They began studying how social and emotional factors influence economic decisions, and challenged long-held assumptions that consumers and investors make decisions based solely on self-interest. Their work focused particularly on human judgment and financial decision-making under uncertainty. By the 1990s, the term "behavioral economics" embedded itself in the scientific vernacular and was picking up considerable momentum. Other leaders in the field emerged, including Duke University's Dan Ariely, who studies subjects such as the psychology of money and cheating; APS Fellow Robert Cialdini of Arizona State University, an expert in the psychology of persuasion; and Columbia University's Elke Weber, a past APS Board Member, who studies risky financial decision-making.

Behavioral economics is drawing strong interest from government leaders. The United Kingdom has a Behavioural Insights Team that has found a variety of techniques to cue people to act in their own self-interest, and thus lessen the burden that bad habits place on society. And the US government is planning to create a similar team.

What's more, behavioral economics is underscored in the sub-discipline of neuroeconomics, which uses neural imaging to identify which areas of the brain become active during particular tasks.

Educational Neuroscience

Uniting researchers from educational psychology, cognitive neuroscience, educational technology, and other disciplines, this emerging field focuses on the interactions between biological processes and education. Researchers in educational neuroscience examine the neural mechanisms of reading, math comprehension, attention, as well as such learning disabilities as dyslexia and attention deficit disorder. Among the leaders in this field is Kurt Fischer, a Harvard University developmental psychologist and founding president of the International Mind, Brain, and Education Society; Nora S. Newcombe (Temple University), who studies spatial cognition and development, and is principal investigator of one of the six National Science Foundation–funded Science of Learning Centers, the Spatial Intelligence and Learning Center (SILC); and Antonio Damasio, director of the Brain and Creativity Institute at the University of Southern California. All are APS Fellows. The expanding interaction between these various disciplines has spawned graduate programs at such leading institutions as Vanderbilt University, University College London, and the University of Cambridge.

Newcombe will speak at the 2014 APS Annual Convention*, to be held May 22–25, in San Francisco, CA, USA.*

False Memory Research

The last 25 years has ushered in a plethora of studies demonstrating that memory is not only fallible, but highly suggestible. The foremost figure in this area is APS Past President Elizabeth F. Loftus, who has focused the bulk of her research on the psychological and legal aspects of distorted or false memories. In an array of studies, she has demonstrated the ease with which memories and beliefs can be molded. She

demonstrated that eyewitness testimony is often unreliable and is subject to contamination and manipulation. In some of her best-known work, she has shown that false memories can be triggered in individuals merely through the power of suggestion. Loftus's expertise was central to stemming the "recovered memory" hysteria that swept this nation in the 1980s and 90s as she challenged people's claims that they had uncovered — often with the help of therapists — repressed memories of abuse, molestation, and even alien abduction.

Other leaders in advancing the understanding of memory distortion include APS Past President Henry L. Roediger, III, and APS Fellow Kathleen McDermott, both of Washington University in St. Louis. Roediger and his team have demonstrated that people can incorporate aspects of present events into their memories, leading to very vivid — but untrue — memories. Roediger and McDermott's research includes the development of the Deese-Roediger-McDermott paradigm, which demonstrates that when people are given a list of words strongly related to a central (but not presented) word, there is a high probability of falsely remembering the associated word that was not presented. His research into other false memory procedures helped further research on "imagination inflation" — the idea that imagining an event can lead to the later belief that it really happened

APS Fellow Daniel L. Schacter of Harvard University has explored the factors that may influence memory distortion in brain-damaged patients and older adults, such as over-reliance on general similarity or gist information. His work has also used neuroimaging methods such as functional MRI to investigate similarities and differences in brain activity during true and false memories. He has also shown that remembering past experiences recruits many of the same brain regions as imagining possible future experiences.

Roediger and Schacter will speak at the 2014 APS Annual Convention*, to be held May 22–25, in San Francisco, CA, USA.*

Behavioral Epigenetics

In 2004, McGill University researchers Michael Meaney and Moshe Szyf discovered that the style of mothering a lab rat receives in infancy determines how that rat responds to stress. Rat pups that received less care in their upbringing were more sensitive to stress throughout their lives, an effect the researchers linked to modifications in brain tissue, particularly in the hippocampus, a brain region that regulates stress responses. This spawned an escalating interest in epigenetics — how environmental factors can alter behavior by biochemically changing the function of genes or gene expression without altering the genetic code. The first study that directly linked epigenetic changes in human brains to behavior involved an epigenetic modification in the hippocampus among individuals who had been abused as children.

Epigenetics could have far-reaching effects. It could, researchers say, shed light on the persistent and often intergenerational health problems among people raised in lower socioeconomic environments, and on the cycle of abused children growing up to be abusers. However, behavioral epigenetics remains very new and its importance for understanding the basis of individual differences in vulnerability is yet to be understood.

The field received some strong attention in 2010, when a first-of-its-kind international meeting of

scholars and researchers was held at the University of Massachusetts Boston. Organizing the forum were UMass Boston psychology professor and APS Fellow Ed Tronick and Barry Lester, professor of psychiatry and human behavior at the Brown University Warren Alpert Medical School, with sponsorships from the New York Academy of Sciences, the Brown University Warren Alpert Medical School, and UMass Boston's Developmental Sciences Initiative. There is now even talk of forming a professional association to support and advance the field.

Implicit Association and Bias

Over the last quarter-century, social psychologists have pioneered the study of unconscious and automatic thought processes that most people would rather not possess. APS William James Fellow Anthony Greenwald, at the University of Washington, invented the Implicit Association Test (IAT), which was then developed in extensive collaboration with APS Past President Mahzarin R. Banaji of Harvard and APS Fellow Brian Nosek of the University of Virginia. The IAT employs association techniques and has been extremely effective in revealing implicit racism and other forms of bias. Since it debuted on the Internet in 1998, the IAT has been taken millions of times online, helping those who take it gain a new sense of self-awareness. Psychological scientists have since demonstrated the presence of implicit bias in a variety of contexts, including elections and courtrooms.

Hundreds of papers have been written about the IAT, with scientists examining in particular the impact that the implicit biases have on behavior. While some have questioned the test's interpretation, researchers continue to refine and hone the test and are actively conducting further research to address issues relating to the IAT, including its use for such purposes as diversity training and clinical diagnostics.

Banaji will keynote and Nosek will speak at the 2014 APS Annual Convention*, to be held May 22–25, in San Francisco, CA, USA.*

Stereotype Threat

Over the last two decades, psychology has expanded far beyond studying the causes of prejudice and stereotypes, to the actual experience of people who are the focus of those biases. This spawned the study of stereotype threat. When people are confronted with negative stereotypes about one of their group identities (e.g., age, social class, race, gender, religion, etc.) they can feel a distracting bandwidth-consuming pressure not to confirm the stereotype, or not to be judged by it, which can, in turn, undermine performance in the immediate situation and even deter one from persisting in areas where this stereotype-driven pressure applies. APS Past Board member Claude M. Steele of Columbia University and his colleagues developed this field, performing some of the first experiments on stereotype threat in the mid-1990s. Steele, Steven Spencer of the University of Waterloo, and APS Fellow Joshua Aronson of New York University found, for example, that the forms of stereotype threat that women can experience in quantitative fields and that African Americans can experience in academic fields more generally can interfere with these groups' performance and comfort in these areas. Since then, stereotype threat has become one of the most widely studied topics in social psychology. Psychologists have found stereotype threat to be a potential contributing factor to such phenomena as gender gaps in business acumen and age differences in memory tasks.

Steele will be a speaker at the 2014 APS Annual Convention, to be held May 22–25, in San Francisco, CA, USA.

Human-Computer Interaction

The World Wide Web revolution was still years off in 1988. But within a very short time, the new field of human-computer interaction (HCI) — which melds cognitive, behavioral, and computer sciences — was focusing increasingly on the Internet's effect on individuals and groups. Topics that scientists have explored include online relationships, addiction to multiplayer games, behavior in online social networks, and cyberbullying. Recent research has produced such findings as a link between social networking use and narcissism, and the effectiveness of virtual reality in treating post-traumatic stress disorder.

Among the leaders in cyberpsychology science are Giuseppe Riva (Universitá Cattolica del Sacro Cuore, Milan), APS Charter Member Kent Norman (University of Maryland, College Park), and Stéphane Bouchard (University of Quebec in Outaouais).

Cyberpsychology's profile stands to rise with advances such as distributed computing, new input techniques such as voice and gesture commands, and the increased portability of technological devices and applications. What's more, the field is integrating with more disciplines on an international basis. The International Association of Cyberpsychology, Training, and Rehabilitation brings together top researchers with clinicians and policymakers to help apply technology to healthcare. At the Royal College of Surgeons Institute of Leadership in Ireland, psychologist and research fellow Mary Aiken has developed the Cyberpsychology Research Centre, which will incorporate work from institutions ranging from Massachusetts Institute of Technology to INTERPOL. The Centre's research will initially focus on the key areas of child safety online and cyberbullying, while developing partnerships between academia, government, law enforcement, and industry.

The Science of Terrorism

While scholars may have been examining the mindset of ideological radicals for decades, the 9/11 attacks forced the science of terrorism into the forefront of psychology. Among the leading psychologists in this arena is APS Fellow Arie Kruglanski, a psychology professor at University of Maryland, College Park. His survey research of people from around the world suggests that joining terrorist groups may give individuals a sense of security and meaning that they may be missing in their lives. With his colleague Michele Gelfand, also an APS Fellow, Kruglanski has assembled an interdisciplinary/international team of social scientists and computer science experts, developed a guiding conceptual network, and won a $4.5 million grant from the Department of Defense's Minerva Research Initiative to study the causes of radicalization as a first step toward reducing it. The work will include surveys and interviews with community samples, and with detained terrorism suspects in various terrorism-prone locations. Other psychologists involved in the project include Andrzej Nowak, head of the Center for Complex Systems at the University of Warsaw, APS Past President Douglas Medin (Northwestern University), APS Fellow Baruch Fischhoff (Carnegie Mellon University), and Jeremy Ginges (New School for Social Research).

Another prominent group of psychologists studying this topic includes APS Fellow Tom Pyszczynski, of the University of Colorado at Colorado Springs, Jeff Greenberg of the University of Arizona, and APS Fellow Sheldon Solomon of Skidmore College. Their research has been funded by the National Science Foundation since 1989. They have conducted research in collaboration with colleagues in the Middle East and Europe showing that existential threats often increase support for both terrorist violence and war, but that this violence-promoting effect can be curbed and sometimes reversed when compassionate values, a sense of shared humanity, or a sense of shared threat are salient. Pyszczynski, Greenberg, Solomon, and colleagues played a major role in the development of Experimental Existential Psychology, an emerging sub-discipline of social psychology that applies experimental methods to the study of human confrontation with existential problems such as death, freedom, isolation, and nature. In particular, their terror management theory has shed light on the role that the problem of death plays in diverse aspects of human behavior.

Modern Clinical Psychological Science

Historically, psychotherapists embraced their work as more of an art than a science. But over the last 25 years, researchers have built a large mountain of data about treatments that are the most effective at addressing psychological issues ranging from depression to post-traumatic stress disorder. In a March 2013 *Observer* article, APS James McKeen Cattell Fellow Scott O. Lilienfeld, Emory University, said that the science-practice gap remains too wide, noting that many practitioners still regard the emphasis on empirically supported therapies (ESTs) as unduly restricting their freedom to make clinical judgments. But clinicians have been facing heightened demands for accountability, not only by scientists but by health-care insurers and policymakers.

Over the years, APS and its members have led a variety of efforts to bridge the gap between science and practice. These initiatives have included the development of a science-based alliance of training programs (the Academy of Psychological Clinical Science); stronger ties to other scientific disciplines, including neuroscience, psychiatry, epidemiology, and genetics; and the recent launch of a new integrative research journal, *Clinical Psychological Science* (*CPS*), which APS James McKeen Cattell Fellow Alan E. Kazdin, Yale University, is editing. It features cutting-edge research across a wide range of conceptual views, approaches, and topics. You may read a *CPS* editorial written by Kazdin about the journal's role in advancing new frontiers online.